January 22, 2015

Mr. Stephen Posner, Manager
State of Washington
Energy Facility Site Evaluation Council
P.O. Box 43172
Olympia, WA

Re: DEIS Tesoro Savage Vancouver Energy Project, Application No. 2013-01

Dear Mr. Posner:

The attached documents contain the comments of Vancouver Energy (Applicant) on the Draft Environmental Impact Statement (DEIS) for our proposed crude oil rail-marine terminal transloading facility (Facility). We recognize and appreciate the significant amount of effort that EFSEC staff and its consultant team put into preparing this document for public review and comment. We believe that many portions of the DEIS are very well done, complete and accurate. Once all public comments have been collected and considered, the Final EIS (FEIS) will provide the EFSEC council with a valuable assessment of the project, its benefits and impacts, the extensive safety and mitigation measures that have already been incorporated into project design and operations, and what additional mitigation measures might be appropriate to include in any site certificate recommendation. We generally concur in what we understand to be an important general conclusion of the DEIS—that the Facility itself, under normal operations, has been designed or can be mitigated to have no probable significant adverse impacts. We are confident the seismic ground improvements at the Facility that are discussed in the DEIS can be refined to address EFSEC's consultant's questions. Further, when Facility noise and air emissions are compared against adopted standards, we believe those elements fall below applicable standards, and thus do not pose a significant, unavoidable impact from Facility construction or operations.

We would like to explain briefly the reason for the significant volume of comments we have included. We are using this comment letter to provide many of the corrections and clarifications we did not have an opportunity to deliver during EFSEC's preparation of the DEIS. In addition, we have tried not just to point out what we believe to be errors or places in the DEIS where we believe the corrections or clarifications are necessary, but also to propose actual language or attach additional detail and analysis from our team of project consultants, in order to assist EFSEC in preparing the FEIS. In a few cases we have also been working on some refined project analysis, which we are including as attachment to this letter. We hope this information will assist EFSEC and its consultant team as they prepare the FEIS.

Ex5504-000326-CRK

You will notice that, in our comments on Chapter 2, 3, 4 and 5, in particular, we have included a detailed explanation of what we believe are several errors in the DEIS's overall approach to assessing impacts. Those carry through much of the specific impact and mitigation discussion throughout Chapters 3 and 4. We can summarize these key flaws in approach as follows:

1. The four-tier ranking methodology used to rate the significance of the impacts is not consistent with the specific definition of "significant" impact in SEPA because it does not include any component of likelihood and because as applied, the DEIS concludes "significant" even for impacts that, under this ranking methodology, are identified as minor or moderate. SEPA defines a "significant" impact as one with a "reasonable likelihood" of "more than" a moderate effect. This error in ranking methodology leads to errors or overstatements regarding the significance of impacts throughout Chapters 3 and 4.

2. The Risk Assessment Discussion in Chapter 4 fails to incorporate the likelihood or probability of the incident in its conclusions regarding the significance of the impact. Because risk discussions and the related impact conclusions should properly consider likelihood as well as consequence, this omission results in overstatement of the significance of many of the impacts described in Chapter 4.

3. The rail and vessel transportation impacts from the No-Action Alternative are not carried through most of the discussion in Chapter 3 and are entirely missing from Chapter 4. There are two important characteristics of the No Action Alternative that are not adequately addressed in the DEIS. First, Chapter 2 nominally recognizes that the demand for mid-continent North American crude supply to West Coast refineries is expected to continue under the No Action Alternative and that crude oil will continue to be transported using the same existing transportation network, including the BNSF rail line and the Columbia River corridors that are evaluated in detail in this DEIS. The DEIS should consider that fact when comparing the Proposed Action against the No-Action Alternative. Second, the No-Action Alternative discussion should recognize that historic and projected volumes of rail and marine traffic have increased and decreased over time, due to a variety of factors. As such, the number of train trips or marine vessel transits attributed to the project falls within that historic and projected variation in freight traffic generally. For both of these reasons, impacts related to crude oil cargo specifically, or impacts unrelated to crude oil cargo, but related to rail and vessel traffic generally should be recognized as similar with or without the project. This is an important alternative comparison that is required by SEPA and lacking in the DEIS.

4. The DEIS does not recognize mitigation measures that have been proposed by the Applicant or designed into the facility (which were designed by the Applicant to reduce the likelihood of

> serious events to "improbable"), and includes as "mitigation" various government actions over which the applicant has no control or ability to implement. The discussion of mitigation must include what has been proposed by the Applicant and should not include government policy or regulatory recommendations that cannot be implemented by the Applicant or imposed on the Project specifically.

These errors are found throughout the document. Our attached comments contain a more complete explanation of the factual and legal problems with this approach. Additionally, we have attempted to flag more summarily, but repeatedly throughout the document the sections where the specific examples of these errors occur. However, our attempt to identify each instance should not be considered absolute and we urge EFSEC to instruct its EIS consultant to complete its own careful assessment of all statements throughout the document that should be revised or eliminated when these errors are corrected.

The Applicant is urged in several areas of the DEIS to reassess or evaluate alternatives to better address potential impacts or improve the clarity or effectiveness of the Facility design. We are eager to have discussions with EFSEC and its agency and consultant team at your earliest convenience to provide requested information and facilitate any necessary reassessment or refinements to the project design. We firmly believe these discussions will enable us to reach full understanding and agreement on the best approach. We will contact you in the near future to schedule appropriate follow up discussions on each of the items identified in the DEIS.

Thank you for your hard work on this document to date, and for your careful consideration of the comments that follow.

Sincerely,

Kelly Flint

Kelly Flint

cc: Jared Larrabee, Tesoro Savage Petroleum Terminal LLC
Jay Derr, Van Ness Feldman
Irina Makarow, BergerABAM

COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR VANCOUVER ENERGY

EXECUTIVE SUMMARY

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General Comments

The comments in this section address issues that are unique to the Executive Summary. Where the Executive Summary merely repeats or summarizes issues in other chapters, we have reserved our comments for those subsequent substantive chapters. To the extent those errors or issues explained in subsequent sections of this letter are repeated in the Executive Summary, we request Energy Facility Site Evaluation Council (EFSEC) to address the concerns and issues in both locations.

Section 2, Summary of the Vancouver Energy Distribution Terminal Project, page ES-4, paragraph 1

The following text should be corrected as indicated below, and other similar inconsistencies addressed throughout the Environmental Impact Statement (EIS) to properly identify vessel sizes.

> *According to the Applicant, approximately 80 percent of the marine vessels expected to call at the proposed Facility would be in the 46 ~~million~~* thousand *deadweight tons (~~M~~DWT) size range.*

Section 2, Summary of the Vancouver Energy Distribution Terminal Project, page ES-4, paragraph 2

The DEIS states:

> *It should be noted that the Applicant (Tesoro Savage Petroleum Terminal LLC) would not source or own any crude oil, nor arrange for rail transportation of crude oil to the proposed Facility, or for marine vessel transportation of crude oil from the proposed Facility.*

Although the statement accurately states that Vancouver Energy will not *arrange* for marine vessel transportation of crude oil, the Draft EIS (DEIS) does not recognize in the Executive Summary or elsewhere that Vancouver Energy will vet vessels prior to arrival to ensure only vessels meeting Tesoro's Vetting and Safety Standards will be accepted.

Section 4, Alternatives Considered

Section 4.1, The No Action Alternative, page ES-6, paragraph 1

The No Action Alternative fails to identify that the demand for crude oil by West Coast refineries would continue to be met by vessel transportation. The description of the No Action Alternative should be revised as follows:

> *Under the No Action Alternative, the current* and future *demand by West Coast refineries for mid-continent North American crude oil would continue. This demand would require continued transport of crude oil by existing transportation modes (including pipelines, tanker trucks,* marine vessels, *and rail) from sources to refineries or from sources to new or expanded crude-by-rail terminal in other West Coast locations.*

Furthermore, throughout the rest of the document, discussion of the No Action Alternative is limited to whether an alternative industrial facility is constructed on the site, without discussion of impacts from supplying continued demand to West Coast refineries. As such, the DEIS fails to recognize some of the most significant impacts from the No Action Alternative, and thus fails to make an adequate comparison with the Proposed Action, as required by the State Environmental Policy Act (SEPA). [WAC 197-11-440(5)(b)(vi) ("Present a comparison of the environmental impacts of the reasonable alternatives, and include the No Action Alternative.")] Discussion should be added in each section of Chapters 3, 4, and 5 addressing impacts from continued transport of mid-continent North American crude to West Coast refineries via existing alternative transportation modes.

Please also refer to comments in Section 2.8.2.5.

Section 6, Potential Environmental Impacts, page ES-8, first full paragraph

EFSEC should revise the framework of assessing impacts as *"negligible," "minor," moderate,"* or *"major"* to align with SEPA requirements. See the detailed comments submitted in reference to Section 3.0.3.

Section 6.2.2, Rail Transportation, page ES-9, paragraph 6

The second paragraph of this section should identify that Class 1 railroads have historically implemented system improvements to accommodate rail capacity issues, as described specifically in Section 5.1.3.2 of the DEIS.

Section 6.2.3, Vessel Transportation, page ES-10, paragraph 4

The Executive Summary should define the meaning of *"vessel-trip"* for those readers who will not read the remainder of the document. The difference between *"vessel trips," "vessel transits,"* and *"vessel calls"* should also be defined elsewhere in the EIS as appropriate, as these terms are not always correctly used. See the comment in Section 5.15.3.

Section 7, Special Studies

Section 7.1.2, Rail Corridor, page ES-13, paragraph 1

The DEIS should point out that the Proposed Action is not modifying any rail transportation corridor, and thus the Proposed Action is not creating a hazard or impact that does not already exist on these existing rail corridors. The purported rail corridor hazards or risks described in the DEIS would be applicable to existing and new rail traffic regardless of commodity.

Section 7.1.3, Vessel Corridor, pages ES-13 to ES-14

With regard to seismic hazards on the vessel corridor, the same recognition should be included in description of impacts related to vessel traffic as for the rail corridor. The Proposed Action is not modifying the vessel corridor and thus the Proposed Action is not creating a hazard that does not already exist. See response to Section 7.1.2 above.

Section 8, Potential Crude Oil Releases

Section 8.1, Potential Crude Oil Releases and Associated Environmental Impacts, page ES-16, paragraph 2

In paragraph 2, the DEIS correctly states that for a fire or explosion, the impacts to the environmental resources would depend on the adequacy of response plans; the extent of the fire or explosion; the physical, temporal, and environmental factors affecting the environment; and the level of response to the incident. However, for purposes of analysis in the DEIS, it is important to accurately define the potential scope of a fire or "*large explosion*." Despite the fact that in common language the term "*explosio*n" is used to describe a wide range of events, the DEIS must accurately define the kind of "*explosions*" that are associated with crude oil in order to properly judge the necessary safety and emergency response considerations. This will be covered further in our comments on Chapter 4.

Section 8.2, Additional Mitigation Measures to Address the Risks of and Impacts from a Crude Oil Spill, Fire, and/or Explosion, page ES-16, paragraph 1

The DEIS contains a cross reference to Section 4.1.3. The DEIS does not contain a Section 4.1.3.

Section 8.2.3, Mitigation Measures Involving EFSEC, the Applicant, and Other Agencies and/or Private Organizations, page ES-18

As described in more detail in comments to Section 3.0.4 of the DEIS, many of the mitigation measures summarized in this section identify actions that could only be performed by parties other than the Applicant, relate to activities (especially rail and marine vessel transport) beyond the transportation associated with the Proposed Action and identify possible policy actions over which the Applicant has no control. For that reason, these should not be identified as project mitigation, and should not form the basis of conditions to be included in the EFSEC recommendation for site certification.

Tables ES-2 and ES-3

Table ES-2, Summary of Environmental Impacts, Mitigation, and Significant Unavoidable Impacts of the Proposed Project, pages ES-23 to ES 42

Sections of the Executive Summary, including Table ES-2 and Section 3.0.4, fail to identify all of the mitigation measures proposed by the Applicant. This is inconsistent with SEPA

requirements and is a significant flaw in the DEIS because it prevents the public and decision makers from being informed of the myriad of measures that will be implemented by the Applicant to mitigate impacts identified in the DEIS. This flaw is discussed in more detail in our comments to Section 3.0.4. Table ES-2 should be revised to identify mitigation measures proposed by the Applicant so that the public reviewing the DEIS (and decision makers relying on the document) can fully understand the breadth of mitigation measures proposed by the Applicant, as well as the additional mitigation measures summarized in this table.

The table presented in Attachment ES-1 to this comment letter provides a summary of the mitigation measures required by regulation, standard, code, etc., as well as those voluntarily proposed by the Applicant that were presented in the Preliminary DEIS (PDEIS) and additional submittals to EFSEC in response to DEIS data requests. The Final EIS (FEIS) should include this table in the Executive Summary. The EIS should also identify Applicant-proposed mitigation measures that exceed regulatory or industry standard requirements.

Table ES-2 Summary of Environmental Impacts, Mitigation, and Significant Unavoidable Impacts of the Proposed Project, and Table ES-3 Summary of Potential Environmental Impacts from a Crude Oil Spill, Fire, and/or Explosion, pages ES-23 to ES-54

There are multiple inconsistencies regarding the level of impact conclusions and mitigation measures proposed by EFSEC presented in Tables ES-2 and ES-3 versus the information presented in the body of the DEIS.

For example, the DEIS identifies as a significant unavoidable adverse impact:

> *Impacts from a rail accident (e.g., collision) would depend on the unique circumstance of the event and may include, but would not necessarily result in, injuries or fatalities, which are considered to be moderate to major impacts. (Executive Summary Table Only)*

This impact is identified in the Executive Summary table but not in the text of Section 3.8.6. Further, the table omits a number of impact conclusions cited in the body of the DEIS. Given that some members of the public may only read the Executive Summary, this leaves the public lacking information in these areas. The FEIS should ensure consistency between the Executive Summary and the text of the DEIS for all significant adverse unavoidable impacts and mitigation measures. The summary tables should include entries for all impacts. The table presented in Attachment ES-2 to this comment letter presents a summary of the inconsistencies and omissions identified, but may not be fully inclusive.

Consistency in conclusions regarding impacts across the EIS should take into consideration the comments presented in Chapters 3, 4, and 5 where the Applicant provides information in support of a different conclusion.

COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR VANCOUVER ENERGY

CHAPTER 1: PROJECT BACKGROUND AND PURPOSE AND NEED

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Section 1.6, OBJECTIVES INCLUDING PURPOSE AND NEED TO WHICH THE PROPOSAL IS RESPONDING, page 1-5

The Environmental Impact Statement (EIS) should include some additional discussion regarding the market demand for petroleum products from the PADD 5 refineries on the West Coast, to further explain what the No Action Alternative properly assumes that the associated demand for crude oil will continue, and is important to national energy security. The Preliminary Draft EIS (DEIS) included discussion of this background in Section 1.3. That information should be summarized and included in the Final EIS to help the decision makers understand the underlying demand basis for the Proposed Action's purpose and objectives.

Section 1.6, OBJECTIVES INCLUDING PURPOSE AND NEED TO WHICH THE PROPOSAL IS RESPONDING, page 1-5, paragraph 1

The objective of the Proposed Action is to respond to both current and future demand of West Coast refineries. The following statement should, therefore, be revised as indicated:

> *The proposed Facility is intended to serve the current and future growing demand of West Coast refineries for mid-continent crude oil.*

Section 1.8: EFSEC PUBLIC INFORMATION MEETING AND DRAFT EIS COMMENT PERIOD AND PUBLIC MEETINGS

Section 1.8, EFSEC PUBLIC INFORMATION MEETING AND DRAFT EIS COMMENT PERIOD AND PUBLIC MEETINGS, page 1-7, paragraph 1

The EIS should be updated to reflect the extended comment period.

> *This Draft EIS ~~is available for public review now~~ was issued for public comment on November 24, 2015. ~~The comment period on the Draft EIS will extend through January 8, 2016.~~ The comment period began on November 24, 2015 and was scheduled to end on January 8, 2016. The Applicant, Tesoro Savage Petroleum Terminal LLC, agreed to extend the comment period through January 22, 2016. Public comment hearings ~~for this~~ on the Draft EIS ~~will be held during the public comment period.~~ were conducted as follows:*
>
> - *January 5, 2016, Clark County Event Center at the Fairgrounds, Ridgefield, WA*
> - *January 12, 2016, Clark County Event Center at the Fairgrounds, Ridgefield, WA*
> - *January 14, 2016, CenterPlace Regional Event Center, Spokane Valley, WA*

Section 1.8.2, Applicant Meetings and Consultation, pages 1-7 and 1-8, paragraph 5

Since submittal of the Preliminary DEIS, the Applicant has continued to meet and communicate with agencies, tribes, the public, and nongovernmental organizations. The list presented in Section 1.8.2 of the DEIS has been updated to reflect a representation of additional groups that the Applicant has met with (many of which the Applicant has met with on multiple occasions), and these additions should be reflected in the EIS:

- *Local Agencies (elected representatives or staff): City of Vancouver, Clark County, and Port of Vancouver, City of Ridgefield, City of Camas, Port of Camas-Washougal, Port of Ridgefield, City of Spokane , City of Spokane Valley, Vancouver Fire Department*
- *State Agencies: Washington State Department of Archaeology and Historic Preservation (DAHP), Washington Department of Commerce, and Ecology*
- *Federal Agencies: US Army Corps of Engineers (USACE), U.S. Fish and Wildlife Service and National Marine Fisheries Service (NMFS)*
- *Tribal Governments: Cowlitz Indian Tribe, Confederated Tribes of the Grand Ronde, Chinook Nation, Chehalis Tribe, and Yakama Nation*
- *Nongovernmental Organizations: Sierra Club, Audubon Club, Friends of Clark County, Pacific Northwest Waterways Association, Columbia River Pilots, Columbia River Steamship Operators' Association, Maritime Fire and Safety Association (MFSA and F-PAAC), Hispanic Community Public Affairs Liaison, Kiwanis Club Cascade Park, YWCA Clark County, Red Cross, Columbia Springs, Police Activities League (PAL), Clark County Skill Center, Clark College, Foundation for Vancouver Public Schools*
- *Neighborhood and Community Associations: Fruit Valley Neighborhood Association, Neighborhood Association Council of Clark County, Vancouver Neighborhood Alliance, Arnada Neighborhood Association, Esther Short Neighborhood Association, Harney Heights Neighborhood Association, Hough Neighborhood Association, Hudson's Bay Neighborhood Association, Maplewood Neighborhood Association, Northwest Neighborhood Association, Shumway Neighborhood Association, Vancouver Heights Neighborhood Association, Wildwood Neighborhood Association, Riverview Neighborhood Association, Columbia Way Neighborhood Association, East Old Evergreen Highway/Old Evergreen Highway Neighborhood Association, Evergreen Highlands Neighborhood Association, South Cliff Neighborhood Association, Bella Vista and Lewis and Clark Neighborhood Associations, Evergreen Shores Neighborhood Association, Carter Park Neighborhood Association, and Village at Fisher's Landing Neighborhood Association, Vancouver Metro Sunset Rotary, Vancouver Sunrise Rotary Club, Rotary Club of Camas-Washougal, Rotary Club of Greater Clark County, Rotary Club of Vancouver, City Club of Portland*
- *Businesses and Economic Development Organizations: Gramor Development, Hi-School Pharmacy, Columbia River Economic Development Council, Identity Clark County, Washington Council on International Trade, Greater Vancouver Chamber of Commerce, East Vancouver Business Association, Hazel Dell/Salmon Creek Business Association, Vancouver's Downtown Association, and Columbia Corridor Association, Association of Washington Businesses, Southwest Washington Labor Council, Washington Association of General Contractors, Vancouver Executives, Greater Spokane Inc., Spokane Valley Chamber of Commerce, Greater Portland Inc., Washington State Council of Fire Fighters, Southwest Washington Contractors Association*

COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR VANCOUVER ENERGY

CHAPTER 2: PROPOSED ACTION AND ALTERNATIVES

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Sections 2.1, Introduction, and 2.2, Description of the Proposed Action

The description of the Proposed Action and alternatives provided in the Draft Environmental Impact Statement (DEIS) contains inaccuracies in its description of the Facility.

The following table presents information found in the DEIS, which requires updating to accurately reflect the proposed action as presented by the Applicant in the Preliminary DEIS (PDEIS) and subsequent submittals to Energy Facility Site Evaluation Council (EFSEC).

DEIS Section, Page, and Paragraph	DEIS Text	Corrected Text/Comment
S2.1, p2-1, paragraph 2	The crude oil would be delivered to the proposed Facility by rail in "unit trains" composed of up to 120 sole-purpose crude oil tank cars.	Revise text as follows: The crude oil would be delivered to the proposed Facility by rail in "unit trains" composed of up to ~~120~~ 100 to 118 sole-purpose crude oil tank cars, with two buffer cars and three locomotives. (see PDEIS, page 2-12)
S2.1, p2-1, bullet 2	Each unit train would consist of 120 tank cars	Revise text as follows: Each unit train would consist of ~~120~~ 100 to 118 tank cars (PDEIS, page 2-12)
S2.1, p2-1, bullet 4	Each unit train would deliver 90,000 bbl of crude oil	Revise text as follows: Each unit train would deliver 65,000 to 90,000 bbl of crude oil (see PDEIS, page 2-12)
S2.1, p2-1, bullet 5	Up to three trains could be unloaded at the same time	Although the rail unloading building has three parallel tracks, entrance and departure track configurations require that three trains must be indexed through the Facility in a staggered order. At maximum, a total of 90 railcars (30 railcars each from three different trains) could be unloaded at the same time depending on arrival, departure, and indexing. Revise text as follows: Up to ~~three trains~~ three (3) trains could be unloading at the same time or 90 tank cars (30 railcars each from three different trains) could be unloaded at the same time. (see PDEIS, page 2-12)

DEIS Section, Page, and Paragraph	DEIS Text	Corrected Text/Comment
S2.1, p2-2, paragraph 2	Once a loaded unit train arrives at the proposed Facility, the crude oil would be unloaded from the railcars and either pumped directly to marine vessels at modified berths on the Columbia River or pumped through a network of transfer pipelines to a storage area containing six aboveground storage tanks. During marine vessel loading, the crude oil would be transferred via pipeline and associated hoses to a modified existing marine terminal on the Columbia River. The marine vessels would then transit down the Columbia River and across open ocean to marine facilities capable of offloading the crude oil for delivery to receiving refineries.	Revise text as follows: Once a loaded unit train arrives at the proposed Facility, the crude oil would be unloaded from the railcars and either pumped directly to a marine vessel~~s~~ at ~~modified~~ Berth~~s~~ 13 on the Columbia River or pumped through a network of transfer pipelines to a storage area containing six aboveground storage tanks. During marine vessel loading, the crude oil would be transferred via pipeline ~~and associated hoses~~ to a modified existing marine terminal on the Columbia River. Crude oil will be loaded onto vessels through welded steel pipelines installed along the berth trestle and flexible loading hoses connecting the welded steel pipeline to the vessel manifold. The marine vessels would then transit down the Columbia River and across open ocean to marine facilities capable of offloading the crude oil for delivery to receiving refineries. (see PDEIS, page 2-1)
S2.2.1, p2-3, paragraph 2	The proposed Facility would be constructed and operated on a site that was previously used for intensive industrial purposes dating back to the 1940s when Evergreen Aluminum LLC and Aluminum Company of America (Alcoa) first developed the site for aluminum smelting operations. Berths 13 and 14 were constructed in the early 1990s.	Only a portion of the site is developed on the footprint of the former Alcoa Plant, specifically, all of Areas 200 and 600, and the western portion of Area 500 are located at the former Alcoa site. Area 300 is located on a site that was purchased by the Port for laydown and industrial activities. This area was not part of the Alcoa facility. The Marine Terminal area, as well as Berths 13 and 14, were developed in the 1990s for short- and long-term moorage of oceangoing governmental and commercial vessels. This area was also not part of operations of the Alcoa plant. Revise text as follows: The proposed Facility would be constructed and operated on multiple sites located at the Port of Vancouver.

DEIS Section, Page, and Paragraph	DEIS Text	Corrected Text/Comment
		The rail unloading, offices, boiler building, and portions of the transfer pipelines are located at a site that was previously used for intensive industrial purposes dating back to the 1940s when Evergreen Aluminum LLC and Aluminum Company of America (Alcoa) first developed the site for aluminum smelting operations. The storage tanks, marine terminal, and remaining portions of the transfer pipelines will be located on sites (not associated with the Alcoa facility) that were developed by the Port for industrial activities. Berths 13 and 14 were constructed in the early 1990s for short- and long-term moorage of oceangoing vessels. (see PDEIS, Section 2.2.2)
S2.2.1, p2-3, paragraph 3	In 2009, the Port purchased the land that now makes up Terminals 4 and 5.	Revise text as follows: In 2009, the Port purchased the land that now makes up Terminal~~s 4 and~~ 5. Terminal 4 was developed prior to 2009 and includes Areas 300, 400, and portions of Area 500. (see PDEIS, Section 2.2.2)
S2.2.1, p2-5, paragraph 3	At Terminal 4, Subaru Auto and other tenants lease Port property between the proposed storage area (Area 300) and Berths 13 and 14 (Area 400). Other tenants currently leasing Port property adjacent to the proposed Facility include NGL Supply Terminal Co., Kelly Steel, Farwest Steel, and CalPortland. Properties adjacent to the proposed Facility that are not owned by the Port include the Clark County Jail Work Center (JWC) and the Clark Public Utilities (CPU) River Road Generating Plant.	Revise text as follows: At Terminal 4, Subaru Auto and other tenants lease Port property between the proposed storage area (Area 300) and Berths 13 and 14 (Area 400). Other tenants currently leasing Port property adjacent to the proposed Facility include NGL Supply Terminal Co., Kelly Steel, ~~Farwest Steel,~~ and CalPortland. Properties adjacent to the proposed Facility that are not owned by the Port include the Clark County Jail Work Center (JWC), Farwest Steel, and the Clark Public Utilities (CPU) River Road Generating Plant. The Clark County Sherriff Marine Patrol Unit operates a boat house adjacent to the marine terminal. (see PDEIS, Section 2.2.2)
S2.2.2, p2-6, Table 2-1	Line Item: Onsite Rail Infrastructure Includes rail infrastructure consisting of two additional rail loop tracks to be	Revise text as follows: Includes rail infrastructure consisting of two ~~additional~~ existing rail loop tracks

DEIS Section, Page, and Paragraph	DEIS Text	Corrected Text/Comment
	added to existing Port rail infrastructure.	that will be used exclusively by the Facility. ~~to be added to existing Port rail infrastructure.~~ (see Project Refinement Report)
S2.2.2, p2-6, Table 2-1	Line Item: Administrative and Support Buildings (Area 200) Includes three approximately 3,400-square-foot office buildings that would house administrative functions, lockers, restrooms, and other employee support facilities	Add the following text as follows: Parking for employees and visitors will also be located in this area, as well as the containment tanks for the rail unloading facility. (see PDEIS, Figure 2.2-4, Project Refinement Report)
S2.2.2, p2-6, Table 2-1	Line Item: Railcar Unloading Facility (Area 200) Includes support buildings, parking, rail access to the railcar unloading facility, and the railcar unloading facility	Revise text as follows: Includes support buildings~~, parking~~, rail access to the railcar unloading facility, and the railcar unloading facility. (see PDEIS, Figure 2.2-4)
S2.2.2, p2-6, Table 2-1	Line Item: Marine Terminal (Area 400) Includes product conveyance and loading facilities located on the dock at Port Berths 13 and 14, the marine vapor combustion units, emergency containment and response equipment, and control and ancillary facilities associated with vessel loading	Revise text as follows for additional clarity: Includes product conveyance and loading facilities located on the dock at Port Berth~~s~~ 13 ~~and 14~~, ~~the marine vapor combustion units~~, booming equipment, emergency containment, and response equipment located on the dock at Port Berth 14, mooring equipment, the marine vapor combustion units and control and ancillary facilities associated with vessel loading.
	Line Item: Boiler Building (Area 600) Houses two primary electrically powered boilers and one standby natural gas–fired boiler to provide steam for the heating of tank cars during unloading of crude oil; area includes the piping facilities to carry generated steam to the railcar unloading area	Revise text as follows: Houses two primary ~~electrically powered~~ natural gas-fired boilers and one standby natural gas-fired boiler to provide steam for the heating of tank cars during unloading of crude oil; area includes the piping facilities to carry generated steam to the railcar unloading area (see PDEIS, page 2-28)
S2.2.2.2, p2-10, paragraph 1	These buildings would be located on the northern side of the Terminal 5 loop south of an existing private road.	Revise text as follows: These buildings would be located on the northern side of the Terminal 5 loop

DEIS Section, Page, and Paragraph	DEIS Text	Corrected Text/Comment
	Parking and landscaping would be provided.	south of an existing private road. Parking and landscaping would be provided. Additionally, the two (2) containment tanks connected to the rail unloading facility are located adjacent to the parking lot. (see PDEIS, Figure 2.2-4, Project Refinement Report)
S2.2.2.2, p2-10, paragraph 2	Four additional pedestrian bridges would be constructed for workers to pass over the unit trains inside the railcar unloading facility and also to provide worker egress from the rail loop system.	Revise text as follows: Four additional pedestrian bridges would be constructed for workers to pass over the unit trains inside the railcar unloading facility and also to provide worker egress from the rail l~~oop system~~ unloading building. Pedestrian bridges cross over the interior rail loop track to provide egress from the Facility to the interior of the Terminal 5 rail loop. (see PDEIS, page 2-16)
S2.2.2.3, p2-10, paragraph 2	Each collection pipe header would be directly connected to a dedicated pumping station that would transfer crude oil into a 24-inch-diameter transfer pipeline.	Revise text as follows: Each collection pipe header would be directly connected to a dedicated pumping station that would transfer crude oil into a 24-inch-diameter transfer pipeline dedicated for that track. Each of the three (3) rail unloading tracks contains six (6) tank car unloading stations that drain through collection headers to one of five (5) dedicated pumping stations. The pumping stations for each track discharge into a dedicated 24-inch-diameter transfer pipeline. (see PDEIS, page 2-16) The railcar unloading facility would be approximately 1,850 feet long and 91 feet wide with a maximum height of approximately ~~50~~ 38.5 feet. Add paragraph as follows: The pumps are housed in pump basins beneath the rail unloading structure. Each of the five (5) pump basins serving Tracks 4106 and 4107 would measure approximately 16 feet wide by 55 feet long by 15 feet deep. The five (5) pump basins serving Track 4105

DEIS Section, Page, and Paragraph	DEIS Text	Corrected Text/Comment
		would measure approximately 16 feet wide by 51 feet long by 15 feet deep. Two (2) pumps would serve each unloading header with one serving as the primary pump and the second serving as an online standby pump. During pumping, crude oil would not come into contact with the vaults; however, the pump basins would serve as secondary containment. Trenches and pump basins would be constructed of concrete, coated with sealant, and treated with chemical-resistant joint sealant. The trenches would be designed to be watertight using a water stop at the concrete joints to prevent groundwater from entering the trench and to contain water collected within the trench. (see PDEIS, page 2-16, Engineering Drawings 0200-GA-015, and 0200-GA-016)
	Although the primary purpose of the trenches is to house the collection pipe headers, the stormwater and inadvertent release collection line, and electrical and data lines, the trenches would also provide secondary containment in the event of a crude oil release during unloading.	Revise text as follows: Although the primary purpose of the trenches is to house the collection pipe headers, the stormwater and inadvertent release collection line, and electrical and data lines, the trenches and pump basins would also provide secondary containment in the event of a crude oil release during unloading. (see PDEIS, page 2-16)
S2.2.2.3, p2-17, bullet 1	Collection pans between rails would be piped to a separate line that conveys stormwater and inadvertent releases to railcar unloading facility containment tanks (also known as holding tanks).	Revise text as follows: Collection pans between the rails and concrete floor of the facility would be piped to a separate line that conveys stormwater and inadvertent releases to railcar unloading facility containment tanks located at the Administrative and Support Areas (also known as holding tanks). (see PDEIS, page 2-14, Project Refinement Report, Operations Stormwater Pollution Prevention Plan)
S2.2.2.3, p2-17, bullet 2; sentence 3	The tanks would be constructed of steel, covered, and anchored in accordance with applicable seismic design requirements.	Revise text as follows: The tanks would be double walled, constructed of steel, ~~covered,~~ and anchored in accordance with applicable

DEIS Section, Page, and Paragraph	DEIS Text	Corrected Text/Comment
		seismic design requirements. (Project Refinement Memo, Operations Stormwater Pollution Prevention Plan)
S2.2.2.3, p2-17, bullet 2; last sentence	If a discharge to these tanks occurred, the contents of the tanks would be removed by vacuum trucks and disposed at an approved offsite location licensed to handle spilled oil.	Revise text as follows: If a discharge to these tanks occurred, the contents of the tanks would be removed by vacuum trucks and disposed of or recycled at an approved ~~offsite~~ off-site location licensed to handle spilled oil. (see PDEIS, page 2-17)
S2.2.2.3, p2-17, bullet 3; sentence 3	The pump basins would measure approximately 58 by 58 square feet and would be 12 feet deep. Trenches and pump basins would be constructed of concrete, coated with sealant, and treated with chemical-resistant joint sealant.	Sizing of pump basins for Tracks 4106 and 4107 were presented in the PDEIS as 16 feet wide and 51 feet long x 15 feet deep and for track 4105 would measure 16 feet wide x 55 feet long x 15 feet deep (see PDEIS, Page 2-16). Revise text as follows: The five (5) pump basins for non-heated crude Tracks 4106 and 4107 would measure approximately ~~58 by 58 square feet~~ 55 by 16 feet and would be ~~12~~ approximately 15 feet deep. The five (5) pump basins for heated crude Track 4105 would measure approximately 51 by 16 feet and would be approximately 15 feet deep. Trenches and pump basins would be constructed of concrete, coated with sealant, and treated with chemical-resistant joint sealant.
S2.2.2.3, p2-17, subsection E-Houses and Control Systems	The tank car unloading process would be controlled from six electrical houses (E-houses), enclosures specifically built to protect critical electrical equipment. These E-houses would be approximately 825 square feet with a maximum height of 15 feet and would be pad-mounted on 225-square-foot pads. The E-houses would be constructed adjacent to the railcar unloading facility. The tank car unloading primary control system and the primary control system managing the flow of crude oil from the railcar	Revise text as follows: The tank car unloading process would be controlled from a combination control room and electrical house (E-house), which would be approximately 450 square feet mounted on an approximately 600-square-foot concrete pad. Five (5) additional ~~six electrical houses (~~E-houses~~)~~, enclosures specifically built to protect critical electrical equipment, will be constructed along the south side of the rail unloading building. These E-houses

DEIS Section, Page, and Paragraph	DEIS Text	Corrected Text/Comment
	unloading facility to the storage tanks would also be located in these E-houses.	would be approximately ~~825~~325 square feet with a maximum height of 15 feet and would be pad-mounted on ~~225~~375-square-foot pads. The E-houses would be constructed adjacent to the railcar unloading facility. The tank car unloading primary control system and the primary control system managing the flow of crude oil from the railcar unloading facility to the storage tanks is located in the combination control room/E-house structure. Each of the other connected E-houses would provide monitoring capability and would be a 'slave' to the main controller. ~~would also be located in these E-houses.~~ (see Operations SWPPP Appendix A)
S2.2.2.4, p2-18, paragraph 1, sentence 4	The storage tanks would be approximately 50 feet in height and 240 feet in diameter. The networking capacity of the storage tanks would be approximately 340,000 bbl per tank, with an additional 20,000 bbl as a minimum operating volume that would remain in the concave bottom of the tank.	Revise text as follows for additional clarity: The storage tank would be approximately 50 feet in height and 240 feet in diameter with a shell capacity of 380,000 bbl. The networking capacity of the storage tanks would be approximately 340,000 bbl per tank, with an additional 20,000 to 30,000 bbl as a minimum operating volume that would remain in the ~~concave~~ convex bottom of the tank. An additional 10,000 bbl of shell capacity is included above the operational fill level for overfill protection equipment and is not available for storage volume.
S2.2.2.4, p2-21, paragraph 2	A fire pump house and foam building would contain an emergency fire pump and fire protection systems for storage operations. A small storage tank of 500 gallons or less would be located adjacent to the emergency fire pump to hold ultralow sulfur diesel fuel used to fuel the fire pump. The fire foam building would have a footprint of approximately 180 square feet; the fire pump house would have a footprint of approximately 750 square feet and would be single-story.	Revise text as follows: A combined fire pump ~~house~~ and foam building would contain an emergency fire pump and fire protection systems for storage operations. A small storage tank of 500 gallons or less would be located adjacent to the emergency fire pump to hold ultralow sulfur diesel fuel used to fuel the fire pump. The combined fire pump and foam building would have a footprint of approximately ~~180~~ 750 square feet~~; the fire pump house would have a footprint of~~

DEIS Section, Page, and Paragraph	DEIS Text	Corrected Text/Comment
		~~approximately 750 square feet~~ and would be single-story. (see Operations SWPPP Appendix A; and Operations Facility Safety Program Drawing 0200-LS-003, page 67)
S2.2.2.5, p2-22, paragraph 1, sentence 1	The proposed marine terminal would consist of two modified access trestles and two modified T-shaped docks that form two berthing locations (Berths 13 and 14) with associated marine vessel mooring elements.	Revised text as follows: The proposed marine terminal would consist of two modified access trestles and two modified T-shaped docks that form a single berth location ~~two berthing locations~~ (Berths 13 and 14) with associated marine vessel mooring elements. Vessel loading equipment is located on Berth 13, and Berth 14 is being used as a mooring point and launch location for pre-booming operations. (see PDEIS page 2-24)
S2.2.2.5, p2-22, paragraph 1, sentence 4	A mechanically operated 5-ton 30-foot-high crane would be installed at Berth 14 along with a workboat cradle (with trailer) for storage of an aluminum skiff.	Revise text as follows: A mechanically operated ~~11 ton 5-ton 30-foot-high~~ crane would be installed at Berth 14 along with a workboat cradle (with trailer) for storage of an aluminum skiff. The crane will be designed to lift the approximately 7,000-pound workboat used for pre-booming operations. Initial design indicates that no structural modifications will be required to the piles or concrete deck of Berth 14.
S2.2.2.5, p2-24, bullet 4	Addition of a new movable walkway between two mooring dolphins and the shoreline.	Revise text as follows: Addition of ~~a new~~ two (2) new movable walkways between two mooring dolphins and the shoreline.
S2.2.2.5, p2-24, subsection E-Houses and Control Systems	The transfer of crude oil to the marine vessel loading facility would be controlled from a control room housed within a single-story E-house located adjacent to the marine terminal. The E-house would have a footprint of approximately 1,250 square feet. This system would control the flow of crude oil from the storage tanks to the marine loading system. Separate fire suppression control and gas detection	Revise text as follows: The transfer of crude oil to the marine vessel loading facility would be controlled from a control room housed within a 1,250-square-foot ~~single~~ two-story E-house located adjacent to the marine terminal. The E-house would have a footprint of approximately ~~1,250~~ 625 square feet. This system would control the flow of crude oil from the storage tanks to the marine loading

DEIS Section, Page, and Paragraph	DEIS Text	Corrected Text/Comment
	systems would be provided at the marine terminal.	system. Separate fire suppression control and gas detection systems would be provided at the marine terminal. (see Operations SWPPP Appendix A and Operations Facility Safety Program Drawing 0400-LS-002, page 75)
S2.2.2.5, p2-24, subsection Fire Protection Systems, paragraph 2, sentence 1	A fire hydrant would also be located near the marine terminal.	As a result of the ground improvement work proposed within the Marine Terminal the existing municipal water system will need to be replaced. All work will be conducted in accordance with City of Vancouver requirements. The following edit reflects the replacement of two existing fire hydrants located on the north side of the access drive. Revise text as follows: Two (2) upland ~~A~~ fire hydrants would also be ~~located~~ replaced near the marine terminal.
S2.2.2.6, p2-25, subsection Fire Protection Systems	New fire hydrants would be installed in the vicinity of the pipeline alignment to augment the water supply available from existing fire hydrants in the vicinity of the transfer pipelines (Area 500).	Revise text as follows for additional clarity: New fire hydrants are proposed along the south side of the rail unloading building at 300-foot intervals. Two (2) hydrants are located at the Marine Terminal, and additional hydrants are proposed at the top of the containment berm at the storage area. ~~would be installed in the vicinity of the pipeline alignment to augment the water supply available from existing fire hydrants in the vicinity of the transfer pipelines (Area 500)~~.
S2.2.2.7, p2-27, paragraph 1, sentence 3	Natural gas would be supplied to the building from an upgraded existing natural gas pipeline serving the area.	Information presented in the PDEIS and Project Refinement report indicating that there is an existing service to the West Boiler is inaccurate. Further coordination with NW Natural yielded information that the existing service was abandoned. Therefore, a new 4-inch service line would be constructed to serve the west boiler building from the existing service line in NW Old Lower River Road. There are

DEIS Section, Page, and Paragraph	DEIS Text	Corrected Text/Comment
		no additional environmental impacts as a result of the change from replacement of a service line to a new service line. Revise text as follows: Natural gas would be supplied to the building from a new service line and connection from the existing natural gas line located in NW Old Lower River Road.~~an upgraded existing natural gas pipeline serving the area~~.
S2.2.2.7, p2-27, paragraph 2, last sentence	Boiler blowdown water would be cooled to reduce its temperature below 140°F and then would be pumped to the unloading and office area (Area 200), where it would be treated with an oil-water separator and mixed with domestic wastewater from the administration buildings prior to discharge to the existing Terminal 5 sanitary sewer system.	Revise text as follows: Boiler blowdown water would be cooled to reduce its temperature below 140°F and then would be pumped to the unloading and office area (Area 200), where it would be treated with an oil-water separator and mixed with domestic wastewater from the administration buildings prior to discharge to the ~~existing Terminal 5 sanitary sewer system.~~ City's sanitary sewer collection system located in Old Lower River Road. (see PDEIS, page 2-28)
S2.3.1, p2-27, bullet 4	Two of the three railcar unloading structures at the railcar unloading facility, including foundations, trenches, pump basins, catwalks/gangways, and piping necessary to support operations for two unloading tracks (tracks 4106 and 4107).	Revise text as follows: Two of the three railcar unloading ~~structures~~ racks at the railcar unloading facility, including foundations, trenches, pump basins, catwalks/gangways, and piping necessary to support operations for two unloading tracks (tracks 4106 and 4107). Foundations, trenches, pump basins, and underground piping for track 4105 could be installed with Phase 1. (see PDEIS Section 2.3.1.12)
S2.3.1, p2-28, bullet 2	Facilities to capture, treat, and convey stormwater associated with four of the six storage tanks.	The following edits allows for flexibility to construct portions of the stormwater capture, conveyance, and treatment systems for the last two tanks with the first phase of construction. Changing the sequence of construction does not impact the environmental analysis.

DEIS Section, Page, and Paragraph	DEIS Text	Corrected Text/Comment
		Revise text as follows: Facilities to capture, treat, and convey stormwater associated with four of the six storage tanks. Portions of the stormwater system for the last two tanks could be installed with Phase 1.
S2.3.1, p2-28, bullet 10	The third railcar unloading structure at the railcar unloading facility, including trenches, pump basins, catwalks/gangways, and piping necessary to support operations for one unloading track (track 4105), with the ability to handle heated crude oil.	Revise text as follows: The third railcar unloading rack ~~structure~~ at the railcar unloading facility, including trenches, pump basins, catwalks/gangways, and piping necessary to support operations for one unloading track (track 4105), with the ability to handle heated crude oil. The underground trenches, pump basins, and buried mechanical piping could be installed with Phase 1. (see PDEIS Section 2.3.1.12)
S2.3.2.1, p2-30, Table 2-3	Table 2-3, Construction Best Management Practices by Proposed Facility Element	This table should be deleted in its entirety and a reference to the submitted construction Stormwater Pollution Prevention Plan in the appendix should be added. (see Construction Stormwater Pollution Prevention Plan, BergerABAM 2015)
S2.3.2.5, p2-33, paragraph 1, sentence 6	At the completion of the testing process, the hydrostatic test water would be analyzed and treated to comply with the NPDES Industrial Construction Stormwater Permit and NPDES Construction Stormwater Permit before discharge to the stormwater system.	Revise text as follows for additional clarity: At the completion of the testing process, the hydrostatic test water would be analyzed and treated to comply with the NPDES ~~Industrial~~ Construction Stormwater Permit ~~and NPDES Construction Stormwater Permit~~ before discharge to the stormwater system.(description clarification)
S2.3.3.5, p2-35, paragraph 1, second to the last sentence	The Applicant submitted an application to the USACE on February 12, 2014, describing seismic and safety upgrades, installation of concrete anchors to existing steel piles, minor configuration modifications to existing mooring facilities, and installation of a	Revise text as follows for additional clarity: The Applicant submitted an application to the USACE on February 12, 2014, describing seismic and safety upgrades at Berths 13 and 14, including installation of concrete anchors to existing steel piles, minor configuration

DEIS Section, Page, and Paragraph	DEIS Text	Corrected Text/Comment
	transfer pipeline on one of the mooring facility piers (Berth 14) (USACE 2015).	modifications to existing mooring facilities, and installation of a transfer pipeline on one of the mooring facility piers (~~Berth 14~~Berth 13) (USACE 2015).
S2.3.4.5, p2-37, Figure 2-14	Figure 2-14, Site Plan for the Marine Terminal	Replace site plan for marine terminal with updated site plan as submitted to EFSEC in Project Refinement Report, or in Appendix A of Operations SWPPP.
S2.3.3.5, p2-40, last paragraph, sentence 2	This construction would include the installation of piping, jib cranes, a movable gangway, an observation and control platform, a dock safety unit, pipe trays, lights on the Berth 13 trestle and dock, and installation of on-deck infrastructure (e.g., a hanging fendering system, bollards, handrails, and a retractable walkway).	Revise text as follows: This construction would include the installation of piping, jib cranes, a movable gangway, an observation ~~and control platform~~ station, a dock safety unit, pipe trays, lights on the Berth 13 trestle and dock, and installation of on-deck infrastructure (e.g., a hanging fendering system, bollards, handrails, and a retractable walkway). The observation and control platform is located in the MCC/E-House located upland.
S2.3.3.5, p2-41, paragraph 2, last sentence	Water for mixing the grout would be sourced from the City of Vancouver.	Revise text as follows: Water for mixing the grout would be sourced from the City of Vancouver or the Port of Vancouver. (see PDEIS, page 2-59)
S2.3.3.5, p2-41, Sequencing paragraph	Sequencing. The first row of jet grout columns landward of the temporary sheet pile wall would be installed first to act as a barrier to potential grout migration during the installation of subsequent jet grout columns landward of the OHWM. This would reduce the potential for later grout installations to migrate through seams in the wall, or under the wall, toward the Columbia River.	The applicant suggests an additional mitigation measure that directs the jet grout upland during the installation of the first row of jet grout columns adjacent to the OHWM. Revise text as follows: Sequencing. The first row of jet grout columns landward of the temporary sheet pile wall would be installed first to act as a barrier to potential grout migration during the installation of subsequent jet grout columns landward of the OHWM. The first row of jet grout columns would be installed as a half-circle with the jet grout only on the landward side of the bore hole to limit

DEIS Section, Page, and Paragraph	DEIS Text	Corrected Text/Comment
		grout/pH migration. This would reduce the potential for later grout installations to migrate through seams in the wall, or under the wall, toward the Columbia River.
S2.3.3.6, p2-45, paragraph 1, sentence 2	The prefabricated pipe segments used to construct the transfer pipelines would be delivered to the site prior to pipeline construction. Supports for the aboveground transfer pipeline segments would consist of piles or stone column-supported concrete foundations. Pipe segments would be installed and welded together in the field.	Revise text as follows: The prefabricated pipe segments used to construct the transfer pipelines would be delivered to the site prior to pipeline construction. Supports for the aboveground transfer pipeline segments would consist of piles, spread footings, jet grout column-supported or stone column-supported concrete foundations. Pipe segments would be installed and welded together in the field. (see PDEIS, page 2-19, Project Refinement Memo)
S2.3.3.6. p2-45, bullet 2	Transfer pipelines and the associated pumping systems would be equipped with flow and pressure sensors to identify pipeline or pump failures. Pressure relief valves would be included on the pipeline and pump to avoid overpressure situations.	Revise text as follows: Transfer pipelines and the associated pumping systems would be equipped with flow and pressure sensors to identify pipeline or pump failures. Internal ~~P~~pressure relief valves would be included on the pipeline and pump to avoid overpressure situations.
S2.3.3.6, p2-45, bullet 3	Transfer pipelines would be equipped with manual and automatic isolation valves at the exit and entrance to the railcar unloading area, the storage tank area, and the marine vessel loading area. These valves would include 30-second shutoff capabilities to stop the flow of product in the event of an anomalous flow and pressure condition related to an inadvertent release or in response to operations personnel triggering a shutoff.	Revise text as follows: Transfer pipelines would be equipped with manual and automatic isolation valves at the exit and entrance to the railcar unloading area, the storage tank area, and the marine vessel loading area. These valves would include 30-second shutoff capabilities to stop the flow of product in the event of an anomalous flow**,** seismic**,** and pressure condition related to an inadvertent release or in response to operations personnel triggering a shutoff.
S2.3.4.1, p2-46, paragraph 1, last sentence	In addition, the existing 2-inch service line to the boiler building would be upgraded to a 4-inch-diameter service line for natural gas supply at the boiler building.	Revise text as follows: In addition, the new ~~existing 2-inch service line to the boiler building would be upgraded to a~~ 4-inch-diameter service line for natural gas supply to ~~at~~

DEIS Section, Page, and Paragraph	DEIS Text	Corrected Text/Comment
		the boiler building will be constructed as part of the Facility.
S2.4.1.1, p2-46, paragraph 1	As described in Section 2.1, an average of four crude oil unit trains per day would arrive at the proposed Facility. Each unit train would include up to 120 tank cars, each with a crude oil capacity of up to 750 bbl, two buffer cars, and three locomotives.	Revise text as follows for consistency with ASC and PDEIS: As described in Section 2.1, an average of four crude oil unit trains per day would arrive at the proposed Facility. Each unit train would include approximately ~~120~~ 118 tank cars, each with a crude oil capacity of up to 750 bbl, two buffer cars, and three locomotives.
S2.4.1.2, p2-48, paragraph 6, last sentence	The dome hatch is not opened for unloading operations.	Revise the last sentence in paragraph 6 of Section 2.4.1.6 as follows: Upon completion of transfer of crude oil, the operator would turn off the pump and valves, remove the hose, ~~rebolt the railcar dome hatch~~, and close and tighten the railcar bottom outlet cap.
S2.4.1.4; P2-49, paragraph 1	Each storage tank would have an operational crude oil storage capacity of approximately 340,000 bbl.	Tank volume clarified to include the shell capacity. Revise the text as follows: Each storage tank would have a shell capacity of approximately 380,000 bbl with an operational crude oil storage capacity of approximately 340,000 bbl.
S2.4.1.5; P2-49 paragraph 2,		Clarification that the vessels arriving at the Facility will be under control of the Columbia River Pilots. Add the following sentence to the beginning of the paragraph: Marine vessels calling upon the Facility will be piloted during transit from the Pacific Ocean through docking at the Facility by the Columbia River Bar Pilots and the Columbia River Pilots.
S2.4.1.6, p2-58, paragraph 4	The transfer pipelines would have a concrete basin equipped with a sump pump for dewatering and removing effluent and discharge. Effluent and	Revise text as follows: The pump basin for the transfer pipelines would have a concrete basin

DEIS Section, Page, and Paragraph	DEIS Text	Corrected Text/Comment
	discharge contained by the concrete basins would be transferred to a mobile vacuum truck and taken to an approved facility for recycling or disposal.	equipped with a sump pump for dewatering and removing effluent and discharge. Effluent and discharge contained ~~by~~in the concrete basins would be transferred to the containment tanks for temporary storage and to a mobile vacuum truck and taken to an approved facility for recycling or disposal. The concrete vaults where the transfer pipelines transition from abovegrade to belowgrade will be constructed watertight and include a sump and monitoring for the collection of fluids within the vaults. Any collected fluids in these vaults will be removed to a vacuum truck and taken to an approved facility for recycling or disposal. (See Operations Stormwater Pollution Prevention Plan, Appendix D6 to the DEIS)
S2.4.1.6, p2-58, paragraph 7	Natural gas service would be obtained from NW Natural. An existing 2-inch service line is in place for service to the boiler building (Area 600; Figure 2-20).	Revise text as follows: Natural gas service would be obtained from NW Natural. A new 4-inch service line and connection to the existing natural gas line will be constructed as part of the Facility. ~~An existing 2-inch service line is in place for service to the boiler building (Area 600; Figure 2-20).~~ Figure 2-20 shows the location of an existing 10-inch-diameter natural gas service line for the CPU Generating Station. A portion of this service line will be relocated as discussed in Section 2.3.4.1.
S2.4.1.6, p2-60, paragraph 3	In the event of a power failure for any reason, leased portable power generators (i.e., emergency engines) would be activated to operate critical safety, security, and environmental equipment. The emergency engines would be fueled by ultralow sulfur diesel or biodiesel.	Revise text as follows: In the event of a power failure for any reason, leased portable power generators (i.e., emergency engines) would be ~~activated~~ delivered to the site, connected, and started up to operate critical safety, security, and environmental equipment. Emergency engines will not be stored on site. The emergency engines would be fueled by ultralow sulfur diesel or biodiesel. Immediately following power failure transfer operations will be shut down

DEIS Section, Page, and Paragraph	DEIS Text	Corrected Text/Comment
		and battery powered systems will illuminate egress routes for personnel.
S2.4.3, p2-62, bullet 3	Security gating would be provided at the rail loop access at the Gateway overpass.	Revise text as follows: Security gating would be provided at the bottom of the rail loop access ramp ~~at~~ near the Gateway overpass.

Section 2.2: Description of the Proposed Action

Section 2.2.2.6, Transfer Pipelines (Area 500), page 2-25, paragraph 1 (partial)

The description of the transfer pipelines needs to include the following information.

Although some of these measures were identified in Chapter 4, they are integral to design elements aimed at spill prevention and must be described here. These design features are intended to specifically minimize the occurrence of transfer pipeline failures and resulting leaks:

All piping must be fully welded per U.S. Coast Guard regulations and industry standards. PDEIS, Section 2.3.1.4 states "*Piping would be installed and field welded. Field welds would be inspected per applicable specifications (API Specification 5L)*." See also Section 4.2.4.1 of the DEIS, page 4-6.

In addition, the design elements aimed at preventing discharges of oil during conveyance would include:

- Marine Terminal loading hoses and their supporting equipment would be designed to meet the applicable hose protection requirements of WAC 173-180 Part B and 33 CFR 156. (PDEIS page 4-321)
- All piping located over water would be welded and would not contain any mechanical joints. (PDEIS page 4-321)

Section 2.2.2.5, Marine Terminal (Area 400), page 2-24, paragraph 1

At the beginning of page 2-24, the DEIS discusses elements of the proposed dock modifications, including the "*optimal mooring configuration*." However, the bullets that follow the introductory sentence omit important information about the mooring configuration that provide additional protections for moored vessels and safety for employees handling the lines (Longshoremen).

The following language from PDEIS Section 2.2.2.10 (page 2-26) describes these measures and should be included in the EIS:

> *To provide an optimal, safe mooring configuration, two shore-based mooring points would be installed above the OHWM. Quick-release mooring hooks would be installed on a concrete base to handle mooring lines. New quick-release mooring hooks would be installed on all mooring points. The mooring system would incorporate a load monitoring system for the physical tensioning of the mooring lines so that they operate within optimum design limits while a vessel is berthed.*

Section 2.3: Facility Construction Activities

Section 2.3.2.2, Ground Improvements, pages 2-31 to -32, Table 2-4

Based on suggestions in the DEIS to reassess the seismic ground improvement design, the Applicant is actively evaluating design alternatives and accepts the DEIS recommendation that the Applicant's design team consult with EFSEC and the DEIS seismic consultants to evaluate various options to best address the need to provide adequate seismic protection and to minimize the risk to water quality from ground improvement activity. The Applicant believes that whatever alternative design might be selected after additional consultation with EFSEC and its seismic consultants would not pose impacts beyond the range of those already identified in the DEIS.

Overall, there would be no change in effects of the analysis or mitigation measures presented in the DEIS, or, with consideration of water quality, a potential net positive effect of alternative ground improvement designs.

Section 2.4: Operation and Maintenance Activities

Section 2.4.1.5, Vessel Docking and Loading, page 2-52, last paragraph

The DEIS misquotes and misinterprets the Safe and Effective Threshold Determination Report (SETDR). The SETDR is included as Attachment K to the Operations Oil Handling Manual, which is included in Appendix D to the DEIS. Section 4.4.1, page 21, of the SETDR states,

> *Based on Tesoro's years of experience at their nearby dock and data presented in previous sections of this document, the Facility expects surface current speed to exceed 1.0 knot on a frequent basis all months of the year and occasionally to exceed 3 to 5 knots during spring flood flows of the Columbia River. The Facility anticipates that current speed will be a deterrent to effective pre-booming at this terminal for a substantial portion of the year. Therefore, the effective threshold value for current speed will be 1.5 knots at this terminal.*

Although 1.0 knot is oftentimes considered an effective threshold, 1.5 knots was selected so that effective pre-booming would not be precluded a substantial portion of the year. Furthermore, Vancouver Energy has purchased two NOFI Harbour Busters© (see Attachment 2-1). The Harbour Busters are mobile containment booms that can withstand current speeds up to 3 knots, and include an integrated oil/water separator and storage tank (15 cubic meters gross,

approximately 5 cubic meters of net oil). These containment booms can be rapidly deployed and will be on standby during all marine transfer operations. These mobile containment booms will also be added to Table 4 of the Operations Oil Handling Manual, and Figure 7.2 of the Operations Oil Spill Contingency Plan in future revisions.

Section 2.4.4.1, Unit Train Arrival and Departure, page 2-47, paragraph 4

The DEIS statement regarding the Applicant's tank car commitments and obligations at page 2-47 may be subject to misinterpretation and should be corrected as follows:

> *According to the Applicant, all tank cars used to transport crude oil to the proposed Facility would ~~meet the new DOT-117 tank car standards to reduce vulnerability to breaching or failure during derailments~~* follow the requirements of the new US DOT / PHMSA Tank Car rule Final Rule on Enhanced Tank Car Standards and Rail Operational Controls for Flammable Liquid Transport, 80 Fed. Reg. 26644 (May 8, 2015), as modified by the Fixing America's Surface Transportation Act or ''FAST Act,'' H.R. 22, 114th Cong., Pub. L. No. 114-94 (Dec. 4, 2015) including the schedule for retiring DOT-117 specification tank cars to reduce vulnerability to breaching or failure during derailments (see Section 4.2.4.2 for details on DOT-117 tank cars).

The phase-in schedule for DOT-117 cars is identified in Section 4.2.4.2 of the DEIS. Although industry is on an expedited schedule to new build or upgrade the existing fleet to DOT-117 specification rail tank cars, the federal government has established a railcar turnover priority and requirements schedule to allow for an orderly transition with the best interests of both safety and commerce in mind. The Applicant is concerned with a different railcar requirement than the federal government's and other existing terminals in Washington State, which essentially creates an uneven playing field for industry and could put Vancouver Energy at a severe commercial disadvantage, even though other crude oil railcars are often transported much further through the state to terminals in northwest Washington. This comment also applies to the 3rd bullet of Section 4.9.2 of the DEIS.

Regardless of the phasing schedule required by federal law, the Applicant had previously committed[1] to not accept any crude oil at the proposed Facility that is transported in tank cars that do not at least meet the American Association of Railroads (AAR) Casualty Prevention Circular 1232 (CPC-1232) standard (issued on August 31, 2011 and went into effect on October 10, 2011).

Additionally, Tesoro, as a major customer of the Facility, has made the decision to only use DOT-117 or better tank cars for the volumes that it ships through the Facility. These tank cars

[1] February 6, 2014; Tesoro Upgrading Rail Car Fleet to Consist Entirely of Newer CPC-1232 Compliant Cars. Available at: http://phx.corporate-ir.net/phoenix.zhtml?c=79122&p=irol-newsArticle&ID=1897820. Accessed January 19, 2016.

will not contain any retrofitted CPC-1232s (i.e., DOT-117Rs). This commitment represents an acceleration of the federally mandated phasing schedule for DOT-117 tank cars.

Section 2.6: Rail Operations

Section 2.6: Rail Operations, page 2-64, paragraph 2 and following

The following statement should be reviewed as it may underestimate the total amount of crude oil loaded per day, unless the numbers refer to typical volumes loaded at single facilities:

> *Currently, 20 existing and proposed crude oil unit train loading terminals in North Dakota and Montana load between 10,000 and 200,000 bpd by facility of Bakken crude oil (North Dakota Pipeline Authority 2014, BNSF 2015):*

The DEIS should also be corrected to note that not all of the facilities in the bulleted list that follows the statement above only load unit trains. For example the Colt Hub at Epping provides various loading and unloading services[2]. The paragraph that follows on page 2-64 of the DEIS, should also be corrected as the facilities located on the east coast, in California, Oregon, and Washington receive and unload crude oil trains[3].

Section 2.6, Rail Operation, page 2-65, first full paragraph

Also, at page 2-65, the DEIS identifies two crude oil unit train loading facilities in Canada. There are in fact more such facilities than just those identified in the BNSF reference cited (CAPP, 2014)[4].

Section 2.7: Vessel Operations

Section 2.7, Vessel Operations, page 2-68, paragraph 1

Articulated tug barges (ATBs) are also self-propelled. Revise the DEIS text as follows:

> *Vessels arriving to load crude oil at the proposed Facility would likely be either self-propelled vessels (tankers) or articulated* and self-propelled *tug barges (ATBs).*

Further, there are no large oceangoing barges available for service on the West Coast. The largest vessels in use on the West Coast carry up to 185,000 barrels (bbl). Revise the DEIS as follows:

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[2] See: http://www.rangelandenergy.com/what. Accessed January 19, 2016.

[3] See for example see Section 1.3.7.2 of the PDEIS, Table 1.3-12 – all of the facilities listed in this table are designed to unload crude oil unit trains.

[4] CAPP 2014. Transporting Crude Oil by Rail in Canada. Canadian Association of Petroleum Producers. March 2014. Available at: http://www.capp.ca/~/media/capp/customer-portal/documents/242427.pdf. Accessed January 19, 2016.

ATBs consist of a tanker barge that is directly coupled to a tugboat that pushes the barge from a notch in the stern of the barge. Large oceangoing ATBs have cargo capacities of up to 327, 000 bbl of oil; however, none of these large vessels are available for service on the West Coast.

Section 2.7, Vessel Operation, page 2-69, paragraph 2

Both in this section, and in Appendix J, the DEIS incorrectly states the implications of a channel depth of 43 feet. As an example in DEIS Section 2.7, paragraph 2, page 2-69, the DEIS states:

> *Channel depths are maintained at 55 feet below mean lower low water (MLLW) over the bar and at 43 feet below MLLW from RM 3 to the approximate location of the proposed Facility. As a safety measure, pilots implement a 2-foot-underkeel clearance requirement for vessels navigating the channel, which allows for fully laden drafts up to 41 feet. However, occasionally the river levels run below MLLW, depending on the season and dam and lock operations upriver, and draft restrictions limiting vessels from becoming fully laden during that time are implemented. Vessels with a freshwater draft of less than 36 feet are generally able to transit the bar and river in acceptable weather conditions.*

The 43-foot depth of the channel is measured from a fixed datum point. The actual river level is sometimes below but is very often above the fixed datum point. Gauges located throughout the river corridor inform pilots of the actual water that is available, above or below the datum point. For example, when there is +2 feet of water on the gauges, the pilots are able to transit vessels with a full 43 feet of draft and still have 2 feet of under keel clearance. More than +2 feet on the river level gauges provides more underkeel clearance rather than opportunities for deeper drafts; 43 feet of draft is normally treated as the absolute limit regardless of the available water.

If river levels showed zero on the gauges, then the available water would be 43 feet, and pilots would be limited to transiting with vessels of 41 feet (with 2 feet of underkeel clearance). Seasonally, usually in the late summer and early autumn, there are times when river levels are below the datum point (negative readings on the gauges). In those situations, restrictions limit transits to drafts of less than 41 feet in an effort to assure a constant 2 feet of underkeel clearance. Vessels with drafts of 36 feet or less are able to transit without draft concerns throughout the year except in very unusual circumstances.

Section 2.7, Vessel Operations, page 2-68, paragraph 2

The largest vessels that carry crude oil from the Alaska pipeline terminal can navigate the Columbia River; however, the terminal will not be designed to accept them. The DEIS should be revised as follows:

> *The large "supertankers" that carry crude oil from the Alaska pipeline terminal to various West Coast refineries* can ~~*are too large to*~~ *navigate the Columbia River*; however, the terminal will not be designed to accept them.

Section 2.7, Vessel Operations, page 2-69, Table 2-11

In the DEIS Section 2.7, Table 2-11, remove the column for 125,000 MDWT under the Oil Tanker heading. There are only two such vessels in the world and the Applicant will not accept them at the proposed Facility.

Throughout the DEIS (including Appendix J), there is inconsistent use of a representative size for the "Aframax" class vessels. In some cases, the EIS uses 160,000 MDWT and in others 165,000 MDWT. A consistent value should be used throughout.

Section 2.7, Vessel Operations, page 2-70, paragraph 2

The following DEIS text is incorrect and should be corrected as indicated below.

> *ATBs are not required to use pilots but the largest ATBs often choose to use a pilot since the size of the tug-barge combination is equivalent to a medium-sized ship.*

The DEIS should be corrected to the following:

> ATBs of 10,000 gross tons and larger are required to use federally licensed pilots per 46 USC Chapter 37 and 46 CFR 15.812. These pilots are licensed by the state of Oregon as well. Vessels less than 10,000 gross tons must be under the direction and control of a person qualified to act as a pilot. All ATBs that will call to the Vancouver Energy Terminal will be under the direction and control of a federal- and state-licensed pilot.

Please see Attachment 2-2 to this letter.

Section 2.7, Vessel Operations, page 2-71, paragraph 3

DEIS Section 2.7, page 2-71, paragraph 3 is incorrect and should state,

> *Prior to arrival at the mouth of the Columbia River, vessels would be required to provide a ~~96-hour advanced notice to proposed Facility emergency contingency plan contractors~~* 96 hour notification provide information to USCG and pilots (Electronic notice of arrival – ENOA *and, additionally, would require a clearance for arrival from…*

DEIS Section 2.7, page 2-71, paragraph 3 is incorrect. EFSEC needs to contact Columbia River Pilots to obtain the correct language for the document and update the statement as needed.

> *Vessel traffic on the Columbia River is monitored through the Lower Columbia Vessel Traffic Information System (VTIS), which is used by pilots, vessel and tug operators, the US Army Corps of Engineers (USACE), and the USCG to collectively monitor vessel traffic, manage anchorages, and maintain awareness of current conditions (Columbia River Pilots 2014).*

Section 2.7.3, Delivery of Crude Oil by Vessel to Refineries, page 2-73, paragraph 1

The first paragraph of Section 2.7.3 correctly identifies that certain California refineries are unable to receive crude oil directly by vessel. However, these facilities can receive crude oil that

has been transshipped through the proposed Facility to a marine terminal elsewhere on the coast, and then transported by other means (pipeline or truck) to the refinery[5]. Even in the absence of the Proposed Action, these refineries are dependent on the existing terminal/pipeline/truck infrastructure to receive crude oil.

Section 2.7.3, Delivery of Crude Oil by Vessel to Refineries, page2-74, Table 2-13

Table 2-13 lists inland refineries that cannot directly receive crude oil by vessel. By only focusing on refineries that can receive crude oil by vessel, the DEIS underreports PADD 5 refineries that could receive oil trans-shipped through the proposed Facility. Table 2-13 also incorrectly lists refineries and ownership as described below.

The DEIS should either list all PADD 5 refineries, or should include a separate table of refineries that do not have a marine terminal to receive vessels, but which could otherwise receive crude oil trans-shipped through the proposed Facility as described above using a combination of marine and land-based transportation methods.

In addition, the following corrections should be made to Table 2-13:

- The entry for Paramount Petroleum Bakersfield in Table 2-13 should be removed, as this is an inland refinery and cannot receive marine vessels directly.

Under the first section of the table (Tesoro Refineries), the following corrections should be made:

- The first and forth rows should be corrected to note the owner is Tesoro Refining & Marketing Company LLC.
- The second and third rows of Table 2-13 should be merged, as they are a single refinery complex (Los Angeles refinery), consisting of the Wilmington and Carson operations. The owner of this refinery is Tesoro Refining & Marketing Company LLC.
- The fifth row should be deleted as Tesoro sold the Kapolei Refinery to Par Petroleum in September 2013.

Under the section "Other Refineries":

[5] Additional information about such terminals was presented in the Applicant's Preliminary Draft EIS at Section 1.3.5.2 and may be informative to the public in the context of EFSEC's DEIS: "Facilities for importing crude oil and refined products are available in 46 marine terminals in California, 39 of which are located in the two major refining centers in the San Francisco Bay area and Los Angeles. The other seven marine terminals, in San Diego, Ventura, and Humboldt counties, are not directly linked to refineries. These terminals are used to ship and receive products in areas that are not served by pipelines. The Port of Los Angeles, Port of Long Beach, and El Segundo Marine Terminal are the major terminals for marine import of crude oil into southern California. Currently, six terminals are located at the Port of Los Angeles, receiving 37 crude and petroleum products with greater than 5 MMbbl of storage capacity (Port of Los Angeles and USACE 2008)."

- The entries for Chevron USA, Honolulu and Chevron Kapolei refinery are duplicative of the single Chevron refinery located in Kapolei.

Section 2.8: Alternatives to the Proposed Action

The Applicant agrees with the DEIS discussion and conclusions regarding various action alternatives to the Proposal be discussed in the DEIS Sections 2.8.2.1, 2.8.2.2, 2.8.2.3, and 2.8.2.4 with a few minor suggested corrections described below.

Section 2.8.2.3, Alternative Site Locations, Figure 2-28 and Table 2-1 [sic]

Figure 2-28 and Table 2-1 [sic] incorrectly characterize the petroleum terminal facilities in Port Angeles, Washington. The terminal at Port Angeles only handles refined petroleum products, and does not receive crude oil at all, nor does it receive any petroleum products by pipeline (Larkins, 2015[6]).

Section 2.8.2.5, No Action Alternative, page 2-87

Section 2.8.2.5 defines the No Action Alternative to be analyzed throughout the DEIS, and correctly recognizes that crude oil demand from West Coast refineries will continue without the Proposed Action; therefore, crude oil will continue to be transported using existing modes of transportation (including pipelines, marine vessel, rail and tanker trucks) and will be used to supply that demand under the No Action Alternative. However, the DEIS fails to adequately characterize the No Action Alternative and carry it forward in its analysis of the various elements of the environment, by often only discussing impacts from alternative uses at the Facility site, without discussing purported impacts from this continued crude transportation. Significantly, the DEIS omits discussion of the No Action Alternative entirely from its discussion of the array of impacts discussed in Chapter 4 of the DEIS and thus the risks of fire, explosion, or spill from crude transportation under the No Action Alternative are inappropriately omitted from the document. This is a fundamental flaw. The No Action Alternative in the DEIS is rendered an inaccurate benchmark, and comparisons to the Project proposal do not accurately identify which impacts or portions of impacts are attributable to the Project.

In general, the No Action Alternative is typically defined as what is most likely to happen if the proposal did not occur, not what would happen if all current activities were also ceased or no future actions were taken at all.[7] This may include the continued use of the land that is currently ongoing or future actions that are not already taking place, but are likely to take place.[8]

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[6] Larkins, Joel. 2015. Personal communication to Irina Makarow, BergerABAM, regarding Port Angeles Terminal. December 9, 2015.

[7] SEPA Handbook § 3.3.2.1.

[8] *Id.* For example, if a rezone is proposed, the SEPA Handbook directs the lead agency to consider what is the most likely development on the site under existing zoning.

Although the lead agency has some discretion in defining the No Action Alternative, the development of the No Action Alternative is still governed by the rule of reason.[9] In the National Environment Policy Act (NEPA) context (which similarly requires the assessment of a No Action Alternative), guidance provides that "[w]here a choice of 'no action' by the agency would result in predictable actions by others, this consequence of the 'no action' alternative should be included in the analysis."[10] For example, "if denial of permission to build a railroad to a facility would lead to construction of a road and increased truck traffic, the EIS should analyze this consequence of the 'no action' alternative."[11] Under the rule of reason, agencies have properly delineated the No Action Alternative when they consider the likely actions that would occur if the proposed action did not go forward.[12] The No Action Alternative analysis would be rendered meaningless if the agency develops an inaccurate benchmark that ignores likely future actions.[13]

For example, purported impacts associated with train horn noise, wildlife-train collision mortality, and gate down-time delays occur with of any rail transportation activity and are not unique to rail transportation to the Proposed Action. As acknowledged in the DEIS, rail traffic generally and even unit train traffic specifically (e.g., grain and coal) already uses the system for other commodities and will continue to occur with or without the project and will continue to vary (up and down) from year to year, based on commodity demand unattributable to the Proposed Action. As indicated in Section 5.17.2.1 of the PDEIS, such gate down times already exist[14] and are being experienced by drivers arriving or stopped at at-grade crossings when existing individual trains pass.

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[9] *See Toandos Peninsula Ass'n v. Jefferson County*, 32 Wn. App. 473, 648 P.2d 448 (1982); *see also Nevada v. Dep't of Energy*, 457 F.3d 78, 93 (D.C. Cir. 2006) (quoting *Citizens Against Burlington, Inc. v. Busey*, 938 F.2d 190, 196–97 (D.C.Cir.1991)).

[10] 6 Fed.Reg. at 18027; *Hammond v. Norton*, 370 F. Supp. 2d 226, 241 (D.D.C. 2005); *Nashvillians Against I-440 v. Lewis*, 524 F. Supp. 962, 988 (M.D. Tenn. 1981); *Young v. General Services Admin*., 99 F.Supp.2d 59 (D.D.C. 2000).

[11] NEPA's 40 Most Asked Questions, *available at* https://ceq.doe.gov/nepa/regs/40/40p3.htm.

[12] *Oceana v. Bureau of Ocean Energy Mgmt*., 37 F. Supp. 3d 147, 172 (D.D.C. 2014) (finding that the agency had followed a rule of reason in determining that the no-action alternative (under which an oil and gas lease would be cancelled) would not significantly change the environment impact because if this particular lease sale did not go forward, another lease sale in the same area eventually would); *Young*, 99 F.Supp.2d 59 (no-action alternative was reasonable even though it took into account future likely development of the area in which the proposed action would have been located because a decision by the government not to consolidate its facilities on undeveloped land would result in significant private commercial and residential development on the vacant property); *Nashvillians Against I-440*, 524 F. Supp. at 988 (where a decision not to build a major highway will result in an outstanding need to improve existing city streets, the consequences of actions relieving that need should be addressed in the no-action alternative).

[13] *Nashvillians Against I-440*, 524 F. Supp. at 989.

[14] PDEIS Section 5.17.2.1, at footnote 12: "The length of a crude oil unit train is not significantly different from the length of other types of freight trains (for example grain). Unit trains typically consist of 112 to

With respect to vessel wake effects, although the DEIS greatly overstates impacts from wake (see for example comments to Sections 3.3.3.3 and 3.4.3.3), whatever effects occur from wake will continue in the No Action Alternative with other vessel traffic. The DEIS acknowledges that the increase in project-related vessel transits is minor, yet concludes that the existing impact is already "moderate." Thus, any impacts that may appropriately be attributed to vessel wakes would be similar when comparing the Proposed Action with the No Action Alternative.

Even the concerns discussed in the DEIS over impacts specific to the commodity being transported fail to adequately take into account that other entities will continue to use and likely increase the use of the railway corridor to transport crude oil to meet the current demand of West Coast refineries for mid-continent North American crude oil.[15] Although Section 2.8.2.5 specifically addresses that West Coast demand "….*would require continued transport of crude oil by existing transportation modes (including pipelines, tanker trucks, and rail) from sources to refineries, or from sources to new or expanded crude-by-rail terminals in other West Coast locations…*", at no point does the DEIS analyze the impacts of this portion of the No Action Alternative. Given the substantial consideration of transportation impacts in the DEIS, EFSEC should at a minimum assess how crude oil transportation to West Coast refineries may occur in the absence of the Facility and what impacts this might have especially in Washington and the Columbia River. For example, in the absence of development of Vancouver Energy, additional smaller proposals may be brought forward to capture the market share the Proposed Action would have satisfied. As evidenced by the number of other crude by rail proposals either being reviewed or implemented in Washington, it is undeniable that the geographic location of Washington State respective to existing rail and vessel transportation infrastructure will continue the be an important factor in siting such facilities. On the other hand, if such facilities cannot be sited in Washington, crude oil may still be transported through Washington, through the Columbia River gorge, and on the Columbia River as a result of the location of existing infrastructure. Each of these outcomes has impacts that EFSEC should consider, especially in terms of the statewide policy implications articulated in RCW 80.50.010.

In summary, the failure to adequately define the No Action Alternative and the additional failure to compare the No Action Alternative to the Project proposal results in an inaccurate overstatement of the Project's impacts that must be corrected. In order for the DEIS to comply with the requirements of WAC 197-11-440(5)(b)(ii) and WAC 197-11-440(5)(c)(vi), the EIS should specifically include in the definition of the No Action Alternative the vessel and rail traffic impacts, if any, likely to occur in the absence of the project, including the specific ongoing and increasing levels of crude by rail to existing refineries and planned marine terminals; evaluate the impacts of the No Action Alternative throughout the DEIS, including Chapter 4; and for

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150 cars (BNSF 2014b); manifest trains or intermodal trains can also be 7,800 to 10,000 feet long (Clark 2010). Therefore, the delays experienced at crossings from other freight trains would be almost the same as those experienced for trains serving the Proposed Action."

[15] DEIS § 2.8.2.5.

each element of the environment, evaluate the impacts of the No Action Alternative in the context of its full definition.

Section 2.9: Benefits or Disadvantages of Reserving Project Approval for a Later Date

Section 2.9, Benefits or Disadvantages of Reserving Project Approval for a Later Date, page 2-88, paragraph 2

As with the flaw in the No Action Alternative discussed in the section immediately above, this section describing the purported benefits or disadvantages of reserving the project application approval for a later date offers a false comparison to overstate any benefit from delaying project approval. The section correctly acknowledges that "*West Coast refineries would continue to source crude oil from existing mid-continent supply locations to replace declining supplies from California and Alaska*," and also notes that those deliveries would "*continue to be transported to receiving refineries by rail*." However, the DEIS nevertheless assumes that remote risk of spill impacts during transport would be minimized by project delay because of the extra time for implementation of regulatory systems governing rail transportation. This is an inaccurate comparison with the No Action Alternative. The remote risks of spill or accident would be the same under either scenario because, as acknowledged by the DEIS, rail and vessel deliveries would continue on the same rail routes without the changes to the regulatory regime. Additionally, if the proposed Facility decision, including the state-of-the-art design and all of the mitigation measures incorporated into that design and added through the EFSEC Site Certificate Agreement conditions is delayed, then crude will continue to be transported through the state to existing facilities that may or may not incorporate those measures. (Ice, 2015[16])

As discussed in the comment to Section 5.18, in the absence of the Proposed Action being implemented, crude oil would continue to be sourced by West Coast refineries using existing transportation methods. This would include continued reliance on foreign crude oils, or domestic crude oils which may have a higher comparative lifecycle Carbon intensity.

Section 2.10: Areas of Controversy and Uncertainty, page 2-88, first paragraph (partial)

The DEIS characterizes concerns over volatility of crude oils as an area of "uncertainty." However, the characteristics of crude oil can be quantitatively addressed. See our comment on volatility in Section 4.5.1.1.

The DEIS also characterizes the risk of explosion at the project site or along transportation routes as areas of "uncertainty." In the second paragraph of this section, the DEIS states "*because the frequency and severity of an actual spill, explosion, or fire in the future cannot be predicted, such*

[16] Ice, Carl R. 2015. Letter to Honorable John, Thune, Chairman, Committee on Commerce, Science and Transportation, September 9, 2015. Available at: https://domino.bnsf.com/website/updates.nsf/e647066efb76e3d386256c31005423dd/d445acd9b967f5d786257ebb0049d848/$FILE/09-09-2015%20BNSF%20PTC%20Response.pdf

analysis involves an unavoidable degree of uncertainty." However, and as discussed in greater detail in Chapter 4, there are enough known factors to enable the DEIS to establish an anticipated worst-case or planning standard event. It is simply not true that the severity of an explosion or fire cannot be predicted.

The DEIS statement on uncertainty regarding the actual performance of the new or retrofitted DOT-117 tank cars should be deleted because it fails to acknowledge the comprehensive rule-making and analysis that US DOT (including Federal Railroad Administration [FRA] and the Pipeline Hazardous Materials Safety Administration) has completed before arriving at the conclusion that this standard is the most appropriate for transporting crude oil and ethanol, and that will within time be used for all other Hazard Class 3 Flammable Liquids. The adopted DOT-117 standard incorporates tank car design elements that have been used for transport of other more flammable and more hazardous materials, and there is well-proven statistical modeling available (which information was provided to the US DOT by industry, such as the Association of American Railroads) based on numerous actual incidents to very accurately predict and quantitatively show how the DOT-117 standard reduces the probability of crude oil being released or spilled in the event of a derailment. Furthermore, the DEIS should acknowledge the ongoing DOT-117 performance review that is being done as part of the Railway Supply Institute—Association of American Railroads Safety Project, as more of these railcars are put into service.

In addition, the Applicant's understanding is that the BNSF crude oil unit train that derailed near Culbertson, Montana, in July 2015 had a mix of CPC-1232 railcars and also near-equivalent DOT-117 railcars (but for one small appendage, and so at the time were not yet called DOT-117s). Our understanding is that the statistical model did predict actual results reasonably well; moreover our understanding is that the near-equivalent DOT-117 railcars performed excellently in the unfortunate real-world test. The FRA has not yet published the results of their investigation. However, we recommend that EFSEC speak directly with the FRA about the Culbertson, Montana, derailment and railcar performance in it.

COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR VANCOUVER ENERGY

CHAPTER 3: AFFECTED ENVIRONMENT, IMPACTS, AND MITIGATION MEASURES

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Section 3.0 Introduction

Section 3.0.3, Environmental Impacts, page 3.0-2

In classifying the level of environment impacts the Draft Environmental Impact Statement (DEIS) uses a four-level rating system as follows:

> *This Draft EIS uses the following four-level rating method to describe the magnitude, duration, and degree of potential environmental impacts (see Figure 3.0-1).*

There are two errors with this fundamental framework:

1. The Energy Facility Site Evaluation Council (EFSEC) Should Revise The Framework Of Negligible Minor, Moderate And Major Impacts To Align With the State Environmental Policy Act (SEPA).

The DEIS uses a framework that is both confusing and inconsistent with SEPA to identify purportedly significant impacts. The DEIS categorizes impacts into those that are negligible, minor, moderate and major. The DEIS suggests that moderate and major impacts are significant, but then applies that rationale inconsistently. Both the fundamental framework and its inconsistent application in the DEIS are inconsistent with SEPA and any efforts to exercise substantive SEPA authority on those grounds would be unauthorized.

In the DEIS the fundamental *four-tier* framework is unclear and contrary to SEPA. SEPA requires analysis of significant impacts, and defines significant as a reasonable likelihood of more than a moderate adverse impact on environmental quality. Significance involves both context and intensity, and intensity depends both on magnitude and duration.[1] The four-tiered approach in the DEIS is inconsistent with that framework.

For example, it is unclear what EFSEC means by the term major." The term major is not used in SEPA. Although the DEIS provides its own definition of major[2] this definition does not align with the definition of significant used by SEPA. Perhaps more importantly, the DEIS incorrectly includes *moderate impacts* as *significant unavoidable impacts*. Specifically, the DEIS provides that significant unavoidable impacts are those impacts that remain *moderate* or *major* in magnitude, duration, or degree, even after all mitigation measures have been applied. Including moderate impacts as significant impacts is directly inconsistent with WAC 197-11-794, which provides that impacts must result in ***more than a moderate adverse*** impact on the environment to be considered significant. For this reasons, moderate impacts are not properly classified as significant under SEPA.

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[1] WAC 194-11-794.

[2] The DEIS defines "major impacts" as "[i]mpacts of high intensity and/or of long-term or permanent duration, of localized or regional extent, and/or that affect culturally important, ecologically important, or unique/rare resources."

The DEIS compounds these flaws by applying its framework inconsistently. While the four-tiered system nominally classifies only moderate and major impacts as purportedly significant, in some cases, EFSEC considers even minor impacts to be unavoidable significant impacts. For example, Section 3.3.6 lists the *minor to moderate* impacts of vessel wakes as significant unavoidable adverse impacts. Similarly, section 3.5.6 lists the *minor to moderate* impacts of wildlife collision mortality and barrier effects from project-related rail traffic as *significant unavoidable adverse impacts*. To the extent that these passages (and other similar passages identified throughout the comment letter) purport to classify even minor impacts as significant, they are inconsistent with the framework set out in the DEIS and is also clearly at odds with SEPA. Any efforts to exercise substantive SEPA authority to address those purported impacts would be unauthorized.

2. The Draft Environmental Impact Statement Fails to Adequately Consider the Likelihood of an Impact When Determining Whether it is Significant.

The impact rating method used to describe impacts does not include a measure of likelihood or frequency which is required by the SEPA definition of significant[3]. Under SEPA, an EIS is only required to analyze "***probable*** significant, adverse environmental impact[s] (emphasis added)."[4] The definition of probable for purposes of SEPA is "'likely or reasonably likely to occur…" Probable is used to distinguish likely impacts from those that merely have a possibility of occurring, but are remote or speculative.[5] This is also reflected in the definition of significant which means "a ***reasonable probability*** of more than a moderate effect on the quality of the environment." [6] In applying the probable standard, the Washington Supreme Court has found that remote consequences need not be included in an EIS. [7]

This requirement to consider the likelihood of an event, "is not meant as a strict statistical probability test"[8] and "does not lend itself to a formula or quantifiable test."[9] SEPA even gives some flexibility to consider an impact whose "chance of occurrence is not great, but the resulting environmental impact would be severe if it occurred."[10] However, this general flexibility and recognition that there is not one simple threshold does not authorize agencies to declare those impacts that are improbable and remote to be significant.

[3] WAC 197-11-794
[4] RCW 43.21C.03; see also WAC 197-11-402.
[5] WAC 197-11-782.
[6] WAC 197-11-794 (emphasis added).
[7] *Cheney v. Mountlake Terrace*, 87 Wash.2d 338, 344 (1976) ("SEPA does not require that "every remote and speculative consequence of an action be included in the EIS" and the "adequacy of an EIS must be judged by application of the rule of reason."). *See also West 514, Inc. v. County of Spokane*, 770 P.2d 1065 (1989) (supplemental EIS was not required because the plaintiff did not establish the probability or likelihood of blight resulting from the proposal).
[8] WAC 197-11-782.
[9] WAC 197-11-794.
[10] WAC 197-11-794.

In many instances, particularly the discussion in Chapter 4, the DEIS violates this basic SEPA premise by characterizing as significant those impacts which are improbable and highly unlikely, even by its own analysis. For example, Section 4.10 of the DEIS recognizes that large to very large spill events are *extremely unlikely*, but nevertheless concludes that they are *significant and unavoidable* because their potential *cannot be totally eliminated*. SEPA does not allow agencies to require absolute certainty of elimination of potentially consequential impacts. Other examples are identified throughout this comment letter. This approach of declaring improbable events as significant impacts is contrary to SEPA and any efforts to exercise substantive SEPA authority from those improbable events would be illegal.

Ultimately, any industrial activity, and many other common activities, for that matter, such as flying in an airplane or driving a vehicle can have associated accident hazards, and if an accident occurs, the consequences could be significant to the individuals affected. However, this accident potential, which exists in many activities, including most industrial activities does not equate to significant unavoidable environmental impacts and the risk can be further reduced through mitigation and operating practices. This risk context issue is discussed in more detail in comments to Chapter 4 and in particular, in Attachment 4-1 (Baker Risk 2016).

Finally, evaluation of the potential environmental impact from normal operations of the Facility should be different than evaluation of the potential environmental impact from accidents or natural disasters[11]. The EIS should correctly recognize that normal operations of the facility and, in fact, normal operation of the rail transportation and the marine vessel transportation will not result in any significant adverse impacts.

Section 3.0.4, Mitigation Measures, page 3.0-4

Section 3.0.4 of the DEIS states that additional mitigation measures have been identified by EFSEC but does not include a discussion of the decision maker's consideration of all mitigation proposed by the Applicant:

> *Additional measures identified by EFSEC to minimize remaining impacts are presented as mitigation measures for each environmental resource in Chapter 3 for consideration by decision makers...*

The failure to discuss all mitigation, specifically those proposed by the Applicant, is inconsistent with SEPA. The SEPA definition of mitigation[12] clearly intends the inclusion of applicant proposed mitigation, as well as mitigation required by regulation. Similarly, WAC 197-11-440(5)(c)(i) requires that the EIS, "Describe the objective(s), proponent(s), and principal features of reasonable alternatives. Include the proposed action, *including mitigation measures that are part of the proposal*." See also WAC 197-11-440(4) ("The summary need not mention every subject

[11] See: http://pbadupws.nrc.gov/docs/ML1310/ML13106A241.pdf
http://energy.gov/sites/prod/files/nepapub/nepa_documents/RedDont/G-DOE-AccidentAnalysis.pdf
[12] WAC 197-11-768

discussed in the EIS, but shall include a summary of the proposal, impacts, alternatives, *mitigation measures*, and significant adverse impacts that cannot be mitigated..")

Section 3.3.3 of Ecology's SEPA Handbook[13] further reinforces the broad inclusion of all proposed mitigation in SEPA review (emphasis added): "*Mitigation may be suggested by the applicant; mandated by local, state, and federal regulations*; or required through the use of SEPA Substantive Authority. (See Using SEPA in Decision Making section.) The EIS should identify possible mitigation measures that will reduce or eliminate the adverse environmental impacts of a proposal."

The Table presented in Attachment ES-2 to this comment letter provides a summary of all of the mitigation measures required by regulation, standard, code, etc., as well as those voluntarily proposed by the Applicant, which were presented in the Preliminary DEIS (PDEIS) and additional submittals to EFSEC in response to DEIS data requests. The table further identifies those instances where the Applicant's proposal exceeds applicable standards and requirements.

The FEIS should include this table. The FEIS must however also include discussion of the Applicant's proposed mitigation in the context of each impact, especially in respect to the impacts identified in Chapter 4 where all of the mitigation is specifically designed and implemented to reduce the likelihood of serious events to "improbable".

Mitigation Measures for Impacts not Attributable to the Proposed Action

This comment letter identifies many mitigation measures that address impacts that are not specifically attributable to the Proposed Action, or exceed what is required to mitigate the portion of a more general impact that is attributable to the Proposed Action. Those mitigation measures violate (SEPA and the United States Constitution.

SEPA provides that actions may be conditioned only to mitigate ***specific adverse environmental impacts*** which are identified in the environmental documents, if the conditions are stated in writing and are ***reasonable*** and capable of being accomplished.[14] SEPA regulations further provide that "[r]esponsibility for implementing mitigation measures may be imposed upon an applicant only ***to the extent attributable*** to the identified adverse impacts of its proposal."[15] Thus, mitigation should not address impacts that are beyond those attributable to the Proposed Action, such as preexisting conditions, and should only be required for the proportion of any impact that is attributable to the project. [16]

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[13] At http://www.ecy.wa.gov/programs/sea/sepa/handbk/hbintro.html, accessed December 22, 2015
[14] RCW 43.21C.060.
[15] WAC 197-11-660 (emphasis added).
[16] *See City of Olympia v Drebick*, 156 Wn.2d 289, 301 (Wash. 2006); *Citizens for Safe & Legal Trails v. King Cty*, 118 Wash. App. 1048 (2003) (EIS need not discuss mitigation to remedy existing issues because "SEPA does not require an EIS to discuss mitigation of impacts beyond those that are attributable to the project under consideration.")

Additionally, SEPA provides that mitigation measures must be both ***reasonable*** and ***capable of being accomplished*** (emphasis added).[17] Several of the proposed mitigation measures in the DEIS can only be accomplished by third parties outside of the control of the Applicant, including the rail carrier, state agencies, or in some cases, federal agencies. Therefore, they cannot be accomplished by the Applicant. Mitigation should be limited to areas under the Applicant's control and limited to actions that the Applicant can reasonably accomplish. All other mitigation measures are inappropriate.

These basic SEPA principles are consistent with and reinforce the constitutional prohibition on takings of the Fifth Amendment.[18] In general, the takings clause applies to conditions of approval imposed on development projects.[19] Accordingly, the Supreme Court has required an "essential nexus" and "rough proportionality" between the condition imposed and the justification for the condition to demonstrate that the condition is an exercise of legitimate police power, and not a taking. In essence, the government must make "some sort of individualized determination" that the condition "is related both in ***nature and extent*** to the impact of the proposed development."[20] The "nexus" component of the takings analysis prohibits a governmental agency from imposing a condition on a proposal if the condition does not further the end advanced as the justification for the condition.[21] The constitutional principle of rough proportionality prohibits agencies from imposing mitigation except to the extent that it is attributable to the impacts of the proposed action.[22]

In summary, both SEPA and the state and federal constitutions prohibit EFSEC from imposing mitigation unless EFSEC can demonstrate that the mitigation is related to and proportionate to the impacts of the proposed action.[23] As noted throughout this comment letter, the DEIS includes measures that do not comply with these basic principles. For example:

- The DEIS concludes that that the increase in vessel traffic from the Project would be minor[24] and that existing vessel traffic in the Columbia River (unrelated to the project) purportedly

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[17] RCW 43.21C.060

[18] In re MKM Northwest LLC and West Bay Construction Inc., No. 2005100144 (Thurston County Hearing Examiner, May 24, 200) (decision on Appellant's SEPA Appeal).

[19] *See Nollan v. California Coastal Comm'n*, 483 U.S. 825, 837 (1987); *Dolan v. City of Tigard*, 512 U.S. 374 (1994). The constitutional protections apply to the mitigation conditions imposed under the DEIS because Vancouver Energy's lease interest is a private land interest. The Fifth Amendment applies to lease hold interests. *Alamo Land & Cattle Co., Inc. v. Arizona*, 424 U.S. 295, 304 (1976). Additionally, port leases, in particular, are considered to be private uses when the lease is with a private party for industrial development. *See Trimble v. City of Seattle*, 64 Wn. 102, 107, 116 P. 647, 649 (1911) *aff'd*, 231 U.S. 683 (1914) (When a lease is given by the state to an individual or private corporation, the lessee thereby obtains for his or its private use certain rights and privileges in, to, and upon, such real estate. These rights and privileges constitute private property over which the lessee has, and may exercise, absolute dominion and ownership within the limitations of his or its lease).

[20] *Id*. at 391 (emphasis added).

[21] *Nollan v. California Coastal Comm'n*, 483 U.S. 825, 837 (1987);

[23] *See City of Fed. Way v. Town & Country Real Estate, LLC*, 161 Wash. App. 17 (2011) (finding that the requirement that the mitigation be related to a specific, adverse environmental impact had been met where the mitigation fee was directly proportionate to the increase in traffic caused by the proposed action.)

[24] DEIS, Section 3.14.3.3.

already creates impacts to various elements of the environment, due to, for example, wake effects. The DEIS nevertheless concludes that the Proposed Project's vessel traffic will create a "significant" impact on the basis of the broader impact already purportedly created by commercial and industrial vessel traffic presently in the river.[25]

- Similarly, the DEIS recognizes that rail traffic, generally, will grow consistent with state projections, irrespective of the Proposed Project. The DEIS further recognizes that transport of crude oil by rail is and will occur in the absence of the Proposed Project to supply an existing need of west coast refineries. The DEIS nevertheless declares that the project nevertheless will create a significant impact from incidental rail traffic, without any attempt to attribute that impact or portion of an impact to the Proposed Project.[26]
- In some cases, such as cumulative increases in rail traffic discussed in Section 5.15.2, the DEIS relies on cumulative impact figures to trigger determinations for significant impacts and recommended mitigation measures without appropriately recognizing (or scaling) mitigation measures to the relative contribution of project impacts.

In these examples and where identified elsewhere in this comment letter, EFSEC must remove or narrowly tailor the mitigation in order to be constitutional and consistent with SEPA.

Federal Law Pre-empts Regulation of Rail and Vessel Operations

Several portions of the DEIS seek to regulate or impose conditions on rail or vessel operations. The Applicant has no control over the entities that provide those services and EFSEC cannot seek to impose conditions over those entities and operations through the Site Certification process. More generally, EFSEC's mitigation measures amount to regulation of interstate commerce via rail and maritime shipping which is preempted by federal law. The doctrine of preemption, as rooted in the Supremacy Clause, article 6, clause 2 of the United States Constitution, "permits Congress to expressly displace state or local law in any given field." *Norfolk Southern Railway Company v. City of Alexandria*, 608 F.3d 150, 156 (4th Cir. 2010).

Federal law preempts EFSEC from regulating rail operations, infrastructure, safety, and hazardous material transportation.

Pursuant to its authority established in the Supremacy Clause, Congress enacted a sweeping set of laws and regulations governing transportation by rail carriers that preclude the use of SEPA to directly or indirectly regulate railroad operations, infrastructure, safety, and hazardous material transportation and preempts rail-related mitigation measures in the DEIS. Congress and the courts have long recognized the need to regulate railroad operations at the federal level, in particular, to avoid a patchwork of conflicting state and local regulations that interfere with interstate commerce. See, e.g., City of Auburn v. U.S. Gov't, 154 F.3d 1025, 1029 (9th Cir. 1998)

[25] See, e.g., Section 3.1, Earth; Section 3.3, Water Resources; Section 3.4, Terrestrial Vegetation, Section 3.6, Aquatic Species.

[26] As noted in Section2.8.2.5, NO Action Alternative, the DEIS analysis of purported rail and vessel impacts also fails because the DEIS does not properly characterize the no-action alternative and use it as a benchmark to compare it to the project in order to be able to assess which impacts (or portions of an impact) are attributable to the Facility.

(federal preemption of environmental review under SEPA of railway operations and construction projects). Through adoption of the Interstate Commerce Commission Termination Act (ICCTA), the Federal Railroad Safety Act ("FRSA"), §§ 20101 et seq., and the Hazardous Materials Transportation Act ("HMTA"), 49 U.S.C. §§ 5101, et seq., Congress granted exclusive authority to federal agencies over much of the rail-related issues addressed in the DEIS.

Many rail-related mitigation measures in the DEIS clearly attempt to regulate BNSF operations, infrastructure, and real property along rail lines. The ICCTA categorically preempts agency attempts to modify BNSF operations and property through the SEPA process and regulations promulgated by the United States Department of Transportation ("DOT") under the FRSA and the HMTA governing rail movements and hazardous materials transportation. Additionally, indirect regulation of BNSF rail operations, through conditions imposed during SEPA and Site Certification review of Vancouver Energy's proposed facility, also fails to clear the high preemption bar under the ICCTA. *See Norfolk Southern Railway Company v. City of Alexandria*, 608 F.3d 150, 160 (4th Cir. 2010).

The Ports and Waterways Safety Act Preempts EFSEC from Regulating Tank Vessels.

In addition to preemption of rail-related mitigation measures, the federal government's historic role in regulating navigation and maritime commerce constrains state and local regulation of tank vessels, including certain mitigation measures proposed in the DEIS. The federal government's long-standing role in regulating interstate navigation and commerce also preclude EFSEC from imposing certain mitigation measures that interfere with tank vessel operations associated with the Applicant's proposed Facility. Since the founding of the United States, Congress has exerted paramount authority over maritime trade and regulation. See U.S. v. Locke, 529 U.S. 89, 99 (2000) (summarizing the origins of federal regulation of interstate navigation from the Federalist Papers and legislation adopted by the First Congress). Accordingly, the United States Supreme Court recognizes federal preemption over state and local regulation of maritime commerce, both where Congress has acted and in the absence of federal action on the subject. See id. at 99-100 (citing Cooley v. Board of Wardens of Port of Philadelphia ex rel. Soc. for Relief of Distressed Pilots, 12 How. 299, 13 L.Ed. 996 (1852); Gibbons v. Ogden, 9 Wheat. 1, 6 L.Ed. 23 (1824); Sinnot v. Davenport, 22 How. 227, 16 L.Ed. 243 (1859)).

Against this backdrop, the United States Supreme Court has repeatedly found the Ports and Waterways Safety Act of 1972, as amended by the Port and Tanker Safety Act of 1978 (collectively, "PWSA"), to preempt a wide range of state and local laws directed at tank vessels.[27] See *U.S. v. Locke*, 529 U.S. 89 (2000); *Ray v. Atlantic Richfield Co.*, 435 U.S. 151 (1978). Both *Locke* and *Ray* invalidated Washington State statutes and regulations promulgated in response to major oil tanker spills based on preemption under the PWSA. More broadly, the Court established in these two cases that two classes of United States Coast Guard ("Coast Guard") regulations promulgated under the PWSA preempt state and local vessel regulations.

[27] Ports and Waterway Safety Act of 1972, Pub. L. No. 92-340, 86 Stat. 424 (July 10, 1972) and Port and Tanker Safety Act of 1978, Pub. L. No. 95-474, 92 Stat. 1471 (Oct. 17, 1978).

Thus, mitigation measures that require the Applicant to coordinate with Ecology and EFSEC on potential modification to vessel operations are preempted under Title I of the PWSA. Moreover, proposed modifications that are covered by existing Coast Guard regulations would similarly be preempted under the PWSA.

Accordingly, EFSEC should revise the analysis in the DEIS to reflect that federal law preempts all mitigation measures that require modification of Burlington Northern Santa Fe ("BNSF") rail operations leading to the project site and unreasonably interfere with BNSF operations or vessel operations.

Section 3.0.6, Study Area for Rail Transportation, page 3.0.5

In its defined study area, EFSEC uses an improper segment of rail line to evaluate environmental impacts. The segment of line used to analyze impacts within the State of Washington, defined as the "Columbia River Alignment" as depicted in Figure 3.0-2, includes approximately 50 miles of track outside of Washington State, between the Washington/Idaho border and Sandpoint, Idaho. The EIS should only consider the rail route within the borders of the State of Washington when assessing environmental impacts to the State of Washington.

Section 3.1 Earth Resources

Section 3.1.2.1, Proposed Facility, page 3.1-5, paragraph 1

The DEIS incorrectly indicates the soil profiles encountered at the Facility site include up to 25 feet of primarily granular fill, underlain in most borings by up to 17 feet of very soft to stiff silt, followed by typically loose to medium dense alluvial sand to depths ranging from 40 to 64 feet, and underlain by medium dense to very dense gravel of the Troutdale Formation.

The gravel encountered in the geotechnical borings around 60 feet is not the Troutdale Formation. The Troutdale Formation is known to be present at depths around 200 feet in this area. The FEIS needs to correctly reference the Troutdale Formation, identify the correct soil types and re-evaluate the conclusions based on correct information. All incorrect references to the Troutdale formation identified throughout the DEIS need to be corrected.

Section 3.1.2.1, Proposed Facility, page 3.1-5, bullet list, and Figure 3.1-2

Because the soils at the Facility site have been modified for over more than a century of industrial activity (as acknowledged in the last paragraph on page 3.1-3), Figure 3.1-2 and the bulleted list of soils types found on page 3.1-5 need to be qualified with a statement that these historic soil references do not accurately reflect existing soil conditions. Further, the Troutdale is not a soil type but a parent material and should be remove from the discussion of soil types described in the County Soil survey. The entire project site boundary has been filled, paved

over, or otherwise modified[28]. The soil types described in the 1973 County soil survey are not representative of existing surface soil conditions within the project footprint. The FEIS should properly acknowledge fill as the only existing soil type at the Facility site and either remove, or properly label as no longer present, the historic soil types identified in Figure 3.1-2.

Section 3.1.2.2, Rail Corridor, page 3.1-8

The DEIS makes several statements about soil types along the rail corridor that appear to be incorrect, unsupported, or missing key information. The description of soil types along the rail corridor is lacking in detail and needs to include more information rather than *numerous types* as stated in the DEIS. As written, the DEIS implies a risk of failure in a seismic event. Mapping or other information should be referenced and include a general description of how a rail bed is constructed (similar to the fill at the Facility site) to better identify the nature of the rail bed materials. Because this analysis is based on incorrect information or assumptions, the underlying conclusions are also in error. EFSEC should consult with BNSF directly about this topic, in particular, the nature of the fill constructed for the rail lines.

Section 3.1.2.3, Vessel Corridor, page 3.1-8

The FEIS should include a statement describing Columbia River bank armoring that is located along many stretches of the river. This should also state recognition that soils in these locations have been altered.

Section 3.1.2.4, Geologic Hazards, page 3.1-9, paragraph 2

In the discussion of regional earthquake hazards the DEIS overstates the magnitude of the largest potential earthquake noting that the largest potential earthquake:

> *…could be significantly greater than a magnitude 10…*

This statement is misleading to suggest that a magnitude 10 earthquake can occur at the site and along the vessel and rail corridor. A magnitude 10 or greater earthquake is very highly unlikely and beyond the magnitudes evaluated in the risk assessment. Earthquake magnitude is based in part on the length of faults and there are no known faults long enough to be capable of generating a magnitude 10 earthquake anywhere near the Facility. [29]

[28] GRI 2013

[29] Earthquakes, Megaquakes, and the Movies. (December 23, 2015), Retrieved http://earthquake.usgs.gov/learn/topics/megaquakes.php

Section 3.1.2.4, Geologic Hazards, page 3.1-11, paragraph 1 following the bulleted list

The following DEIS paragraph is missing important qualifying language that is included in the broader discussion in Appendix C:

> *In addition to onshore data, deposits of submarine landslides believed to be triggered by CSZ megathrust earthquakes are found offshore of the region (Blais-Stevens et al. 2011; Goldfinger et al. 2012, 2013). Goldfinger et al.'s (2012) data indicate that magnitude 8 to 9+ megathrust events on the CSZ occur every several hundred years on average, with events on the southern portion of the CSZ (in southern Oregon and California) occurring approximately twice as frequently as on the northern portion.*

This paragraph should include a discussion from Appendix C that presents information on the lack of consensus amongst the CSZ paleoseismology researchers on how this data should be interpreted. Specifically, include the following Appendix C passage located on page 22 paragraph 2:

> <u>The onshore data are supported and supplemented by the presence, distribution and ages of distinct sedimentary deposits (turbidites) offshore Oregon, Washington and British Columbia. These turbidites have been interpreted to be the results of submarine landslides triggered by interplate CSZ megathrust earthquakes (Blais-Stevens et al., 2011; Goldfinger et al., 2012, 2013; Hamilton et al., 2015). The Goldfinger et al. (2012) data indicate that Mw8 to 9+ megathrust events on the interplate CSZ occur every several hundred years on average, with events on the southern portion of the interplate CSZ occurring approximately twice as frequent as the northern portion. The onshore and offshore paleoseismic records differ somewhat, and there is no consensus amongst the CSZ paleoseismology researchers on how the turbidite data should be interpreted with respect to the frequency and lateral extent of paleoearthquakes offshore of the Pacific Northwest coast (Atwater and Griggs., 2012; Atwater et al., 2014).</u>

The FEIS should include a discussion that presents the uncertainty of the interpretation of turbidite frequency and lateral extent data, so that the body of the DEIS impact discussion and any conclusion regarding the significance of the impact/risk properly acknowledges the uncertainty associated with those statements. SEPA requires acknowledgement of the uncertainties in data or conclusions.[30]

Section 3.1.2.4, Geologic Hazards, page 3.1-17

The DEIS makes several statements about landslide risk along the rail corridor that appear to be incorrect, unsupported, or missing key information. Because this analysis is based on incorrect information or assumptions, the underlying conclusions are also in error. EFSEC should consult with BNSF directly regarding landslide hazards along the rail corridor.

[30] See WAC 197-11-080

Section 3.1.2.4, Geologic Hazards, page 3.1-18

The DEIS indicates that subsea landslide-generated tsunamis could extend some distance up the Columbia River from the mouth. The discussion of affected environment should provide more detail on the nature and extent of tsunamis in the Columbia River. As noted in the discussion of impacts (Section 3.1.3.4, page 3.1-28) wave heights from a tsunami rapidly dissipate in the estuary. The DEIS statement regarding potential for subsea tsunamis impacts is overstated.

Section 3.1.3.3, Vessel Corridor, page 3.1-24

The DEIS indicates that vessel wakes could impact the lower approximately 33 miles of the Columbia River:

> *..Increased deep-draft vessel traffic has the potential to increase soil erosion caused by vessel wakes. The banks of the Columbia River generally consist of loose, unconsolidated soils and sedimentary deposits, and soil erosion* ***would be limited to the lower approximately 33 miles of the river where shorelines with beaches clo****se to the channel are not shielded from wave action and have beach slopes less than 10 percent. Wake effects would be the greatest as vessels pass through the Columbia River estuary and its associated habitats including tidal wetlands, shallow water, and tidal flats…*

The bold portion of the statement is an incorrect characterization of the reference document (Pearson et.al. 2006), and the DEIS analysis does not support identifying the entire lower 33 miles of the river as being susceptible to erosion by vessel wakes either in the baseline condition or with the Proposed Action. The reference to vessel wakes affecting the lower 33 miles appears to arise from a misunderstanding about the results of a study that focused on juvenile salmonid stranding by vessel wakes on beaches in the lower Columbia River. Stranding of juvenile fish by vessel wakes is addressed in detail in the comment on Section 3.6.3.3 (discussed later in this letter) of the DEIS and the following bullets paraphrase that detailed discussion.

- Pearson et al. 2008 was a GIS-based analysis of the physical characteristics of the Columbia River shoreline intended to determine the portions of the river that presented a risk of stranding of fish when a vessel wake interacted with the shoreline. A key conclusion of Pearson et al. 2008 was: "The results of this study clearly indicate that physically-based susceptibility to stranding of juvenile salmonids by ship wakes is limited to a portion of the LCR [lower Columbia River] - approximately 16% (~33 miles) of the LCR shorelines with beaches close to the channel, not shielded from wave action, and with beach slopes less [than] 10%."

- The 33-miles of shoreline referenced by Pearson et al. (2008) is the sum of the length of numerous non-contiguous beaches that the authors concluded exhibited physical characteristics predicted to have an above-minimal risk of stranding. There is no contiguous 33-mile reach of the "lower river" where the shoreline characteristics indicate a susceptibility to stranding.

- Pearson et al. (2008) defined the "Lower Columbia River" on page 29 of their report to begin at the mouth [RM 0] and extend to Vancouver, Washington [RM 104], which corresponded to the upstream and downstream extents of their study area and encompasses essentially the entire "Vessel Corridor" for the DEIS. Pearson et al. (2008) found that shorelines downstream of RM 22 were too far distant from the navigation channel for vessel wakes to pose a stranding risk for juvenile salmon. Further, only two areas were identified with an above-minimal risk of stranding between RM 22 and RM 33 and these were not identified as areas of high stranding risk. Therefore, the lower 33 miles of Columbia River, contrary to statements in the DEIS, is an area of very low potential for vessel wakes to interact with the shoreline in a manner to strand fish, erode substrate, or dislodge wetland or riparian vegetation.

The DEIS is incorrect in focusing on stranding impacts and thus bank erosion in "the lower 33-mile portion of the Columbia River". Further, it is incorrect to extrapolate from the erroneous stranding conclusions for the lower 33 miles of the river to evaluate the potential for impacts to other shoreline resources because the conclusion of Pearson et al. (2008) is that wave energy from vessel wakes seldom reaches the shoreline in the lower 33 miles of the river. Therefore, there is no rationale to conclude vessel wakes strand fish or that vessel wakes cause other effects in the "lower 33-mile portion of the Columbia River".

Further, the DEIS indicates that effects would be greatest within the *Columbia River estuary*, apparently a subset of the *lower approximately 33 miles*. This is a confusing statement, as the DEIS defines the estuary as the reach of the river below RM 34 (Section 3.3.2.3, page 3.3-33). Thus, the *lower approximately 33-mile* reach and the *estuary* are defined as essentially the same section of river. Further, as discussed above, there is no basis for concluding that the estuary is susceptible to erosion from vessel wakes.

The DEIS assumes that the shoreline is susceptible to erosion from vessel wakes but it does not provide any information to demonstrate there is a risk of it occurring. The information presented above in the cited comments demonstrates that the lower 33 miles of the river has very limited exposure to vessel wakes. The Corps' Channel Deepening EIS (USACE 1999) reported that the natural shorelines of the lower Columbia River (encompassing the vessel corridor for the DEIS) have remained very stable over the past 100 years, consisting largely of erosion-resistant sand, silt, and clay deposits (USACE 1999). Approximately half of the shoreline consists of between RM 21 and 106 are dredge disposal sites which are not natural shorelines and are highly susceptible to erosion (USACE 1999). Many of the dredge disposal sites are sandy habitats that are frequently disturbed by sand placement (USACE 2016). The disposal sites are subject to wakes, currents, and continual wind waves (USACE 1999).

Additionally, the entire vessel corridor is currently exposed to vessel wakes from the ships that use the river. The vessels that would call at the Facility terminal are within the size range of current vessels and would be piloted at similar speeds. Therefore, the wakes from these vessels would be similar to current wakes. This means the shorelines, which have little susceptibility to erosion, would be subject to an incremental increase in vessel wakes that are not currently

causing erosion. It is correct to conclude that there will be more vessel wakes, but there is no basis for concluding there will be erosion impacts in the estuary (lower 33 -34 miles of the river) from these wakes that would affect complex habitats. Further, impacts upstream to RM 106 are not expected based on description of the river banks presented in the Corps' Channel Deepening EIS (Corps 1999).

Finally, the DEIS impact analysis does not adequately consider the No Action Alternative or complete the analysis necessary to directly attribute any purported impact to this Proposed Action, as distinguished from baseline conditions and non-project impacts. As discussed in the in the Applicant's comments on the No Action Alternative (Section 2.8.5.2) and as to vessel traffic more specifically discussed in Section 3.4.3.3, the vessel traffic (including historical variation) on the Columbia River is well established and has occurred over long periods of time. Based on historic vessel traffic analysis, the FEIS should acknowledge that any proposed increased in vessel traffic attributable to the Facility is minor. Because any vessel wake impacts occur equally with existing and other non-project traffic as they would with the Proposed Action vessel traffic, it is not possible to distinguish Proposed Project vessel impacts from the No Action Alternative vessel traffic impacts.

Section 3.1.3.4, Potential Impacts Resulting from Geologic Hazards, pages 3.1-24 (last sentence) and 25 (bulleted list)

In the discussion of impacts to the proposed Facility from ground motion/shaking, the DEIS indicates that the Applicant designed the facility to address three different magnitude earthquake events. While elements of the facility are being designed in consideration of the three levels it is not an accurate representation of the entire facility. EFSEC should update the following information as presented to correct the error:

> *Ground Motion/Shaking*
> *Prolonged earthquake ground shaking has the potential to damage buildings, pipelines, or storage tanks. Seismic design standards and building codes would be applied in the construction of Facility elements to reduce the likelihood of negative impacts from ground motion. Engineers use seismic design parameters to develop specific levels of structure performance during an earthquake. The performance levels range from prevention of collapse to protect human lives to designing structures that continue to function at a high level immediately following the earthquake. ~~The Applicant has proposed to design Facility structures considering ground motion from earthquakes of three different magnitudes:~~*
>
> ~~• **Operational Level Earthquake** – 5.8 magnitude. The Applicant would design structures such that during a magnitude 5.8 earthquake, damaged structures may require only minor repairs for them to continue functioning.~~
> ~~• **Contingency Level Earthquake** – 8.4 magnitude. In the event of a magnitude 8.4 earthquake, structures would be designed such that damage could render them temporarily nonfunctional, but substantial repairs could return the damaged structures to full functionality.~~
> ~~• **Design Earthquake** – 9.0 magnitude. In the event of a magnitude 9.0 earthquake, structures~~

~~would be designed to prevent collapse to reduce the possibility of injury, loss of life, and environmental damage (e.g., oil spills). In such a massive earthquake event, however, damage to some structures could be beyond reasonable levels of repair and some Facility elements may require replacement.~~

The potential for seismic ground motion to damage a given bulk storage tank depends on a number of factors, including the type and strength of seismic motions, ground/soil conditions, tank structure, and the amount and type of material in the tank at the time of the earthquake. A study commissioned by the US National Institute of Standards and Technology concluded that, in general, bulk storage tanks perform reasonably well in earthquakes, particularly tanks with diameter to height ratios of greater than two (Cooper 1997). The bulk storage tanks at the proposed Facility would have a diameter to height ratio of five. In accordance with the application of the currently adopted IBC, construction of new tanks is required to consider site-specific seismic loading. The Applicant has stated that the oil tanks in the storage area (Area 300) would be designed to the seismic provisions in Annex E of the twelfth edition of the API 650 standard, which is aligned with the ASCE 7-10 standard (BergerABAM 2014).

The upland aboveground facilities, other than the oil storage tanks, would meet the provisions of IBC 2012, which incorporates the ASCE 7-10 standard by reference.

Marine terminal dock modifications in Area 400 would conform to the IBC 2012, as amended and adopted by the State of Washington and the City of Vancouver, with the exception of mooring and berthing design, structural load combinations, and seismic design. The seismic design of piers and wharves not accessible to the general public is beyond the scope of the ASCE 7-10 standard. The recently released ASCE 61-14 standard, Seismic Design of Piers and Wharves, would be used for developing *the seismic design* ground motions for three levels (Operating Level Earthquake, Contingency Level Earthquake, and Design Earthquake) for the Berth 13 trestle and platform *~~of such~~ structures in the marine terminal (Area 400). If these design standards are implemented, the risk of severe structural damage or failure of Facility elements from facility shaking resulting from earthquake ground motion associated with a great earthquake on the CSZ or other lesser earthquakes from the CSZ or other faults would be minor. It is important to note, however, that the risk is never completely eliminated irrespective of design and construction used at a site.*

Sections 3.1.3.4, Potential Impacts Resulting from Geologic Hazards and 3.1.6, Mitigation Measures, pages 3.1-25, 3.1-30, and 3.1-26

The DEIS states that there is a potential for impacts resulting from the lack of ground improvements under the containment berm as follows and includes a specific mitigation measure requiring stone columns under the berm:

At the storage area (Area 300), no ground improvement is proposed for soils underlying the secondary containment berm. The stone columns under the foundations supporting the storage tanks do not extend to the berm. Therefore, potential exists for liquefaction and ground deformation under the secondary containment berm. Designing the berm to withstand ground

motion/shaking is appropriate but needs to be combined with an assessment of required mitigation for potential liquefaction (i.e., ground improvements) beneath the berm.

It appears the DEIS may be commenting on the possible need for ground improvement under the berms for two reasons: (1). Berm Seismic Settlement resulting in the berm being too low; and (2). Berm Seismic Stability where there is a risk the berm will experience a slope stability failure due to shaking or loss of bearing capacity due to liquefaction. The risk of seismic bearing capacity and slope stability of the berm has been preliminarily evaluated. Based on the following items, the risk is low and ground improvement is not required.

The GRI Report (Dec. 20, 2013) conservatively estimates that Area 300 could see between 6″ to 10″ of liquefaction-induced settlement. The secondary containment design is based on 110% of the largest tank volume and the 100 yr. 24-hr. storm (4.3″). This design results in a freeboard of 8″. In a worst case scenario of maximum liquefaction-induced settlement, at the same time of design rainstorm, not only would the berm settle up to 10″ but so would the other non-ground improved surface area inside of the berm. The settlement of the non-ground improved area inside the containment berm would be sufficient to contain the difference between, the 10″ liquefaction-induced settlement and the provided 8″ of freeboard.

GRI has addressed seismic stability of the berm in terms of bearing capacity failure or breaching as follows: Berm Seismic Stability. Based on an assumed groundwater elevation +12 feet, and the thickness of well compacted structural fill at the storage site, the site will be mantled with 15 to 20 feet of non-liquefiable soils which are not susceptible to reduction of seismic strength. Preliminary evaluation of the seismic stability of the berm indicates that the risk of seismic bearing capacity failure impacting the berm is low. It is the opinion of GRI that the risk of the code earthquake damaging the berm and causing breaches is low. Thus the mitigation measure specifying that ground improvements be extended under the berm is unwarranted.

Sections 3.1.3.4, Potential Impacts Resulting from Geologic Hazards, page 3.1-26

The DEIS identifies a potential seismic impact on the basis that stone columns do not extend to the bottom of the potentially liquefiable layer and requires a mitigation measure to reassess the depth stone columns in Area 400 and 500. The stated impacted and associated mitigation measure are not supported by the analysis as they incorrectly assume or conclude that acceptable ground performance can only be achieved if the stone columns extend to the bottom of the potentially liquefiable layer. DEIS Chapter 3, page 3.1-14.

Within Area 400 the pipeline, pipeline supports and the ground improvement were designed to function as a system. When subjected to design earthquake loading the system will result in actual movements less than the movement which would be expected to cause pipeline rupture or other damage. Following a design seismic event, the Applicant will undertake system inspection and repair.

The system was designed in accordance with all applicable building codes using widely accepted design methods. The conclusion of the analysis is that in the improved condition isolated and discontinuous zones of liquefaction may occur and should these discontinuous zones of liquefaction develop very little movement at the pipe supports is expected. The analysis indicates that, at the pipe supports, vertical movement less than 2 inches plus an additional 2 inches of horizontal movement is expected. The transfer pipes have been designed to accommodate this movement. The calculated movement includes the effects of lateral spreading associated with the portion of the riverbank between the pipe rack foundation and the top of the riverbank's slope.

Within Area 500 where the transfer pipelines are located, ground improvements would be constructed at anchor points to ensure sufficient support for the pipelines. The design utilizes a foundation of spread footings, with a depth of 5 feet for non-anchor footing, and 10 feet for anchor footings. The spread footings will be constructed by excavating the footing footprint, layering base materials, concrete forming and pouring, and backfilling. They are a common construction technique for providing stability in weak soils, and the design and size of the footings accounts for both the bearing capacity and resistance, but also settlement which may occur.

Sections 3.1.3.4, Potential Impacts Resulting from Geologic Hazards, pages 3.1-26

The DEIS places unwarranted reliance or confidence on FLAC, PLAXIS numeric modelling analysis to ensure adequate design of the ground improvements.

FLAC and/or PLAXIS do produce extensive predictions in two and three dimensions that can be used to generate realistic looking graphics. However, numerical model software such as FLAC and/or PLAXIS are not sufficiently developed to reliably model the performance of highly three dimensional ground improvement systems such as those proposed for this project. The Applicant has explored the use of 2D and 3D numerical modeling using programs such as FLAC and/or PLAXIS. The nationally recognized numerical modelers with whom we have consulted indicate that the computed results from FLAC and/or PLAXIS can be variable over a wind range when analyzing the performance of a highly three dimensional ground improvement system. In addition, this type of analysis is highly subjective to the assumptions made during development and the model and selection of more than two dozen individual input parameters per soil layer per analysis, all of which vary as a function of time within assumed earthquake records.

For these reasons, a technical decision to limit the analysis methods by using the pseudo-static limit equilibrium method is preferable, and development of seismic 2D model followed by a pseudo-static 3D model to assess the design provides a more useful analysis approach. The seismic 2D and pseudo-static 3D model approach is widely accepted in the industry and less susceptible to subjectivity. Indeed, the Washington Department of Transportation requires use

of pseudo-static stability analysis for evaluation of seismic stability of slopes and embankments.[31]

Therefore, the following language should be added to the DEIS:

> The Applicant fully considered various methods of analysis to ensure adequate design of ground improvements, exploring the use of both numerical modeling using programs such as FLAC and/or PLAXIS, and the more widely-used pseudo-static limit equilibrium method. FLAC and/or PLAXIS produce computed results that are too variable to provide reliable, are not calibrated to observed performance with regard to lateral movements caused by liquefaction, and are more susceptible to produce results that fail to reflect realistic conditions because their results are highly dependent upon complex, subjective input assumptions. In contract, the pseudo-static limit equilibrium method is widely accepted, and provides an analysis that is less susceptible to the subjectivity and complexities of model inputs, and more predictive of the adequacy of ground improvements.

Sections 3.1.3.4, Potential Impacts Resulting from Geologic Hazards and 3.1.5, Mitigation Measures, pages 3.1-26 and 3.1-

The DEIS analysis of potential impacts from liquefaction at the Facility includes a statement that indicates there is no well-established seismic performance record of the DSM panels supported on jet grout columns which are proposed as ground improvements in Area 400.

The review comment is correct in stating that there is no well-established seismic performance record for the combination of ground improvements proposed for Area 400 (i.e. stone columns, deep soil mixing, jet grouting, etc.), but the DEIS fails to state that the various elements of the proposed ground improvement system have a very well-established seismic performance record and are frequently used as part of liquefaction mitigation strategies by federal, state and local governments. (e.g. "Soil Improvement at the Trident Submarine Facility, Soil Improvement, ASCE, April 28, 1987, pg. 215) As the design hazards have increased, the combination of various ground improvement methods has become common, if not routine. The specific arrangement of the multiple ground improvement methods has been customized for this project, the anticipated hazards, and the amount of allowable movement. Like other

[31] See WSDOT Geotechnical Design Manual, Dec. 2013, P. 6-45, available at http://www.wsdot.wa.gov/publications/manuals/fulltext/M46-03/Chapter6.pdf

complex projects, the proposed design has been customized to the specific site so it is not surprising that there is "no well-established seismic performance record" of this unique design.

We request the statement in the DEIS is deleted and additional clarifying language is included on page 3.1-26 immediately following the bullet points, as follows:

> The various elements of the proposed ground improvement system (i.e. stone columns, deep soil mixing, jet grouting, etc.) have a well-established seismic performance record. As the design hazards have increased, the combination of various ground improvement methods is becoming common, if not routine. The specific arrangement of these proven, multiple ground improvement methods has been customized for this project, the anticipated hazards, and the amount of allowable movement. Like other complex projects, the proposed design has been customized to the specific site. Therefore, while the project-specific design, combining ground improvement methods, does not have a well-established seismic performance record, the design elements themselves are well-proven, and customized the Applicant's analysis supports a conclusion that the design is sufficient to meet all applicable standards.

Section 3.1.3.4, Potential Impacts Resulting from Geologic Hazards, pages 3.1-26

The DEIS notes that there could be lateral spreading of the riverbank between the area of ground improvement and the river, and that movement of the soil could impact the dock structure and thereby impact a vessel. The DEIS fails to acknowledge that the Applicant has designed the dock to consider the potential impact of slope failure. The DEIS states, at page 3.1-26:

> *Potential sliding of portions of the shoreline embankment south of and downslope from the system of proposed ground improvements is not mitigated by these improvements and, if this sliding occurs, it could deform the dock or displace a moored vessel.*

The dock structure has been analyzed for the potential impacts from failure of the slope on the piles. The improvements proposed by the Applicant have been designed to address these potential loads. The FEIS should reflect these facts and modify the assessment to note the Applicant provided mitigation. The mitigation measure requiring ground improvements in the sloping embankment below the dock should be eliminated as noted in comments on Section 3.1.5 below.

Section 3.1.3.4, Potential Impacts Resulting from Geologic Hazards and Section 3.1.6, Significant Unavoidable Adverse Impacts, pages 3.1-28 and 3.1-31

The DEIS concludes that a tsunami could have major impacts on the Vessel Corridor and identifies impacts to vessels as significant unavoidable adverse impact. The conclusion is not

supported by analysis in the DEIS on the impact from a tsunami on vessels in the nearshore environment or in river mouth.

The DEIS nominally describes tsunami warning and operational protocols that will instruct vessels to avoid those areas during tsunami warning after earthquake event. This is important mitigation, because, as indicated in the DEIS, the tsunami impact is most acute in specific locations that vessels can avoid with adequate warning. However, the DEIS does not explain typical timing of that system and whether the system can provide sufficient warning to mitigate the risk.

Even without this mitigation, the impact analysis acknowledges the tsunami risk is a highly improbable event but nevertheless concludes the ensuing tsunami is *significant.*

Specifically, the DEIS analyzed a tsunami created by the maximum considered earthquake (MCE) of 8.9 magnitude resulting from a 2,475-year return period earthquake on the CSZ. As noted above in comments on Section 3.0.3 above, the probability of a risk is a crucial factor in evaluating whether the risk is significant. In this instance, 2,475 return period cannot be considered probable or significant adverse impact.

Finally, this analysis and conclusion does not adequately consider the no-action alterative or complete the analysis necessary to directly attribute any purported impact to this project, as distinguished from baseline conditions and non-project impacts. As indicated in Section 2.7 and in Section 2.7 and 3.14.2.3, the vessel traffic on the Columbia River is well-established and has occurred over long periods of time. According to the analysis in the DEIS, any purported increase in vessel traffic attributable to the Project is minor. Existing vessel traffic currently is subject to the risk of a tsunami and other increases in non-project traffic will also be similarly vulnerable. The analysis and recommendation do not acknowledge that any purported impacts occur with existing vessel traffic and will continue to occur from non-project related increases in vessel traffic. Accordingly the vessel traffic associated with this project does not create an impact distinguishable from the no-action alternative such that any purported impacts are not attributable to this project.

Section 3.1.3.4, Potential Impacts Resulting from Geologic Hazards and Section 3.1.6, Significant Unavoidable Adverse Impacts, pages 3.1-27 through 3.1-28 and 3.1-31

The analysis in Section 3.1.3.4 does not support the conclusion in Section 3.1.6 that a *large earthquake* could cause moderate to major disruptions to rail transportation in areas along the rail corridor.

First, the analysis is inconsistent with the conclusion. The analysis indicates that the seismic hazard impacts along the rail corridor *could vary from negligible to moderate*, and that damage to rail facilities are likely to be *minor*. There is no explanation why these impacts can *cause moderate to major disruptions* that constitute a *significant, unavoidable adverse impact*. The

conclusion regarding disruption should be revised to match the conclusion regarding impact (minor).

Second, the DEIS ignores the mitigation of BNSF practices when weighing the significance of the risk. The DEIS makes several statements about impacts of an earthquake along the rail line that appear to be incorrect, unsupported, or missing key information. While the DEIS nominally discusses BNSF policy in the event of an earthquake, it does not discuss how that reduces the risk. Because this analysis is based on incorrect information or assumptions, the underlying conclusions are also in error. EFSEC should consult with BNSF directly about this topic.

Third, this impact analysis does not adequately consider the No Action Alternative or complete the analysis necessary to directly attribute any purported impact to this project, as distinguished from baseline conditions and non-project impacts. As indicated in Section 2.6 of the DEIS, the rail corridors are well-established and have been in use for long periods of time. The analysis does not acknowledge that existing rail traffic will continue and non-project related increases in rail traffic will occur consistent with state projections. The rail traffic associated with the Proposed Action does not represent an increase in traffic from the no-action alternative and any purported impacts are not attributable to this Proposed Action.

Additionally, in the absence of this Proposed Action, other entities will continue to use and likely increase the use of the railway corridor to transport crude oil to meet the current demand of West Coast refineries for mid-continent North American crude oil. Indeed, Section 2.8.2.5 specifically acknowledges that West Coast demand ….*would require continued transport of crude oil by existing transportation modes (including pipelines, tanker trucks, and rail) from sources to refineries, or from sources to new or expanded crude-by-rail terminals in other West Coast locations*… Thus the risk presented by an earthquake event exists under present conditions and in the no-action alternative. The DEIS has not and cannot attribute this risk and impact to the Proposed Action.

Finally, the conclusion that the earthquake risk constitutes a "significant" adverse impact ignores the extremely low probability of the earthquake event at issue. As noted above in comments on Section 3.0.3, the probability of a risk is a crucial factor in evaluating whether the risk is "significant." In this instance, the return period of the events that are explored in the DEIS are improbable and remote. As noted in the supporting Appendix C, the risk of these events "diminishes along the BNSF rail corridor heading from the SVEDT [sic] site toward the Washington-Idaho border." App. C at 4-5. This risk cannot be considered a probable or significant adverse impact because it is remote and unlikely.

Section 3.1.4, No Action Alternative, page 3.1-29

The discussion of the No Action Alternative fails to recognize that the rail corridor impacts identified in Section 3.1.3.4 would be exactly the same with or without the Project. Similarly,

the No Action Alternative risk to marine vessel transport is the same for other maritime commerce on the river. The No Action Alternative discussion should be revised accordingly.

Sections 3.1.5, Mitigation Measures, page 3.1-30

As drafted, the DEIS currently requires as mitigation that the Applicant reassess and reconfirm the design of the seismic ground improvements for various elements of the Facility. The Applicant believes that the proposed design at each location adequately addresses the seismic stability risks identified, such that there would be no significant impacts (see discussion regarding SEPA significance at section 3.0.3above). Further, as discussed in more detail below, the Applicant's consultants have not recommended the 3-D modeling (e.g., FLAC, PLAXIS) of the ground improvement system in the marine terminal, due to uncertainties regarding assumptions and therefore reliability of the results. However, the Applicant is willing to meet with EFSEC and its seismic consultants to re-evaluate each of the suggestions identified in this section of the DEIS, to see if additional design modifications are warranted, and asks that those discussions occur in the near future to facilitate preparation of results and responses in the FEIS.

Some more specific responses to DEIS statements or recommendations for each separate Area are briefly described below:

Area 300 Berm:

As discussed in comment to DEIS Section 3.1.3.4 above, extending the ground improvements beneath the berm is not warranted based on the berm design. This mitigation measure is not warranted and should not be included in the FEIS.

Area 400 Marine Terminal and Western Portion of Area 500 Transfer Pipeline:

The dock and trestle and the pipeline are being designed to accommodate seismic soil loads and limit deformations to acceptable levels. The dock structure is being designed to accommodate the lateral spreading seismic soil loads from the unimproved portion of the riverbank moving toward the dock and trestle. Estimates of the extent of lateral spreading deformations and kinematic loads resulting from spreading soil impacting the dock are summarized in the geotechnical report for the dock facility[32].

Deformation criteria for the pipeline supports near the abutment are indicated in the ground improvement basis of design. Additionally, universal tied expansion joints will be installed at the transition from the ground support to the support on the dock to mitigate differential movement between components.

[32] GRI. September 5, 2014. TesoroSavage Vancouver Energy Distribution Terminal-Dock Facility, Port of Vancouver, USA.

The DEIS identifies a potential seismic impact on the basis that stone columns do not extend to the bottom of the potentially liquefiable layer and requires a mitigation measure to reassess the depth stone columns in Area 400 and 500 (DEIS Chapter 3, page 3.1-14). The stated impact and associated mitigation measure are not supported by the analysis as they incorrectly assume or conclude that acceptable ground performance can only be achieved if the stone columns extend to the bottom of the potentially liquefiable layer (see comments on Section 3.1.3.5 above). The FEIS should eliminate the associated mitigation measures.

Within Area 400 the pipeline, pipeline supports and the ground improvement were designed to function as a system. When subjected to design earthquake loading the system will result in actual movements less than the movement which would be expected to cause pipeline rupture or other damage. Following a design seismic event, the Applicant will undertake system inspection and repair.

The system was designed in accordance with all applicable building codes using widely accepted design methods. The conclusion of the analysis is that in the improved condition isolated and discontinuous zones of liquefaction may occur and should these discontinuous zones of liquefaction develop very little movement at the pipe supports is expected. The analysis indicates that, at the pipe supports, vertical movement less than 2 inches plus an additional 2 inches of horizontal movement is expected. The transfer pipes have been designed to accommodate this movement. The calculated movement includes the effects of lateral spreading associated with the portion of the riverbank between the pipe rack foundation and the top of the riverbank's slope.

Within Area 500 where the transfer pipelines are located, ground improvements would be constructed at anchor points to ensure sufficient support for the pipelines. The design utilizes a foundation of spread footings, with a depth of 5 feet for non-anchor footing, and 10 feet for anchor footings. The spread footings will be constructed by excavating the footing footprint, layering base materials, concrete forming and pouring, and backfilling. They are a common construction technique for providing stability in weak soils, and the design and size of the footings accounts for both the bearing capacity and resistance, but also settlement which may occur.

3D Numeric Modeling (e.g. FLAC, PLAXIS):

Section 3.1.5 also includes a mitigation measure to use a numerical modeling program (FLAC/PLAXIS) to analyze the performance of the deep soil mix panels ground improvement. However, as noted in separate comment our comments to Sections 3.1.3.4 Potential Impacts Resulting from Geologic Hazards, FLAC/PLAXIS provide a less reliable model of the performance of those ground improvement systems than the pseudo-static limit equilibrium method proposed by the Applicant. Therefore, the mitigation suggested is unwarranted and should be omitted.

Appendix C also recommends use of numerical models (in addition to pseudo-static methods) to analyze the Marine Terminal. The Appendix notes that the analysis should be based on the improved soil state at the Marine Terminal. While the use of FLAC/PLAXIS is unwarranted, as noted above, the analysis should be based on the improved soil state, as recommended in the Appendix. This recommendation does not, however, appear in the DEIS; therefore, The Applicant asks that the DEIS incorporate the recommendation from AECOM.

At the Berth 13 structure, based on the current design of the ground improvements, the need for additional numerical modeling is not warranted. The DEIS also proposes mitigation for the Berth 13 trestle and platform structures, calling for additional numerical modeling. As noted previously, the additional modeling is unreliable and therefore an ineffective means of testing design performance. Moreover, as noted in our comments to Section 3.1.3.4, Potential Impacts Resulting From Geologic Hazards Pages 3.1-24 (last sentence) and -25 (bulleted list) (Earth - Ground Shaking, Discussion on Code), the Berth 13 trestle and platform structures will implement the recently released ASCE 61-14 Standard, Seismic Design of Piers and Wharves. As a result the risk of structural damage or failure of that Facility element is minor. Therefore, the Applicant asks that the mitigation measure be removed.

Groundwater Monitoring Downslope from Jet Grout Installation:

As discussed in more detail in Comment on Section 3.3.5 below, based on site constraints and the location of the proposed ground improvements for the marine terminal and the western portion of the transfer pipeline, there is not sufficient room to install groundwater monitoring downslope of the jet grout installation, without those monitoring wells simply collecting the grout itself. As such, this mitigation measure is not feasible and the Applicant suggests up-river and downriver water quality monitoring as an alternative.

Section 3.1.6, Significant Unavoidable Adverse Impacts, page 3.1-31

The conclusion regarding significant unavoidable adverse impacts is overstated in light of the SEPA definition of significant, the unlikelihood of the major earthquake event identified as causing the significant impact and the level of ground improvement/seismic design elements that have been incorporated into the project and added by the additional recommended seismic mitigation in the DEIS. See prior comments on section 3.0.3 of DEIS above.

Further, there is no basis on which to conclude that the impacts would be *moderate to major unavoidable impacts* given the DEIS discussion in this section—where the impacts are identified as *negligible, or minor* and the design is deemed *acceptable*. Additionally, the *moderate to major* disruption to rail traffic discussed in this conclusion is not caused by the project, is inherent in the presence of the rail line in the State of Washington, and should not be included in a discussion of impact of the Proposed Action.

Finally, as discussed in Section 3.1.3.4, above, the vessel/tsunami impact should not be labeled as significant and unavoidable, given the unlikelihood of the event and the tsunami warning

system and operational protocols that are implemented if one does occur. Each of these conclusions are another example of the overstatement of the impact in light of the SEPA definition of what should be labelled significant. See discussion regarding SEPA standard of significant impacts in the comments on Section 3.0.3 of the DEIS above.

Section 3.2, Air Quality

Section 3.2.3.1, Proposed Facility and Section 3.2.4.1, Impact Assessment, page 3.2-6 last paragraph and page 3.2-11, paragraphs 3 and 4

These DEIS sections discuss air quality General Conformity in conjunction with application of the 100 tons per year (tpy) *de minimis* threshold applicable to General Conformity Review. The DEIS, however fails to indicate that General Conformity review applies only to those emission sources and activities subject to Federal approval.

Federal air quality conformity rules[33] require that actions within air quality nonattainment or maintenance areas, which are either taken or approved by federal agencies, not cause new violations of the NAAQSs or prolong the time required to attain these standards. Emissions subject to consideration in this review are those directly and indirectly related to an action approved by a federal agency for which the agency has both jurisdiction and the ability to control emissions from the subject sources. Operational emission sources subject to other federal emissions requirements (e.g., truck engines) are not considered as part of the General Conformity review because these sources are not subject to the control of individual reviewing agencies. Construction elated emissions from associated project-connect actions are also not subject to General Conformity review.

To address this comment, we request that the FEIS provide more complete discussion of the General Conformity requirements. Clearly state that the calculated construction-related emissions in the DEIS include sources that are not actually subject to the General Conformity emissions estimate – and that project emissions are still less than the General Conformity *de minimis* levels. Actions with emissions clearly at or below *de minimis* levels are exempt from General Conformity review.

Section 3.2.4.1, Impact Assessment, pages 3.2-11 to 16 and Table 3.2-14

The DEIS contains the following discussion, which is not accurate in regards to PSD and GCR rules:

> *The estimated emissions for CO were compared to the General Conformity Rule (GCR) de minimis threshold to evaluate conformity. The emissions from all proposed construction activities*

[33] 40 CFR Part 93 Subpart B §93.152. Specifically, §93.152(b) requires a conformity determination for each criteria pollutant or precursor where the total of direct and indirect emissions of the criteria pollutant or precursor in a nonattainment or maintenance area caused by a Federal action would equal or exceed any of the NAAQs.

were compared to the de minimis threshold of 100 tons per year to conservatively evaluate impacts. The remaining criteria pollutants were evaluated against the general Prevention of Significant Deterioration (PSD) 250-ton-per-year threshold to compare the level of emissions to that of a major stationary source.

Section 3.2.4.1 of the DEIS begins with a discussion of emissions resulting from construction activities, but the last sentence in the second paragraph implies that emissions unrelated to construction will be compared with the 250-ton PSD permitting threshold that applies to some sources. Later, on page 3.2-14, Table 3.2-5 compares potential emissions from facility operation with the 100-ton PSD permitting threshold that applies to petroleum storage and transfer terminals with a total storage capacity exceeding 300,000 barrels. Because emissions of the relevant pollutants do not exceed the major source thresholds, the facility is subject to the minor source permit programs.

On page 3.2-15, the DEIS compares mobile source emissions to the PSD threshold of 250 tpy. In an air permit determination mobile source emissions are not considered in application of the PSD threshold. Despite this regulatory misstep, the DEIS concludes that no criteria pollutant mobile emissions would exceed the clearly irrelevant PSD and HAP permitting thresholds. Although this analysis is improper, the DEIS compounds the error by asserting air quality impacts from mobile sources would be minor to moderate. The analysis then aggregates and compares stationary and mobile source emissions to the 250-ton PSD This PSD threshold does not apply to either of these source categories.

To be clear, stationary source emissions are demonstrably less than PSD and HAP major source thresholds, but the DEIS concludes that air quality impacts would be expected to be minor to moderate from combined emissions from stationary and mobile source operations. If the project stationary source emissions are below PSD and HAP thresholds for air permitting purposes, air impacts from such emissions would be expected to be negligible. For further verification certain emission impacts are further addressed using dispersion modeling as discussed below.

This DEIS misapplication of equating annual emissions with potential impacts reflects a fundamental misunderstanding of health risk-based air quality analysis for criteria pollutants. While annual mass emissions (i.e., tpy) may be used for purposes of screening out actions from needing further regulatory analysis, regulations do not allow inferences regarding air impacts based on annual emissions that do not exceed applicable regulatory thresholds. Rather, impacts are assessed based on projected ambient concentrations of criteria air pollutants (i.e., ppm or $\mu g/m^3$) and the duration of human exposure (i.e., ppm or $\mu g/m^3$ exposure level over a period of

years) to such pollutants. Impacts are then assessed by comparing estimated concentrations with established health-protective ambient air quality standards.[34]

Sine Acceptable Source Impact Levels (ASILs) such as the screening level for DPM considered in the DEIS analysis, are based on estimates of the possible risk of the additional incidence of cancer in a population with continuous (i.e., 24 hours per day) exposure to the pollutant over 70 years. So instead of standards based on relatively well-defined dose-responses, ASILs are based on the estimated potential risk associated with long-term, continuous exposure to the particular pollutant. The Applicant recommends the FEIS properly characterize potential impacts from toxic air pollutant emissions based on such acceptable screening levels and not mass-based emissions. Moreover, dispersion modeling is the preferable regulatory and technical Moreover, dispersion modeling is the preferable regulatory and technical approach to determining health-risk impacts.[35]

The results of the air quality analysis in the DEIS demonstrate compliance with all applicable ambient air quality standards, which indicates the project can be implemented with no significant adverse air quality impacts. The conclusion stated in the DEIS that the air quality impacts would be expected to be minor to moderate is not justified and should be updated.

Section 3.2.4.1, Toxic Air Pollutants and Dispersion Modeling Results, page 3.2-18, last paragraph and footnote

The following DEIS discussion of DPM is not indicative of proper risk analysis. The DEIS states,

> *The estimated DPM concentration at the JWC would be between 0.5 and 0.76 μg/m³. At the location of the nearest residential receptor (Fruit Valley Residential Area), the estimated DPM concentration would be between 0.05 and 0.15 μg/m³. The low concentration of DPM at the Fruit Valley Residential Area is anticipated to result in minor air quality impacts to residents in that area. The DPM concentration at the JWC is much higher. However, the duration of housing there is, on average, approximately 18 days for the residents (Bishop, pers. comm., 2015). Although the JWC has higher estimated concentrations of DPM, inhalation of emissions would be experienced less than at residential receptors where residents are present for a large portion of every day, for a number of years. Air quality impacts at commercial and industrial receptors (including staff at the JWC and other worksites in close proximity to the proposed Facility) are therefore expected to be moderate.*

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[34] The DEIS equates annual emissions with potential human health impacts, which reflects a fundamental misunderstanding of health risk-based air quality analysis for criteria pollutants. While annual mass emissions (i.e., tpy) may be used for purposes of screening out actions from needing further regulatory analysis, regulations do not allow inferences regarding air impacts based on annual emissions that do not exceed applicable regulatory thresholds. Rather, impacts are assessed based on projected ambient concentrations of criteria air pollutants (i.e., ppm or μg/m³) and the exposure duration of human receptors (i.e., ppm or μg/m³ over period of years) to such pollutants.

[35] It should also be noted that the dispersion modeling results cited – which comply with the applicable air quality standards – overstate actual potential impacts because the areas of maximum pollutant concentrations tend to occur near the facility in locations that typically are not inhabited.

First, it should be noted that the ASIL used in the DEIS DPM analysis is the applicable screening level for permitting stationary air pollution emission sources. The DEIS correctly notes that ASILs represent impact levels intended to be used during permitting processes for stationary sources. ASILs do not apply to mobile sources. They are an indicator of potential risk of an increase in cancer rates to 1 in 1,000,000 people exposed to a particular pollutant for 70 years.[36] Ecology does not apply ASILs to mobile sources as these sources are not required to be considered during environmental reviews for air permitting purposes. The method of assessment employed in the DEIS leading to a determination of "moderate" DPM impacts at two nearby locations was based solely on the model-predicted very conservatively estimated annual average concentrations of DPM from all operational sources at the project, stationary and mobile.

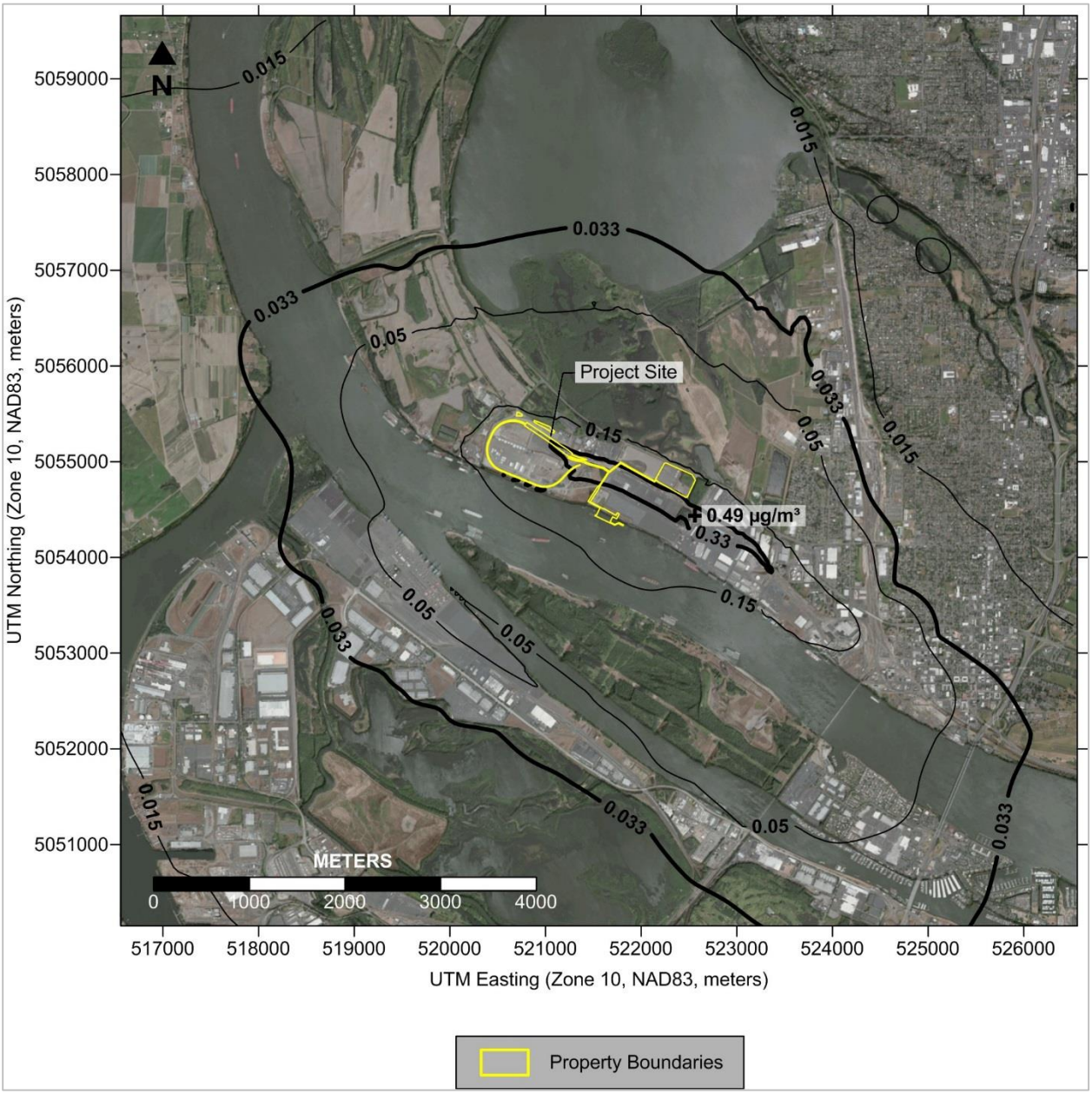
Although Ecology developed the ASILs for application to stationary sources as stated above, the DPM unit risk factor (i.e., the ASIL) is an appropriate risk level factor when used in conjunction with other factors (e.g., ambient DPM concentrations, receptor location and use, meteorological conditions) to estimate potential lifetime exposures and the potential for short-term and/or long-term adverse human health effects. Ecology considers the DPM ASIL to represent a level of negligible health effects, or an indicator of possible health risks if the ASIL is exceeded. However, the ASIL is only one factor in assessing potential risk. Because other factors such as the potential or duration of exposure have not be appropriately considered, there is no rational basis for assigning a minor or moderate impact from DPM based upon model-predicted results from the Applicant. It should also be noted that footnote 5 on page 3.2-18 incorrectly identifies the DPM ASIL as 0.15 μg/m3. The Washington ASIL for DPM is a 0.0033 μg/m3 annual average concentration.

Second, the Applicant employed a number of conservative assumptions in its DPM modeling. Rail and vessel sources were included in the model and on-site locomotives were considered as perpetual emission sources without automatic engine shutdown systems (AESS), which significantly overstated long-term DPM emission rates. The modeling presented in the DEIS assumed on-site locomotives would not use any AESS, although BNSF has estimated that about 98% of its line-haul locomotives would be equipped with AESS and the fleet is likely to be increasingly made up of newer, more efficient models. To demonstrate how conservative the modeling was, the Applicant recently considered a scenario that assumed, based upon BNSF information, AESS would be used and would activate (i.e., shut down the engines) after 10 minutes of idling and affect on-site emissions during product unloading, train personnel changes, and pre-departure air and brake safety testing conducted for each train. These assumptions resulted in a reduction approximating 37% in total annual on-site DPM emissions. Dispersion modeling based on these emissions resulted in commensurate reductions in the maximum estimated PM2.5 concentration and in all other DPM concentrations in the vicinity of the facility. As with the analysis in the DEIS, this example was based on 2016 emission rates. It does not, therefore, reflect probable increasing use of even lower-emitting locomotives likely to

[36] See WAC 173-460-150

occur in the future, which over time would further decrease emissions and off-site concentrations. This significant reduction results from changing only one of the conservative assumptions applied in the original impact assessment. For this reason, we believe the project-related DPM impacts should be considered no more than minor. Figure 1 depicts the results of the "with AESS" modeling calculated annual average DPM concentrations.

Figure 1: DPM concentrations with AESS



The DEIS should be revised to clearly explain the application of impact criteria and why forecast DPM concentrations represent a minor impact within the environmental context of the project area. The DEIS should also correct the ASIL reference in footnote 5 on page 3.2-18.

Section 3.2.4.4, Greenhouse Gas Emissions, page 3.2-29, paragraph 2

The GHG emissions discussed in the last paragraph on page 3.2-29, and reported in Table 3.2-12 on page 3.2-30 are incorrect as explained in the comment to Appendix G, page G-35. The emissions presented in the DEIS overestimate the facility-related GHG emissions anticipated to occur, and therefore underestimate the percent mitigation proposed by the Applicant through their voluntary payment. These errors should be corrected in the FEIS.

Further, although the DEIS recognizes Ecology's guidance regarding the analysis of GHG emissions under SEPA, it omits consideration of means by which the Applicant chose design measures to reduce GHG measures. Section K of Ecology's 2011 guidance (as cited to by EFSEC) states:

> *"If a proponent chooses to mitigate GHG emissions by including energy efficiency or other design features that will reduce GHG emissions, the proponent should quantify and disclose the expected emissions from the project both with and without those design features."*

The Applicant submitted a NOC permit application in February 2014. A subsequent revision to the application was submitted in August 2014. As noted in the cover letter of this submittal[37], several project design revisions were made that resulted in GHG emission reductions. For example, the February 2014 air quality permit application requested approval of full time (8760 hours) use of on-site gas-fired boilers. The modified permit application included restrictions on boiler use that reduced GHG emissions, as well as changes that reduced GHG emissions from the MVCUs. The boilers in Area 300 were replaced with an electrical heat source for the storage tanks. The following table summarizes the overall facility-wide GHG emissions after project design reductions. Note that the DEIS analysis fails to take into consideration the full scope of design changes and resulting decrease in GHG emissions

Document	GHG Emissions, CO2e [US] tons/year							Metric ton/yr	20-yr
	Area 300 Boilers	Area 600 Boilers	MVCU	Comp. Leaks	Tanks	Fire pump	Total		
Feb 2014 ASC	6,420	63,300	80,200	11.9	261	13.5	150,000	136,080	2,721,600
Aug 2014 ASC		44,170	50,530	12	261	14	94,980	86,166	1,723,317
Reported as metric tons/year									
DEIS	63,131		51,913	138	236	12	115,430		2,308,600
Amount too high:									34%

[37] Kelly Flint, 2014, Letter to Stephen Posner, Revised Air Permit Application and Notice of Construction for Tesoro/Savage Vancouver Energy Distribution Terminal ("Vancouver Energy"), EFSEC Application No. 2013-01; Docket EF-131590

The overall reduction of direct GHG emissions from the Facility resulting from the design modifications amounted to more than 36% (i.e., based on changes shown above comparing the February and August 2014 ASCs). This reduction in direct emissions greatly exceeds Ecology's target of an 11% reduction from voluntary project changes. Based on Ecology guidance, this reduction alone suggests the project would not result in a significant impact due to GHG emissions.

This additional emission reduction accomplished through facility redesign should also be factored into EFSEC's consideration of the significance of Vancouver Energy GHG emissions. Statements in the DEIS should be revised to describe the full extent of GHG mitigation measures to be performed by the Applicant and corresponding compliance with the Department of Ecology's SEPA guidance regarding Greenhouse Gas Impacts and Mitigation .

Section 3.2.4.4, Greenhouse Gas Emissions, page 3.2-30, paragraph 1

The DEIS recognizes the Applicant's voluntary commitment to provide monetary compensation to the Climate Trust for mitigation of GHG emissions.[38] However the DEIS states that coordination of such payment would occur though Ecology:

> *The obligation would be met through coordination with Ecology and payment to the Climate Trust at a level commensurate with a 12 percent stationary source reduction.*

The Applicant requests that EFSEC clarify why Ecology would play such a coordinating role when EFSEC not only has jurisdiction over the Facility but also implements its own program as a result of RCW 80.70.

Further, the DEIS fails to state the amount of mitigation payment commitment and that the commitment is limited to the facility stationary source emissions. The public and decision makers are therefore entirely unaware of the value of this commitment unless they review the PDEIS and/or try to calculate the value based on the language in WAC 463-80. The EIS should add the entire mitigation measure as presented by the Applicant in the PDEIS as follows:

> <u>With total annual operational GHG emissions of about 86,184 metric tons (Table 4.2-4), over a 30 year life of the Facility at 12 percent of the total CO2e emissions (i.e., based on the WAC 463-80 mitigation formula that assumes 60 percent capacity operations and 20 percent of total emissions), this amounts to mitigation of 310,270 metric tons of GHGs. This obligation would be met by payment of $496,440 to the Climate Trust for the implementation of projects to reduce GHG emissions. This commitment fully meets the Applicant's voluntarily assumed obligation to mitigate Facility operations GHG emissions.</u>

[38] See Section 4.2.3.2 of the PDEIS (BergerABAM 2014b)

Section 3.2.5, No Action Alternative, page 3.2-32

See comments on Section 2.8.5.2 of the DEIS regarding revisions to the No Action Alternative discussion in each element of the environment to recognize that crude oil will still be transported to West Coast refineries using the same modes of transportation and thus the expected impacts to air from the No Action Alternative are expected to be similar to those for the Facility. In some cases, the distance travelled by rail could be greater under the No Action Alternative than for the Facility and thus the potential for regional air impacts from rail transportation could be similar or greater than identified for the Facility. In the case of potential localized air quality impacts in the immediate vicinity of the facility, transport of any sorts of commodities via trains and vessels under the No Action Alternative is likely to result in impacts similar to those associated with the Facility.

The analysis in Section 3.2 of indirect impacts of extraction of oil and its transportation by vessel and rail fails to adequately assess the No Action Alternative or complete the analysis necessary to directly attribute those purported impacts to this project, as distinguished from baseline conditions and non-project impacts. As indicated in Section 2.6 and 3.14.2.2, the rail corridors are well-established and have been in use for many years. Existing rail traffic will continue and non-project related increases in rail traffic will occur consistent with state projections. Accordingly, rail traffic associated with this facility should not be considered "additional" rail traffic because the railroad is a *common carrier* that maximizes the capacity of its rail lines to serve a variety of customers such that growth in rail traffic would occur under the no-action alternative. More specifically, in the absence of this Project, other entities will continue to use and likely increase the use of the railway corridor to transport crude oil to meet the current demand of West Coast refineries for mid-continent North American crude oil. Indeed, Section 2.8.2.5 specifically acknowledge that West Coast demand *….would require continued transport of crude oil by existing transportation modes (including pipelines, tanker trucks, and rail) from sources to refineries, or from sources to new or expanded crude-by-rail terminals in other West Coast locations…* Nevertheless, this section does not analyze or acknowledge the impacts of this aspect of the no-action alternative. The specific crude oil trains associated with this project do not represent an increase in risk from the no-action alternative and any purported impacts are not directly and specifically attributable to this project. The rail traffic associated with this project does not represent an increase in traffic from the no-action alternative and any purported impacts are not attributable to this project.

Similarly, in the absence of this project, mid-continent North American oil would continue to be extracted to meet the current demand of West Coast refineries for mid-continent North American crude oil. Those impacts would remain, with or without this project.

Finally, with respect to vessel traffic, vessel traffic on the Columbia River is well-established and has occurred over many years. According to the analysis in the DEIS, any purported increase in vessel traffic attributable to the Project would be minor. Existing vessel traffic currently creates these impacts and other increases in non-project traffic will also continue to create them. Accordingly the vessel traffic associated with this project does not create an

impact distinguishable from the no-action alternative such that any purported impacts are not attributable to this project.

Section 3.2.7, Significant Unavoidable Adverse Impacts, page 3.2-2

Estimated project related concentrations that are below levels allowed by ambient air quality standards should *not* be labeled "moderate" impacts and further, should *not* be labeled "significant unavoidable" impacts under SEPA definitions.

Air quality impacts are generally assessed in terms of whether concentrations of air pollutants are higher or lower than ambient air quality standards set to protect human health and public welfare. These standards have been set at levels that United States Environmental Protection Agency and Washington State Department of Ecology have determined will protect human health with a margin of safety, including the health of sensitive individuals such as the elderly, the chronically ill, and the very young. Comparison of estimated air pollutant concentrations with the ambient air quality standards provides the proper basis for assessing potential impacts, and. Project-related concentrations that comply with these standards should not be considered significant.

EFSEC should revise the discussion in the FEIS to apply only comparison of relevant data with the ambient air quality standards when referring to criteria air pollutants and any regulatory-significant impacts related to such pollutants.

Section 3.3 Water Resources

Section 3.3.2.1, Proposed Facility, page 3.3-4, paragraph 7

The DEIS cites water quality information from a 2009 EPA toxics report as "(EPA 2015)". However, the "(EPA 2015)" citation in the references section does not correspond to this report. This citation should be fixed in the EIS.

Presumably the citation was meant to refer to the EPA's 2009 Report "Columbia River Basin: State of the River Report for Toxics," which is cited in the references section as EPA 2009. The proper citation is:

> US Environmental Protection Agency (EPA). 2009. Columbia River Basin: State of the River Report for Toxics. EPA 910-R-08-004. January.

Section 3.3.2.1, Proposed Facility, Figure 3.3-9, Page 3.3-20

Figure 3-3-9 from the 2015 DEIS does not include the shoreline restrictive covenant area located along the shoreline at Terminal 5.

Figure 2, located on page 4 of the Vancouver Energy's 2015 Contaminated Media Management Plan[39], shows the shoreline restrictive covenant area. The DEIS should be updated to reflect the shoreline restrictive covenant area to Figure 3-3-9 and changing the legend to say Deed Restricted Areas to more accurately represent the areas.

Section 3.3.2.3, Vessel Corridor, page 3.3-38, paragraph 4 and Table 3.3-15

The DEIS states that 80 percent of the 143,731 acres included in the vessel corridor is wetlands. This statement is misleading and should be clarified. NWI maps are based on the classification system developed by U.S Fish and Wildlife System in the document titled *Classification on Wetlands and Deepwater Habitats of the United States* (Cowardin *et al.* 1976). The majority of the wetland acreage reported as occurring within the vessel corridor is associated with the riverine, estuarine, and marine systems of the Columbia River mainstem, which are classified as deepwater habitats and have been appropriately described and discussed in the surface water section.

Cowardin et al. (1976) define the boundary between wetland and deepwater habitat in the marine and estuarine systems as the elevation of the extreme low water of spring tide and permanently flooded areas are considered deepwater habitats in these systems. The boundary between wetland and deepwater habitat in the riverine systems lies at a depth of 2 m (6.6 feet) below low water or if emergents, shrubs, or trees grow beyond this depth at any time, their deepwater edge is the boundary (Cowardin et al. 1976).

The FEIS should clarify that the overall reported wetland acreage includes the mainstem of the Columbia River and the Columbia River estuary, and should identify separately the total acreage of deepwater and wetland habitats in the vessel corridor.

Section 3.3.3.1, Proposed Facility and Section 3.3.5, Mitigation Measures, pages 3.3-17, last sentence paragraph 5 and 3.3-55, bullet 2

The recommendations in Sections 3.3.3.1 and 3.3.5 are conflicting and should be reconciled and clarified. Additionally, the requirement to obtain well abandonment forms for all wells ignores the information provided by the Applicant that indicated not all well abandonment forms are available. The former ALCOA operations include a number of production wells at the site. Documentation is available on the abandonment of two of the production wells, however, no information is available on the other wells.

The current recommendation requiring all well abandonment forms be obtained prior to construction is likely to be infeasible because they are not available from any identified sources.

The Applicant made an effort to locate well abandonment forms during preparation of the PDEIS but discovered that information was not available for all wells. Historically, compliance

[39] Included in Appendix D of the DEIS.

with submittal requirements to the database was limited and well abandonment forms may not be available for all wells. For this reason, the requirement to obtain all abandonment records should be eliminated, or modified to require the Applicant, during construction, to investigate all portions of the site being disturbed by Facility construction to confirm that any former boreholes have been sealed. We recommend the following alternative language be included in the FEIS:

> During construction, conduct on-site investigations where production wells were known to be located. If a borehole is located, confirm that the borehole has been properly sealed to a depth at least 10 feet below the finished ground surface with a cementitious grout.

Section 3.3.3.1, Proposed Facility, page 3.3-41 paragraph 3

The DEIS overstates the level of impact to surface water resources during construction, and should be revised to clarify that construction of the facility would result in only minor impacts to surface water quality.

The section of the DEIS that discusses impacts to surface water during construction (Section 3.3.3.1) states that:

> *Short-term disturbance of the Columbia River bed would occur during temporary pile installation and marine terminal improvements. These activities would cause temporary increases in turbidity. Construction BMPs including sediment and erosion controls, such as an in-water boom and curtain, would be deployed if necessary to limit sediment migration downstream.*
>
> *Above-water work would use temporary construction containment and work platforms, which would be built on temporary construction piles to reduce potential releases of construction materials into the Columbia River. Monitoring of water quality during installation and removal of temporary piles would be conducted. Where necessary, construction methods would be modified to protect surface water quality.*
>
> *Construction debris and wastes would be collected and disposed of at an approved location and would not be permitted to enter the watercourse, which would reduce the potential for degradation of water quality from construction of dock modifications*".
>
> *Implementation of the construction BMPs and water quality monitoring described above would limit impacts to surface water during construction to temporary and minor to moderate levels*".

The analysis presented in this section does not support a conclusion of moderate impacts. Impacts to water quality during construction would be temporary in duration, and minimized through the implementation of BMPs as described. This supports a determination of minor potential impacts to water quality as the impacts are *low in intensity, temporary and local in extent* as defined in Section 3.0.3 of the DEIS and the FEIS should reflect this level of impact.

Section 3.3.3.1, Proposed Facility, page 3.3-43, paragraphs 3 and 6

The DEIS analysis indicates potential stormwater runoff from the ground improvement would result in minor to moderate impacts to Columbia River water quality. The conclusion is not supported by the analysis in the DEIS. The DEIS presents a list of mitigation measures proposed by the applicant to reduce the likelihood that ground improvement activities would release contaminates into the Columbia River. The proposed mitigations measures presented in the DEIS include:

- Install temporary sheet pile wall between the jet grout installation areas and the OHWM with sufficient freeboard to contain slurries and spoils and prevent them from entering the Columbia River.
- Sequence the construction of permanent ground improvements such that the first installations nearest to the OHWM become an additional buffer along with the sheet pile wall.
- Provide isolation measures to contain, extract, and dispose of spoils.
- Capture and treat high pH water.
- Conduct water quality monitoring.

The mitigation measures listed above were specified in the applicant's Project Refinement Report dated 27 May 2015. These mitigation measures were listed specifically for the containment and handling of jet grout related spoils. As mentioned in the report the BMPs are in addition to those already included in the Construction Stormwater Pollution Prevention Plan (SWPPP).

The SWPPP dated 27 February 2015 was submitted to EFSEC which identifies additional construction stormwater best management practices (BMPs) to address stormwater within the ground improvement construction areas. The cSWPPP placed specific emphasis in the attached environmental control drawings to protect surface water quality of nearby wetlands and the Columbia River. Downslope and perimeter protection was identified for all construction areas and where ground improvements are necessary. The following specific BMPs were included in the SWPPP.

- Wheel washes would be provided at applicable construction entrances during all ground improvement activities
- Groundwater or jet water used and brought to the surface during ground improvements at the marine terminal would be collected and pumped into weir tanks for turbidity control.
- Silt fencing would be installed along the top of bank where the transfer pipelines and ground improvements are constructed along the river. Compost socks would be installed along river embankment above the OHWM or water line whichever is higher.
- All groundwater or jet grout slurry resulting from ground improvements would be processed through chemical treatment BMPs such as pH reducers and/or polymer assisted stormwater filtration.

- Wick drains will be used between areas of ground improvement (stone columns, soil mixing, jet grouting, etc.) and surface waters and wetlands. At Area 300, wick drains will be installed at a minimum of 16 feet on center where ground improvements are within 150 feet of the adjacent wetlands to the north and east. At areas 400 and 500, wick drains will be installed along the top of bank at 8 feet on center for the entire bank area receiving ground improvement. Visual monitoring of turbidity within the wetlands or Columbia River will occur daily during ground improvement. If any turbidity is observed as a result of ground improvement, ground improvement activities will be stopped and additional mitigation measures will be installed, including additional wick drains, turbidity curtains, or change in ground improvement methods will be considered.
- Cutoff channels would be installed in Area 300 – Storage Tanks along the downslope construction area to capture construction stormwater where existing site grading is insufficient to direct stormwater into conveyances for the construction stormwater. These channels would also be used to contain ground improvement runoff where necessary. Channel lining and check dams would be used to protect channel from erosion, and check dams to assist in flow control.

Section 3.3.3.1 Construction Stormwater should be corrected to reference the construction stormwater BMPs additionally in-place to protect water quality in the vicinity of the ground improvements. The addition of the construction BMPs reduces the impact to water quality from moderate to minor or negligible. The FEIS should include this information and the summarizing recommendation of impacts of construction stormwater to surface water should be corrected to categorize the impact to water quality as temporary and minor.

Section 3.3.3.1, Proposed Facility and Section 3.3.5, Mitigation Measures, page 3.3-49 paragraph 6 and page 3.3-55 last bullet

The DEIS identifies a possible impact to groundwater resources resulting from the installation of ground improvements which may provide new vertical pathways for water and contaminant transport. The specific concern relates to migration of contaminants from the facility which would infiltrate from the surface to the subsurface or through exchange of groundwater between subsurface layers. This DEIS impact discussion is in error because it is based on incorrect information regarding historic production wells.

Additionally, this impact is compounded by the DEIS' assertion that if contaminants were to reach intermediate or deep subsurface zones that the large production wells on-site or in the immediate vicinity could draw these contaminants up-gradient of normal groundwater flows and could possibly comingle with contaminants in the remediation areas.

The DEIS assesses the impact resulting from possible vertical movement and possible up-gradient migration to be minor since the ground improvements would be located by engineering function in areas with structures, impervious surfaces, or caps. Additionally the DEIS agrees that the design elements and operation BMPs for stormwater and spill prevention

control and countermeasures minimize risks of contaminants entering stormwater and would also limit potential for contaminants to reach subsurface groundwater.

As noted above in comments on Section 3.3.3.1, page 3.3-17, the high production wells discussed in the proposed mitigation measure are anticipated to have been decommissioned during the site remediation process. During the final phase of the site cleanup and demolition activities two supply wells were discovered and decommissioned[40]. Clark County GIS database does indicate that there is a wellhead zone for the Alcoa (Vanalco Inc.) wells (Well #700061). The associated high production wells from the Alcoa are believed to have been decommissioned during the site remediation and at a minimum are no longer active. Therefore these high production wells cannot contribute to migration of contaminants.

Clark County GIS[41] indicates that the project site is not located within a public wellhead protection zone. The nearest public well is for the Port of Vancouver's domestic supply and is located approximately 7,700 feet southeast of Area 300. Based upon the 10-year well-head protection zone the well is too far removed from the project site to be affected.

The facility is also located outside of the nearest private wellhead zone which is located approximately 1,200 feet from Area 600. This well is for the West Vancouver Materials Recover Center.

The DEIS summarizes the impacts to groundwater from operations and maintenance activities as minor. Whereas any temporary impacts discussed in the Construction Groundwater section would be temporary ranging from minor to moderate. By engineering design and function ground improvements such as piles, jet grout columns, wick drains, and/or stone columns are not located within contaminated areas identified in the contaminated media locations.[42]

The references in the DEIS regarding the existing high production wells for the former Alcoa facility should be modified to reflect the understanding that these wells are abandoned. Also, the DEIS should be modified to note that by design the project is limiting disturbance within the contaminated media locations to shallow excavations and work within these areas will comply with a contaminated media management plan included in Appendix D to the DEIS.

Section 3.3.3.3, Vessel Corridor, page 3.3-53, paragraphs 1 and 3

The conclusions in the DEIS related to wake impacts on sediments are in error, and inconsistent with the analysis presented. The DEIS should be revised to clarify that the potential for impacts to water quality associated with redistribution of potentially contaminated sediment would be negligible.

[40] Anchor QEA, LLC. December 2009. Project Completion Report, Alcoa/Evergreen Vancouver Site
[41] http://gis.clark.wa.gov/mapsonline/?site=SoilsWetlands
[42] Appendix D.7 of the FEIS (Construction Stormwater Pollution Prevention Plan dated 27 February 2015)

The section of the DEIS that addresses water resources within the vessel corridor (Section 3.3.3.3) states that:

> *Wakes and wave action generated by deep-draft vessels associated with the proposed Facility could impact water quality of the Lower Columbia River by direct turbulence, erosion, sedimentation, and sediment resuspension*

and:

> *Such temporary increases in turbidity and local redistribution of sediment on the channel bed and/or to active channel bars and floodplain surfaces from vessel transits within the Lower Columbia River would not be considerably different from natural geomorphic processes, nor would it be expected to alter the river channel, its hydrology, or water quality relative to baseline conditions, and it would therefore be considered negligible*.

and:

> *Sediments contaminated with PAHs, PCBs, and PBDEs exist along the Lower Columbia River, and vessel traffic remobilization of bed materials may transport and redistribute existing contaminants or temporarily affect localized dissolved oxygen levels. The location, severity, and duration of impacts from remobilization of existing legacy contaminants is difficult to predict but would not be substantially different from impacts from existing and historical vessel movements. However, resuspension of existing contaminants would likely violate water quality standards, at least locally and temporarily, which would not be readily anticipated, prevented, or otherwise mitigated*". The DEIS concludes that "*Therefore, while the incremental impact from vessels associated with the proposed Facility would likely be minor, potential water quality consequences of resuspended contaminants could be moderate.*

These statements are contradictory. If the temporary increases in turbidity and local redistribution of sediment from vessel transits would not be considerably different from natural geomorphic processes, then the potential impacts to water quality associated with redistribution of potentially contaminated sediment would also be negligible.

In addition, the USACE samples sediment from the navigation channel every ten years. The last sediment characterization occurred in 2008 (additional sampling at two locations occurred in 2010/2011). According the sediment suitability determination[43] the data indicates sediment from the navigation channel is ranked "very low", which means that available data "indicates that locations [are] sufficiently removed from potential sources of sediment contamination based on historical information and review of known or suspected contaminated sites near the project area, or there is a limited pathway for contaminants to reach ecological receptors of concern

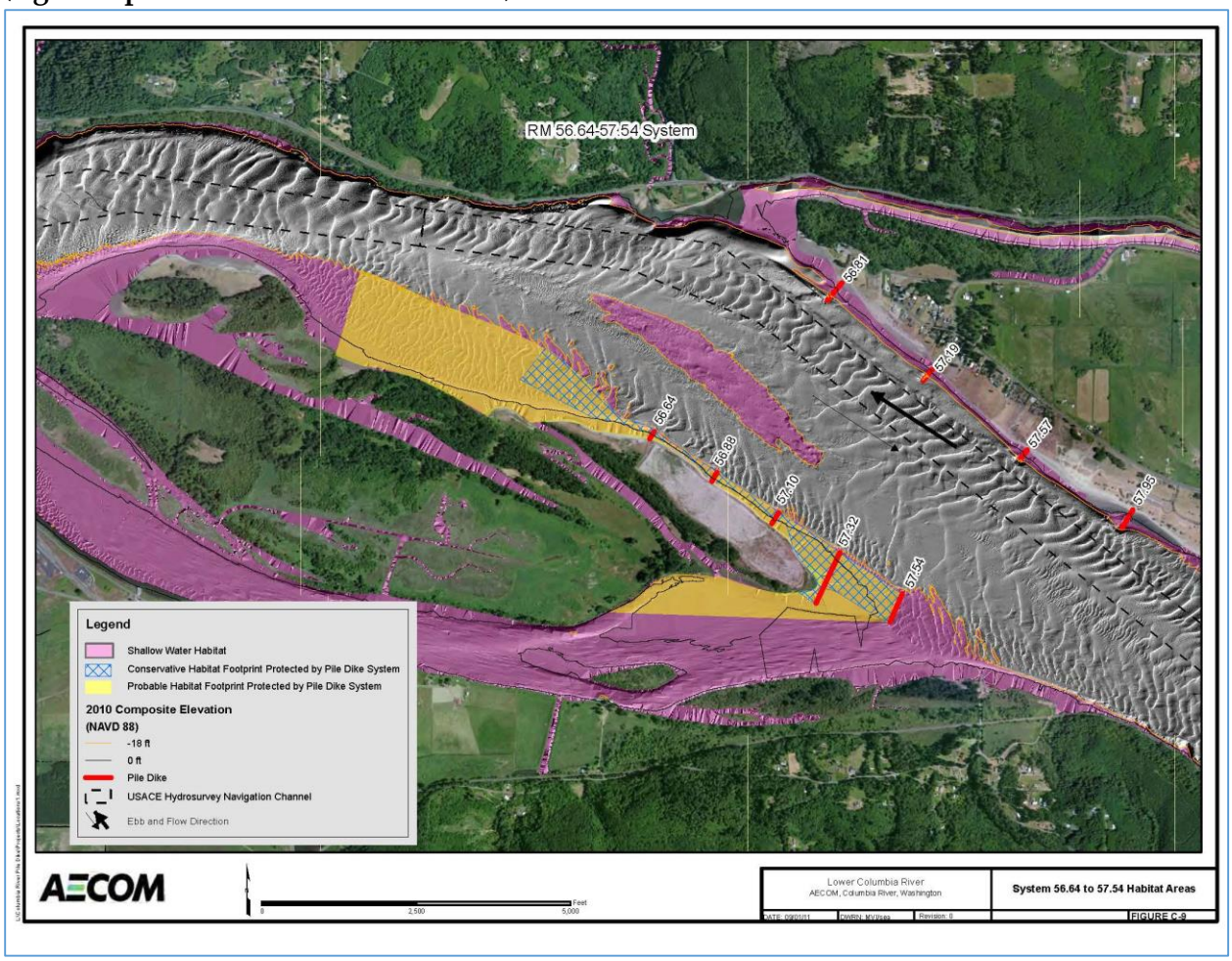
[43] Portland District Dredging Project Review Group (PDDPRG). 2011. The Rose. Dredged Material Suitability Determination for the September 2009 "Columbia River Mainstem Federal Navigation Channel Sediment Quality Evaluation Report and the June 2011 supplemental sediment quality report for the Flavel and Morgan Bar Reaches of the Lower Columbia River (RM 13.3 to 14 and RM 100.7 to 101.3).

based on the Conceptual Site Model. Bioaccumulation is not at a level of concern."[44] The sediment has been determined suitable for in-water placement and new surface material is suitable for unconfined, aquatic exposure. For this reason, any sediment raised by vessels and redeposited, to the extent that this activity would occur, would not be expected to be contaminated at a level of concern, and would therefore have only a negligible effect on water quality.

Further, the substrate surface of the Columbia River is highly dynamic. Even in deep water portions of the river, regular currents and high flow events contribute to a highly dynamic sediment environment, by which an estimated 1.8 million cubic yards of sediment is transported to the Columbia River Estuary annually (AECOM 2011). One visible example of the dynamic nature of the sediment is the presence of sand waves on the river bottom, the product of a continuous supply of sand being transported downstream by river currents. Sand waves cover the majority of the main channel bed from the terminal location to the estuary (Figure 2). In these areas, the river energy maintains a relatively constant bottom elevation, though the surface sand layer is constantly shifting. These factors result in an environment in which sediment is constantly being transported, deposited, and resuspended. This is occurring continuously, naturally, and on a very large scale. As the DEIS mentions, the Columbia River bed is formed by *dynamic sand waves that move a few feet per day under low discharges but may travel nearly 200 feet per day during peak flows* (p. 3.3-33).

[44] U.S. Army Corps of Engineers (USACE) Northwestern Division, et al. Sediment Evaluation Framework for the Pacific Northwest. May 2009.

Figure 1. Typical sand waves visible on the Columbia River main channel bottom surface (figure reproduced from AECOM 2011)



Sand waves are also present at the terminal site (Figure 3). A pile dike immediately upstream of the terminal site somewhat deflects energy away from the shoreline, but bathymetric figures presented in AECOM 2011 indicate that sand waves are present in the immediate vicinity of the proposed berthing area. Therefore, the environment in which the vessels calling at the project site would berth, as well as the river corridor along which it would transit, is a highly dynamic environment.

Sediments along this corridor—as well as any contaminants that may be present—are being resuspended and transported on a very large scale by natural processes. Any resuspension of sediment by wakes from the new vessel traffic would be small and immeasurable in comparison with on-going natural sediment transport processes.

Figure 3: Sand waves visible immediately upstream of the proposed terminal (Figure reproduced from AECOM 2011 overlaid on a Google Earth image.)

Section 3.3.3.3, Vessel Corridor and Section 3.3.6, Significant Unavoidable Adverse Impacts, page 3.3-53, paragraph 2

The DEIS indicates that vessel wakes could impact wetlands along the lower approximately 33 miles of the Columbia River. Section 3.3.3.3 page 3.3-53 states:

> *Wakes from deep-draft vessels also have the potential to impact wetland vegetation communities directly (i.e., breakage, uproot) or indirectly through altered sediment patterns and erosion. The potential for negative effects to wetlands would be limited to the lower approximately 33 miles of the river where shorelines with beaches close to the channel are not shielded from wave action and have beach slopes less than 10 percent. Wake effects would be the greatest as vessels pass through the Columbia River Estuary and its associated habitats including tidal wetlands, shallow water, and tidal flats. The increase in deep draft vessel traffic and associated increase in vessel wakes could have a minor to moderate impact to wetland vegetation, primarily in the Columbia River Estuary.*

Contrary to the conclusion in the DEIS, there is no basis for a conclusion of adverse impacts to wetlands in the lower 33 miles of the Columbia River or to the estuary because, as previously shown, wave energy from vessel wakes does not typically interact with the shorelines in this

reach where wetlands, shallow water, and tidal flats are present (see prior comment on Section 3.1.3.3, page 3.1-24 and 3.6.3.3, page 3.6-53).

In addition, the lower 33 miles of the vessel corridor is currently exposed to vessel wakes from the deep draft vessels and other vessels that use the river. The vessels that would call at the proposed terminal are within the size range of current deep draft vessels and would be piloted at similar speeds. Therefore, the wakes from these vessels would be similar to current wakes. This means the shorelines, which have little susceptibility to erosion (see prior comment on Section 3.1.3.3 page 3.1-24 of the DEIS), would be subject to an incremental increase in vessel wakes of the same type that are not currently causing erosion. It is correct to conclude that there will be more vessel wakes, but there is no basis for concluding there will be erosion impacts in the estuary (lower 33-34 miles of the river) from these wakes that would affect wetlands.

Based on these facts, a conclusion of negligible impacts to wetland is appropriate rather than a conclusion of minor to moderate impacts.

Section 3.3.3.3, Impact Assessment, page 3.3-53, paragraph 4

The section of the DEIS that discusses impacts to surface water resources associated with vessels states:

> *Since vessels calling at the proposed Facility marine terminal would either perform an open-water exchange before entering Washington waters or carry only ballast treated to water quality standards, only negligible impacts would be anticipated.*

However, Section 3.6.3.1 of the Aquatic Species Chapter states that:

> *The potential for salinity changes during discharge of ballast water to affect fish in the area would be minor*

Since vessels calling at the proposed Facility marine terminal would either perform an open-water exchange before entering Washington waters or carry only ballast treated to water quality standards, it is accurate to conclude that only negligible impacts would be anticipated associated with ballast water transfer.

The water quality and aquatic species impacts determinations associated with ballast water management should be made consistent, and should correctly conclude that only negligible impacts would be anticipated associated with ballast water discharge.

Section 3.3.5 Mitigation Measures, page 3.3-54 bullet 1

In identifying additional mitigation measures (specifically the installation of a sediment barrier at the top of the embankment), the DEIS failed to recognize the mitigation measures contained

in the cSWPPP. The DEIS Section 3.3.5, page 3.3-54 bullet 1 identifies a proposed mitigation measure to:

> *Install and maintain an erosion/sediment control barrier along the top of the Columbia River embankment for the areas adjacent to stone column installations consisting of silt fencing, filtration fabric, and straw wattles or similar measures approved by EFSEC. Monitor the water on the river side of the sediment control barrier to ensure the expected level of water quality is maintained. If the water quality on the river side of the barrier is unacceptable, implement additional sediment control measures until the desired level is achieved. These measures would reduce impacts to minor levels.*

The Construction Stormwater Pollution Plan[45] includes placement of erosion/sediment control barriers along the top of the Columbia River embankment for the full extent of the project construction limits. Additionally, where ground improvement may extend below top of the river embankment additional stormwater Best Management Practices (BMPs) were also identified to protect downslope water quality.

Site inspections will be conducted at least once a week and within 24-hours following any discharge from the site and as required by the NPDES Individual Construction Stormwater Permit to be issued by EFSEC. The water quality monitoring plan[46] also identified additional in-stream monitoring within the Columbia River to monitor construction activities.

The NPDES Individual Construction Stormwater Permit is anticipated to include reporting and correction requirements that are substantially similar to those of the Construction Stormwater General Permit[47]. These reporting notifications and noncompliance standards within the General Permit section S5.F require the steps below. Note that for EFSEC issued permits, "Ecology" would be replaced by "EFSEC".

1. Ecology will be immediately notified of the failure to comply.
2. Immediate action will be taken to control the noncompliance issue and to correct the problem. If applicable sampling and analysis of any noncompliance will be repeated immediately and results submitted to Ecology within five days of becoming aware of the violation.
3. A detailed written report describing the noncompliance will be submitted to Ecology within five days, unless requested earlier by Ecology.

The identified mitigation measure requiring erosion/sediment control barriers along the Columbia River embankment should be removed from the additional mitigation measure

[45] Appendix D.7 of the DEIS
[46] Appendix D.5 of the DEIS.
[47] Construction Stormwater General Permit (effective 1/1/2016). http://www.ecy.wa.gov/programs/wq/stormwater/construction/permitdocs/2016CSWGPFinal.pdf accessed 12/17/2015.

section and described earlier in Section 3.3.3.1 Construction Stormwater as an Applicant proposed mitigation.

The resulting impacts to surface water from construction stormwater activities should be reduced from moderate to negligible as identified in the additional mitigation measure text currently included in the DEIS.

Section 3.3.5, Mitigation Measures, pages 3.3-54 to 55

The DEIS identifies two mitigation measures related to the installation of groundwater and surface monitoring wells to monitor for changes in pH and sulfate during jet grouting and stone column installation. The DEIS groundwater monitoring mitigation measure is not supported by the analysis and is not reasonably capable of being accomplished due to construction space constraints.

The first mitigation measure related to groundwater monitoring during jet grouting requires conducting groundwater quality monitoring between the columns and the temporary sheet pile wall. Earlier in the DEIS (Section 3.3.3.1 Construction Groundwater) the impact to groundwater associated with the jet grouting and/or wet or dry soil mixing is identified as limited and localized. The second mitigation measure is specifically for surface water monitoring wells downslope from the stone column and jet grout installation.

In both mitigation measures the requirements for additional construction BMPs such as sheet pile barriers are specifically identified if the monitoring conducted identifies elevated levels of pH and sulfate. The ground improvement design proposed by Hayward Baker dated 14 April 2015 as submitted to EFSEC shows jet grout installation to Ordinary High Water. The Project was refined in the project refinement memo dated 27 May 2015 to include installation of a sheet pile wall landward of the OHWM followed by the jet grout columns.

Installation of the monitoring well(s) between the sheet pile and jet grout columns may interfere with the proposed work due to space constraints as the jet grout columns are needed to meet the facility's seismic criteria. Additionally, this placement of the well would be so close to the jet grout columns that it would more likely monitor the grout itself and not the migration of material from the jet grout through the water. Similarly, as mentioned in the DEIS changes to the soil alkalinity may occur in the localized areas of the installation. The location of the monitoring well between the sheet pile wall and the jet grout columns would not adequately monitor the reductions and effectiveness of the sheet pile wall to minimize the migration of higher pH groundwater.

The stone columns are proposed to be installed upland of the top of the river bank. In order to install surface water monitoring wells downgradient of the stone column installation the monitoring wells would thus be located either within the embankment or below the Ordinary High Water.

For these reasons, the monitoring recommended in bullets 2 and 3 cannot be reasonably accomplished and should be eliminated from the FEIS.

As an alternative to the mitigation measures proposed in the DEIS for conducting groundwater quality monitoring between the jet grout columns and the temporary sheet pile wall and downslope from the stone column and jet grout installation, the Applicant suggests additional monitoring of surface water quality within the Columbia River upstream and downstream of the ground improvement installation to monitor for changes in pH and sulfate levels.

The additional mitigation measures related to flood warnings and modifications to the floor elevation of various facility structures be elevated at least 2 feet above the base flood elevation identified in the DEIS can be implemented as part of final design and confirmed by EFSEC prior to construction plan approval. The final decommissioning plan will verify permanent measures to seal any areas with ground improvements, either by leaving existing impervious surfaces in place (such as the containment area liner), or installing minor additional impervious surface in areas where above-ground improvements are removed without a corresponding impervious surface improvement.

The DEIS mitigation measure regarding verification of abandoned wells is discuss above at Section 3.3.3.1, page 3.3-55 of the DEIS.

Section 3.3.6, Significant Unavoidable Adverse Impacts, page 3.3.55

The DEIS identified as Significant Unavoidable Adverse Impacts:

> *The increase in deep-draft vessel traffic and associated increase in vessel wakes could have a minor to moderate impact to wetland vegetation, primarily in the Columbia River Estuary.*
>
> *While the incremental impact from vessels associated with the proposed Facility would likely be minor, vessel induced resuspension of existing (legacy) contaminated bed sediments in the Lower Columbia River could cause moderate local effects that could violate water quality standards and beneficial uses; the location, timing, or duration of impact cannot be readily predicted.*

As discussed in more detail in the comment to Section 2.8.2.5 above, regarding the inadequacy of the No Action Alternative, the conclusions in this section fail to adequately compare with impacts under the no-action alternative to determine what, if any impact, can be attributed to the project. This potential impact, to the extent that it could occur, would be associated with all deep draft vessel traffic on the river, and would not be unique to project vessels. Additionally, maintenance dredging of the Federal Navigation Channel is an ongoing activity which is conducted to support maritime commerce on the Columbia River. Where the increase in sediment resuspension associated with vessel traffic causing these issues are minor relative to existing ongoing activities, and the impact is occurring under the no-action alternative and in the status quo, the DEIS cannot demonstrate that the impact identified is related or attributable

to the Facility. As such, mitigation under SEPA is not authorized. See SEPA discussion in this comment letter at Section 3.0.3.

The DEIS should clarify that the potential for impacts to water quality associated with redistribution of potentially contaminated sediment would be negligible. As stated above, redistribution of sediment from vessel transits would not be considerably different from natural geomorphic processes sediments within the channel, and sediments in the navigation channel have been deemed suitable for in-water placement.

Section 3.3.6, Significant Unavoidable Adverse Impacts, page 3.3-55

As indicted in comments on Section 3.4.3.3, the analysis of vessel wake impacts is based on a comparison of historic tanker transits from Ecology VEAT data compared to proposed tanker transits associated with the Facility. However, concerning wake effects solely using tanker transits grossly overstates the change in deep draft vessel transits associated with the Facility.

The analysis of vessel traffic in the DEIS is at a high, summary level, not providing the reader enough information about deep draft vessel traffic on the river. Impact conclusions about Facility related wakes (and their percentage of total impacts) are made on the basis of increases in tanker traffic on the river [Appendix J, Table 15].

Facility related vessel traffic should be compared to the current and historical deep draft vessel transits for potential increases in wake effects. Attachment 4-3[48] contains recent trip counts for all vessels on the Columbia River. In doing so, the FEIS should conclude that the Facility's contribution to vessel wakes and vessel wake impacts is negligible or minor in the context of total deep draft vessel traffic generally.

Section 3.4 Terrestrial Vegetation

Section 3.4.1, Methods of Analysis, page 3.4-1, bullet 1

The DEIS includes a study area of one mile around the facility for vegetation due to the potential effects of a spill or fire. This overstates the potential terrestrial vegetation impact area for the reasons described in comments on Section 3.4.2.1, pages 3.4-2 and 3.4-3 below.

Facility fires or explosions would most likely be controlled or contained by the fire suppression systems provided for each respective facility. Furthermore, the Vancouver Fire Department has sufficient capabilities (training, staffing, and equipment) to provide the necessary secondary response to control such an event and prevent fire from spreading to the Fruit Valley Neighborhood and Shillapoo Wildlife Area (see Appendix B to the DEIS).

[48] DNV/GL 2016Vancouver Energy 2014 AIS Traffic Analysis, January 2016.

Section 3.4.2.1, Proposed Facility, pages 3.4-2 and 3.4-3

The DEIS proposes a Facility study area of the project site, including a 1-mile buffer of the proposed Facility because vegetation could be affected within the distance by a spill or fire. The DEIS subsequently lists three vegetation communities, ruderal upland grass/forb, riparian and upland cottonwood stands, and one non-vegetated community, unvegetated industrial, as present within the Facility site. At total of 125.7 acres of vegetation has been calculated for the one mile study area. The proposed Facility itself is approximately 47.4 acres and would require an additional 57.2 acres of temporary disturbance, for a total of 104.6 acres as described in DEIS Chapter 2. The DEIS does not further assess or disclose any vegetation types with the 1-mile study area it proposes and is therefore incomplete.

This analysis is not consistent with vegetation types assessed for wildlife habitats within a 2-mile study area described in DEIS Chapter 3.5 Wildlife. Chapter 3.5 also describes agricultural and pasture vegetation, and emergent wetland vegetation within the general vicinity. These vegetation types are not discussed in Chapter 3.4 of the DEIS.

The DEIS does not consider the full one mile study area it proposes, which should total approximately 4,420 acres.

The DEIS should correct the description of the area studied or correct the description of the vegetation communities to reflect those found within the 1-mile study area.

Finally, as described in comments to chapter 4, it is particularly important to note that there is no support for statements in the DEIS describing purported impacts from spill, fire and explosion events at the facility. The consequences are simply assumed without adequate consideration of the likelihood of those events. As described in Attachments 4-1 and 4-6 (Baker Risk 2016, Wright 2016), the scenarios described are not consistent with how crude oil behaves. The discussion in this section of flammability of crude oil includes errors and overstatements that must be corrected. The facility explosion scenario is improbable.

Section 3.4.2.2, Rail Corridor, Tables 3.4-1 and 3.4-3, pages 3.4-6 and 3.4-10

The DEIS includes an Open Water land cover category in Table 3.4-1 and Table 3.4-3 in its assessment of vegetation within the rail and vessel corridors. Areas of open water are not considered to be vegetated. The DEIS is misleading in its approach that discusses open water as a land cover interchangeably within an analysis that should focus on terrestrial vegetation types.
The DEIS used the USGS GAP national landcover dataset to assess vegetation communities along the rail and vessel study areas. The GAP dataset follows the National Vegetation Classification (NVC) standard, which "excludes non-vegetated natural lands (e.g., rock,

glaciers, some deserts) and waters (e.g., lakes and rivers) and non-vegetated cultural lands (e.g., roads, buildings, mines) and waters (e.g., reservoirs, canals)" (FGDC 2008)[49].

The DEIS should remove consideration of Open Water as a vegetation type.

Section 3.4.3.2, Rail Transportation, page 3.4-15, paragraph 3

The DEIS states that:

> *…increased concentrations of hydrocarbons within the railbed, and potentially within adjacent soils, could result from the transportation of crude oil by unit trains. Review of railway contamination studies in Poland found that contamination next to and between the rails results primarily from exhausted lubricant oils and condenser fluids, transportation of oil derivatives, metal ores, fertilizers and different chemicals, and application of herbicides (Wiłkomirski et al. 2011, 2012).*

The study cited by the DEIS focuses on a narrow range of physical ground where contamination was measured. Specifically, Wilkomirski collected soil samples within the overall rail prism and track ballast. This area of track is typically non-vegetated, but can include patchy vegetation that is often considered weedy and invasive. The Wilkomirski study notes that sampled vegetation species were weedy species, not native vegetation. The DEIS assumes that impacts to vegetation within the rail prism, primarily weedy species, is equivalent in magnitude to impacts to undisturbed native vegetation communities. Wilkomirksi made no conclusion as to pathways that hydrocarbon pollution may take into adjacent, undisturbed native vegetation outside the rail bed. The sample taken from control site away from the rail bed conclude that the contamination does not migrate and contamination is limited to the track bed. Any implication the DEIS makes that hydrocarbon pollution would affect native vegetation is incorrect and misleading.

Furthermore, samples collected from the rail study cited by the DEIS were obtained from a heavily used rail station. While Wilkomirski does not quantify the number of trains through the area, the study refers to the sample area as used by both passenger and freight rail, and includes washing and maintenance tracks. The highest hydrocarbon contamination in the reference study was measured on a siding and at a passenger loading platform. Both locations are indicative of places where trains are stopped and allow more time for hydrocarbon sources to fall onto the track bed. These locations do not correspond well to mainline sections of track where trains are moving through, as they would be in the corridor described in the DEIS.

While the proposed rail corridor described in the DEIS includes passenger and freight traffic, it is not possible to relate a contamination rate per train from the reference study to the proposed project. There is no breakdown of potential hydrocarbon contamination from a single train,

[49] Federal Geographic Data Committee (FGDC). 2008. National Vegetation Classification Standard, Version 2. FGDC-STD-005-2008 (Version 2). Reston, Virginia.

annual loading, or a spill that was not remediated. The DEIS concludes that moderate impacts to vegetation from incremental increases in contamination from small spills by relying on Wilkomirski's assertion the rail traffic increases hydrocarbon concentration. It is not possible to infer the contribution of a single train to soil hydrocarbon concentrations and is therefore not possible to assess a moderate impact from an increase of four trains per day associated with the project.

As explained in more detailed in our comments on Section 2.8.2.5, No Action Alternative, crude oil transportation to West Coast refineries along this same rail corridor is likely to occur with or without the Proposed Action. The impact analysis in Section 3.4.3.2 does not adequately consider the no-action alterative or complete the analysis necessary to directly attribute any purported impact to this project, as distinguished from baseline conditions and non-project impacts. As indicated in section 2.6 and 3.14.2.2 of the DEIS, the rail corridors are well-established and have been in use for long periods of time. The analysis and recommendation do not acknowledge that existing rail traffic will continue and non-project related increases in rail traffic will occur consistent with state projections. Accordingly, rail traffic associated with this facility should not be considered "additional" rail traffic because the railroad is a "common carrier" and maximizes the capacity of its rail lines to serve a variety of customers and growth in rail traffic would occur under the no-action alternative. The trains associated with this Facility are part of a natural fluctuation in rail traffic. The rail traffic associated with this project does not represent an increase in traffic from the no-action alternative and any purported impacts are not attributable to this project.

The Federal Railroad Administration (FRA) requires regular track maintenance to prevent vegetation on railroad property within or immediately adjacent to the track so that it does not become a fire hazard or impair visibility within the right-of-way (49 C.F.R. §213). Regular removal of vegetation within the railroad corridor pursuant to this federal requirement would eliminate the potential for impact to terrestrial vegetation described in this section. EFSEC should consult further with BNSF directly about this topic.

The DEIS should acknowledge that baseline hydrocarbon contamination may be present along the rail, but that is unknown how a single train contributes to pollutant loading. Further, potential soil contamination is expected to be highest with the non-vegetated rail prism and affected species are typically non-native weedy species. The DEIS should conclude that impacts to native vegetation from incremental increases in hydrocarbon contamination are expected to be negligible.

Section 3.4.3.3, Vessel Transportation, page 3.4-16

The DEIS indicates that vessel wakes could impact shoreline vegetation and lead to the spread of invasive weeds based on an incorrectly calculated 223 percent increase in existing traffic levels:

> *…the incremental increase in deep-draft vessel traffic could contribute to moderate, long-term impacts to shoreline vegetation from wake-induced shoreline erosion and spread of invasive wetland and riparian plants.*
>
> *Vessels traveling up and down the Columbia River could assist with dislodging (with wakes) and facilitating waterborne transport of wetland and riparian zone invasive exotic plants, including garden loosestrife, hairy willow-herb, indigo bush, Japanese knotweed, purple loosestrife, reed canarygrass, and saltcedar (Ecology 2015).*
>
> *Wakes and wave action generated by the deep-draft vessels calling on the Facility would be greater than those associated with the smaller vessels historically typical on the Lower Columbia River. Vessels traveling upriver, holding only ballast, would likely generate smaller, less energetic waves than those laden with crude oil. Although the existing shoreline is exposed to vessel wakes as well as wind-driven waves, the expected increase in wave energy from vessels arriving at and transporting crude oil from the proposed Facility may create additional impacts of wakes on shoreline vegetation."*

The DEIS does not support the conclusion that moderate long-term impacts to shoreline vegetation are occurring causing the spread of invasive wetland and riparian plants. Further, there is no basis for concluding that incremental increases in ship traffic would contribute to such impacts because:

- The shorelines are not typically susceptible to erosion and impacts on vegetation (see comment on Sections 3.1.3.3, page 3.1-24)
- Impacts to wetlands particularly where they are abundant in the lower 33 mile of the river are not expected (see comment Section 3.3.3.3, page 3.3-53).
- The conclusion is partially based on an error in calculating the increase in deep draft vessels resulting from the project.

The DEIS assumes that the shoreline is susceptible to erosion from vessel wakes but it does not provide any information to demonstrate there is a risk of it occurring. The information presented above in the cited comments demonstrates that the lower 33 miles of the river has very limited exposure to vessel wakes. The Corps' Channel Deepening EIS (USACE 1999) reported that the natural shorelines of the lower Columbia River (encompassing the vessel corridor for the DEIS) have remained very stable over the past 100 years, consisting largely of erosion-resistant sand, silt, and clay deposits (USACE 1999). Approximately half of the shoreline consists of between RM 21 and 106 are dredge disposal sites which are not natural shorelines and are highly susceptible to erosion (USACE 1999). Many of the dredge disposal

sites are sandy habitats that are frequently disturbed by sand placement (USACE 2016). The disposal sites are subject to wakes, currents, and continual wind waves (USACE 1999). In addition, the entire vessel corridor is exposed to vessel wakes from the deep draft vessels that currently use the river. The deep draft vessels that would call at the proposed terminal are within the size range of current vessels and would be piloted at similar speeds. Therefore, the wakes from these vessels would be similar to current wakes. This means the shorelines, which have little susceptibility to erosion, would be subject to an incremental increase in vessel wakes that are not currently causing erosion. It is correct to conclude that there will be more vessel wakes, but there is no basis for concluding there will be erosion impacts that will uproot exiting native or invasive species.

The reference (Ecology 2015) is a link to Ecology's Non-Native, Invasive, Freshwater Plants website (http://www.ecy.wa.gov/Programs/wq/plants/weeds/index.html), and its relevance appears limited to a list of the invasive species that inhabit wetlands and riparian habitat. The comment lists all species under the category of "Wetland and Riparian Zone Plants", in the order they appear on the website. The reference provides no information or analysis of how vessel wakes interact with these species as a potential impact mechanism.

The DEIS concludes from the 2014 Vessel Entries and Transit (VEAT) data that the:

> *…increase in deep draft vessel transits associated with the proposed Facility (365 per year) would result in an approximately 223 percent increase from the 164 deep-draft transits recorded by Ecology in 2013.*

The DEIS miscalculates the purported increase in deep-draft vessel traffic from the Facility related vessel traffic. Currently, deep-draft vessels make up a significantly higher percentage of the total existing vessel traffic than what is assumed in the DEIS. Because the DEIS mistakenly assumes a smaller number of deep-draft vessel transits in its baseline, it artificially inflates the increase of deep-draft vessel traffic from vessels travelling to and from the Facility. That miscalculation is important because it forms the basis of the conclusions in the DEIS about the impacts of wakes from deep draft vessel traffic.

Contrary to the DEIS conclusion noted above, the number of deep-draft vessels entering the Columbia River in 2013 is significantly higher than the 164 reported in the DEIS. The DEIS appears to mistakenly refer to the total number of tank vessels, rather than the number of all deep draft vessels. Deep-draft vessels include many different types of vessels, including cargo carriers and container ships in addition to tank vessels, the number of deep-draft vessels at any given cross-section of the river on an annual basis is significantly higher than 164 (Attachment 4-3). In addition, the 2014 VEAT data identifies a total of 1,374 transits of cargo and passenger vessels 300 gross tons and larger calling on Columbia River ports in 2014 (Ecology 2014). Combined with the tank ships and ATBs this results in a much greater baseline of existing vessel traffic than cited in the DEIS.

Wake-related effects could occur with all deep draft vessel types and not just tank ships and ATBs (Pearson et. al 2008). The DEIS needs to be revised to accurately characterize the total baseline level of deep draft vessel traffic. The increase of deep-draft vessels calling to the Facility represents only a fraction of the existing deep-draft vessel traffic in the river. The DEIS needs to correct this error because the overstated increase in vessel traffic is the basis for the conclusions about wake impacts.

The DEIS's statement that vessels traveling upriver, holding only ballast, would likely generate smaller, less energetic waves than those laden with crude oil is an oversimplification. The magnitude of vessel wakes in the Columbia River is related to the length, beam, and draft of the vessel and the speed it is travelling through the water (Pearson et al. (2006). This relationship exists because the vessel must displace the water that it travels through. So for two vessels of equal size the ship travelling faster (relative to the water) will displace more water and generate a larger wake than the slower ship. If two ships are going the same speed (relative to the water) a larger ship has more volume (length x width x draft) and will displace more water and generate a larger wake.

Conclusions regarding the relative size of wakes produced by a vessel travelling upstream or downstream are more complicated to consider because of the effects of river current. A ship travelling downstream at 12 knots (relative to the ground) in a 2 knot current is travelling 10 knots relative to the water. A ship travelling upstream at 12 knots (relative to the ground) in a 2 knot current is travelling 14 knots relative to the water. Under these assumptions, for the same size and draft of ship, the upstream bound ship will generate a larger wake. However, a ship travelling downstream could travel faster relative to the ground due to the aid of the current, while a ship travelling upstream could travel slower relative to the ground due the resistance of the current. In this case, the vessel speeds relative to the water could be similar and the magnitude of the wakes could be similar.

In general, ships exporting products will be travelling downstream at close to full draft at possibly a slower speed relative to the water than they will travel at partial draft possibly at a faster speed relative to the water on the upstream trip. Because the factors are varying in opposite directions (i.e., potential speed goes up when draft goes down) it is difficult to conclude whether the wake will be larger on the upstream or downstream trip.
In general, ships importing products will be travelling upstream at close to full draft at possibly a faster speed relative to the water than they will travel at partial draft possibly at a lower speed relative to the water on the downstream trip. In this situation, the factors of speed and vessel draft are varying in the same direction with respect to upstream or downstream travel (i.e., speed goes up and draft goes up on the upstream trip). In this case, the wake is expected to be larger on the upstream trip compared to its downstream trip.

The ships calling on the Facility would be like the situation described for a vessel exiting the river loaded and travelling upstream under partial ballast and no firm conclusion on the size of the wake is possible without more information on vessel speed.

Based on the information above there is no basis for the DEIS to conclude that the vessels calling at the Project would generate different wakes from the current or historic traffic.

Based on these facts, a conclusion of negligible incremental impacts is appropriate rather than a conclusion of an incremental increase in moderate impacts

Section 3.4.4, No Action Alternative, page 3.4-16

This impact analysis does not adequately consider the no-action alternative or complete the analysis necessary to directly attribute any purported impact to this project, as distinguished from baseline conditions and non-project impacts. See more detailed discussion of the No Action Alternative in comments to Section 2.8.2.5, above. As indicated in Section 2.6 and 3.14.2.2, the rail corridors are well-established and have been in use for long periods of time. The analysis and recommendation do not acknowledge that existing rail traffic will continue and non-project related increases in rail traffic will occur consistent with state projections. Accordingly, rail traffic associated with this facility should not be considered *additional* rail traffic because the railroad is a common carrier and maximizes the capacity of its rail lines to serve a variety of customers such that growth in rail traffic would occur under the no-action alternative. The trains associated with this Facility are part of a natural fluctuation in rail traffic. The rail traffic associated with this project does not represent an increase in traffic from the no-action alternative and any purported impacts are not attributable to this proposed project.

Similarly, the DEIS acknowledges that any purported increase in vessel traffic attributable to the Project is minor. Existing vessel traffic currently creates these impacts and other increases in non-project traffic will also continue to create them. The analysis and recommendation do not acknowledge that any purported impacts occur from existing vessel traffic and will increase from non-project related increases in vessel traffic. Accordingly the vessel traffic associated with this project does not create an impact distinguishable from the no-action alternative such that any purported impacts are not attributable to this project.

Section 3.4.5, Mitigation Measures

The Facility mitigation measures described in this section can be implemented during construction plan review.

Section 3.4.6, Significant Unavoidable Adverse Impacts, page 3.4-17

The DEIS identifies as a significant and unavoidable adverse impacts:

> *The incremental increase in rail traffic from the proposed Facility could contribute to moderate, long-term impacts to vegetation from incremental increases in contamination from small spills and in abundance and distribution of noxious and invasive weeds.*

The incremental increase in deep-draft vessel traffic could contribute to moderate, long-term impacts to shoreline vegetation from wake-induced shoreline erosion and potential spread of invasive wetland and riparian plants.

First, as noted above, the DEIS makes several statements about vegetation along the rail corridor that appear to be incorrect, unsupported, or missing key information. Because this analysis is based on incorrect information or assumptions, the underlying conclusions are also in error. For the reasons described above, these impacts are expected to be negligible to minor, not moderate. For the reasons described above, these impacts are expected to be negligible to minor, not moderate.

Second, this impact analysis does not adequately consider the No Action Alternative or complete the analysis necessary to directly attribute any purported impact to this project, as distinguished from baseline conditions and non-project impacts. As indicated in Sections 2.6 and 3.14.2.2 the rail corridors are well-established and have been in use for long periods of time. The analysis and recommendation do not acknowledge that existing rail traffic will continue and non-project related increases in rail traffic will occur consistent with state projections. Accordingly, rail traffic associated with this facility should not be considered additional rail traffic because the railroad is a common carrier and maximizes the capacity of its rail lines to serve a variety of customers such that growth in rail traffic would occur under the no-action alternative. The trains associated with this Facility are part of a natural fluctuation in rail traffic. The rail traffic associated with this project does not represent an increase in traffic from the no-action alternative and any purported impacts are not attributable to this project.

Finally, as discussed in greater detail above, the DEIS incorrectly describes these impacts as significant and unavoidable. The DEIS analysis does not demonstrate a reasonable likelihood of more than a moderate adverse impact to vegetation. The DEIS erred in concluding that any of these impacts is significant.

As noted in prior comments on Section 3.4.3.3 a conclusion of moderate impacts to shoreline vegetation in the vessel corridor is not supported by the analysis in the DEIS. Therefore the FEIS should not include this impact as a significant unavoidable adverse impacts attributable to the deep draft vessel traffic associated with the facility.

Section 3.5 Terrestrial Wildlife

Section 3.5.1, Methods of Analysis, page 3.5.1-1, bullet 1

The DEIS describes a Facility study area as the general project vicinity and areas within 2 miles of the Facility because wildlife is generally mobile and can be affected by noise, disturbance and habitat connectivity. The analysis in the DEIS concludes that noise disturbance associated with construction and operations of the Facility could affect wildlife within of 3,000 feet of the Facility. However, the DEIS does not describe how habitat connectivity can be affected up to 2

miles as a result of Facility construction or operations. The DEIS concludes that construction related impacts to habitat would occur within the Urban and Mixed Environs habitat, which has little to no value as wildlife habitat according to the DEIS. The DEIS does not discuss how this impact could affect habitat connectivity within 2 miles of the Facility. Of the potential impacts described in the DEIS for the Facility, noise disturbance has the furthest reaching effect on wildlife, and is the DEIS already concludes the impact extends only 3,000 feet.

The DEIS should be corrected to explain why a study area of 3,000 feet is considered appropriate for the Facility. The DEIS only explains why a study area of 3,000 feet for noise impacts is appropriate and does not justify why mobility or habitat connectivity should extend the study area to 2 miles.

Section 3.5.3.1. Proposed Facility, pages 3.5-26 and 3.5-27

The DEIS conducted a noise analysis to determine the effects of construction and operational noise from the Facility on wildlife. The DEIS incorrectly uses a day-night noise level for ambient noise (60 dBA) and construction sources (93 dBA) to conduct noise modeling to assess the intermittent nature of loud construction noises.. Day-night noise levels represent a 24-hour average level which does not account for loud intermittent activity.

The impact of construction noise is typically modeled using a maximum noise level (L_{MAX}) for equipment expected to be used during construction to represent the furthest reaching effect of construction noise[50]. In using the day-night noise level, the DEIS incorrectly applies a 24 hour average noise level to daytime construction activities. Construction noise assessments used for Endangered Species Act consultation typically use a L_{MAX} assessment to determine if there would be an impact to listed species.[51] This approach is more appropriate for assessing construction related noise impacts to wildlife.

The DEIS does not consider the research that shows wildlife can become habituated to noise sources over time, in particular where there is established human presence or activity[52]. The proposed Facility would be constructed within a developed port industrial area where noise levels are typically higher than background and have occurred over long periods. Wildlife within, adjacent, or passing through the Port have habituated to high noise levels and are less

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[50] FHWA. 2006. Construction Noise Handbook - Final Report August 2006. FHWA-HEP-06-015. Washington DC.

[51] WSDOT. 2015. Biological Assessment Preparation for Transportation Projects - Advanced Training Manual - Version 2015. Olympia, WA

[52] Federal Highway Administration (FHWA). 2004. Synthesis of Noise Effects on Wildlife Populations. FHWA-HEP-06-016. Washington DC; Pater, L.L., Grubb, T.G., and D.K. Delaney. 2009. Recommendations for Improved Assessment of Noise Impacts on Wildlife. The Journal of Wildlife Management 73(5): 788-795; Lackey, M.A. 2010. Avian response to road construction noise with emphasis on the endangered golden-cheeked warbler. Masters Thesis. Texas A&M University.; and Francis, C.D. and J.R. Barber. 2013. A framework for understanding noise impacts on wildlife: an urgent conservation priority. Frontiers in Ecology and the Environment

likely to be impacted by operation of the Facility. Furthermore, repeated exposure to noise can result in wildlife habituation and result in higher thresholds to elicit a similar response (Pater et. al. 2009).

The DEIS should be updated to include the following noise modeling approach consistent with evaluating loud, intermittent noise sources as described in the Applicant prepared PDEIS on pages 4-83 to 4-84 and excerpted below:

> As described in Section 4.8, peak terrestrial noise generated during impact pile driving has been estimated at a maximum of approximately 110 A-weighted decibels (dBA), measured at 50 feet (FTA 2006). The baseline noise levels associated with the proposed Facility location and vicinity are relatively high, and the terrestrial noise attenuation analysis assumes baseline noise levels similar to those associated with a high density urban area (70 dBA measured at 50 feet). Terrestrial noise from impact pile driving is expected to attenuate to ambient conditions within approximately 5,000 feet from the location of activities related to the Proposed Action.
>
> Most of the terrestrial habitat within 5,000 feet of the proposed Facility location is Urban/Mixed Environs and of low quality and low suitability for terrestrial wildlife species. Vegetated portions of this habitat type are of limited quality and quantity. Species that use these industrialized habitats are generally well adjusted to nearly continuous human presence and activity. Terrestrial habitats at the proposed Facility location represent low-quality foraging habitat for raptor species. If present, these species may avoid habitats near the pile driving activity temporarily, but the foraging habitat in the vicinity is sufficient so that significant, adverse effects on any species are not anticipated.
>
> Temporarily elevated terrestrial noise levels from impact pile driving would extend approximately 5,000 feet beyond the proposed Facility location onto portions of the CRWMB and associated wetlands and forested habitats on the Shillapoo National Wildlife Refuge south of Vancouver Lake.

With consideration of an appropriate construction noise model and research that demonstrates wildlife habituation to anthropogenic noise, the DEIS should conclude that construction noise impacts to wildlife will be minor.

Section 3.5.3.1, Proposed Facility, page 3.5-27, paragraph 1

The DEIS statement that construction noise could reach wildlife habitats within 2 miles of the Facility and affect wildlife using habitats such as the Vancouver Lake Wildlife Area and the Columbia River Wetland Mitigation Bank is inconsistent with DEIS acknowledgment that construction noise would attenuate to background levels within 3,000 feet of the Facility. The DEIS fails to disclose that after attenuation, construction related noise is not distinguishable from background noise and would therefore have no biological effect on wildlife compared to

background noise sources[53]. The biological related effects discussed in the DEIS are only possible within 3,000 feet that could be attributed to construction noise. Outside of 3,000 it is not possible to distinguish whether observed impacts can be attributed to construction sources or background sources. The FEIS should reflect this distance and impacts should be considered minor.

Section 3.5.3.1, Proposed Facility and Section 3.5.5, Mitigation Measures, page 3.5-27, paragraphs 2 and 3 and page 3.5-34, bullet 4

The DEIS acknowledges the Applicant's proposal for wildlife monitoring thresholds of 90 dB and 900 feet, but determines that it may not be adequate on page 3.5-27. This conclusion is not supported by facts or analysis in the DEIS sufficient to reach this conclusion. The DEIS does not include a review of the scientific literature to assess distances or noise levels at which construction activities could affect wildlife.

The Applicant has prepared a Construction Wildlife Monitoring Plan[54] that contains a review of scientific literature and determined appropriate noise monitoring thresholds for construction monitoring. The 90dB and 900 foot distance proposed by the Applicant is thoroughly supported by the scientific literature and can be reliably measured during construction. Furthermore, the DEIS proposes a mitigation measure to establish a threshold for construction noise monitoring without specifying what the threshold is or how it would be determined. It is therefore impossible to infer if the DEIS mitigation measure would be reasonable or achievable. The FEIS should reflect the Applicant prepared monitoring plan.

Section 3.5.3.2, Rail Transportation

The DEIS discusses the impact of rail transportation on wildlife through the increased risk of collisions and barrier effects. The DEIS considers the effect of project related increase in rail traffic by rail segment and expresses it as a percentage increase over existing. The DEIS then concludes the increase in project related rail traffic would have minor to moderate increases in wildlife collision mortality along the rail corridor, which is considered to be significant and unavoidable (DEIS page 3.5-35, paragraph 1). This impact analysis is flawed and does not justify the conclusion that a minor to moderate increase in mortality.

First, the barrier impact is not substantiated. The DEIS notes that railways can create almost impassable barriers for reptiles, amphibians, and small mammals and that the increase in trains will block wildlife movement. This analysis fails to consider the longstanding presence of the rail corridor and that the facility related trains will not contribute to the barrier effect. The species cited (reptiles, amphibians and small mammals) are primarily affected by the physical rail corridor and not the trains themselves.

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[53] WSDOT. 2015. Biological Assessment Preparation for Transportation Projects - Advanced Training Manual - Version 2015. Olympia, WA

[54] BergerABAM. 2015. Vancouver Energy Construction Wildlife Monitoring Plan. Vancouver, WA.

Second, the DEIS fails to consider existing rail traffic and non-project related increases in rail traffic related to collisions, yet the DEIS does acknowledge the overall growth in rail traffic according to the Washington State Rail Plan (DEIS page 3.5-31, paragraph 3). The DEIS does not consider that the rail corridors are well established and have been in use for long periods of time, with fluctuating volumes of rail traffic that have occurred and will occur with or without the project. The rail traffic attributable to the project falls within the range of historic volumes and the DEIS statement that the proposed facility would incrementally increase train traffic above historic levels is not correct. Thus, conclusions that project-related wildlife collisions are a moderate impact are overstated and should be corrected to minor or negligible, since the number of trains, including project rail traffic would not exceed historic levels. EFSEC should consult with BNSF regarding additional information on rail traffic/wildlife impacts.

Third, the DEIS relies heavily on a rail-wildlife study completed within a national park that focused on an 82 miles section of track (Dorsey 2011), and incorrectly extrapolates those conditions as present within the entire 1,187 mile rail corridor within and outside Washington. On page 3.5-32, the DEIS cites a single study of train-wildlife collisions on the Canadian Pacific Railroad through Banff and Yoho National Parks to establish annual wildlife collision rates with train. Using this selected data from protected lands, the DEIS assumes there is a uniform strike rate along the entire corridor that is comparable to this source. The DEIS does not consider the developed (such as cities or intense agriculture) nature of the corridor that can deter wildlife presence. In fact, the conditions present within the reference study correspond to protected lands with a status of 1, 2, or 3 (DEIS Tables 3.5-4 and 3.5-8). Within the Washington rail corridor, protected lands account for approximately 4 percent of the entire corridor (DEIS Table 3.5-4). Outside of Washington, protected lands account for approximately 20 percent of the corridor. While it is generally agreed that wildlife abundance is generally higher and there is less human influence on behaviors within protected lands, and subsequently there is likely to be higher collision rates, the DEIS should reflect that this is not the case for the entire corridor.

Dorsey (2011) suggests that collision rates are based on a variety of factors, including abundance and behavior among others. The study area focus of a national park suggests that the observed strike rates correspond to high wildlife abundance and normal behaviors. The reverse case must then also be true, where there is low abundance and non-normal behaviors, collision rates should be lower. Land cover types associated with human use (developed, agricultural, and recently disturbed or modified) generally exhibit lower wildlife abundance, restricted movements, and non-normal behaviors influenced by human presence, accounts for approximately 56 percent of the rail corridor in Washington (DEIS Table 3.4-1[55]). Similarly, outside of Washington these lands cover types account for approximately 45 percent of the rail corridor. Within these developed areas, wildlife collisions are expected to be minimal, and the proposed increase of up to 8 trains per day should not measurably change the collision frequency in these areas.

[55] The DEIS includes an open water category in Table 3.4-1 as a land cover type. The 56% calculation includes open water as it is not considered to be an area of high terrestrial wildlife abundance.

Section 3.5.5, Mitigation Measures, page 3.5-34

The mitigation presented in the second bullet may not be feasible if prohibited for security reasons by USCG regulations. The measure should be revised as follows:

> *Only use marine terminal loading area spot lighting during loading operations* <u>if approved by the USCG in compliance with 33 CFR Part 105 and/or Part 154</u>

Section 3.5.5, Mitigation Measures, page 3.5-34, bullet 3

The mitigation presented in the third bullet is not warranted and not supported in the analysis in the DEIS. In addition the mitigation does not specify a specific action that is necessary to address a specific impact (see comments on Section 3.5.3.1 above). The following mitigation measure should be removed from the FEIS:

> *Finalize the Construction Wildlife Monitoring Plan in consultation with EFSEC and WDFW and implement all recommended measures to reduce impacts to wildlife including development of final noise threshold levels, monitoring distances, and adaptive management actions.*

Section 3.5.5, Mitigation Measures, page 3.5-34, bullet 4

The mitigation presented in the third bullet is not warranted and not supported in the analysis in the DEIS. In addition the mitigation does not specify a specific action that is necessary to address a specific impact (see comments on Section 3.5.3.1 above).

The mitigation measure identified in the fourth bullet is not supported by the DEIS analysis. Because there is no specific impact identified the following mitigation measures should be removed from the FEIS:

> *Measure noise levels during construction in the unloading and office area, the storage area, and the marine terminal (Areas 200, 300, and 400, respectively) including impact pile driving and ground improvement installation. If measured noise levels at the established distances exceed the established threshold, perform adaptive management actions, which could include additional noise monitoring at the nearest sensitive resource, using noise dampening strategies for impact pile driving such as placing nylon or wood blocks between the pile and hammer, and using temporary sound barriers such as containers, earthen berms, or stockpiled materials around the ground improvement area*

Section 3.5.5, Mitigation Measures, page 3.5-34, bullet 5

The construction noise mitigation measures described in this section are not warranted because the construction noise impacts to wildlife are expected to be no more than minor. The FEIS should remove the mitigation measure in the fifth bullet on page 3.5-34:

> *Retain old wood pilings, or check wood pilings for cavities used by purple martins before removing them. The removal of creosote-coated pilings that contain purple martin nest boxes or cavities used by martins should be coordinated closely with WDFW.*

No purple martin or nest boxes would be directly affected by the Proposed Action. The Proposed Action does not include removal of any creosote –coated wood piling. All existing piles at the marine terminal are steel and do not contain cavities for nesting wildlife. There would be removal of steel piles, using vibratory methods within the in-water work window, but this would not affect purple martin nests. Furthermore, purple martin have a low suspected occurrence within the Facility site as noted in DEIS Table 3.5-3.

Section 3.5.5, Mitigation Measures, page 3.5-34

The other terrestrial wildlife mitigation measures proposed for the Facility in the DEIS, including tree removal outside of the nesting season, monitoring survival of landscape plantings, managing food waste disposal, and incorporating unloading facility design elements to discourage roosting can be implemented during construction plan review.

Section 3.5.5, Mitigation Measures, page 3.5-34, last paragraph

The DEIS proposes the following rail corridor mitigation:

> *EFSEC also recommends that BNSF identify and monitor wildlife-train collision and barrier hotspots along the rail corridor to determine whether current and projected levels of traffic would result in levels of mortality or barrier effects that would jeopardize the status of local wildlife populations. If significant levels of collision mortality and barriers to wildlife movement are identified, suitable wildlife crossing structures and other measures, such as fencing should be considered as appropriate. BNSF should consult with WDFW and USFWS or a Technical Advisory Committee in designing approaches to identify and monitor hotspots and in identifying suitable crossing structures and other measures.*

The DEIS makes several statements about impacts to wildlife along the rail corridor that appear to be incorrect, unsupported, or missing key information. Because this analysis is based on incorrect information or assumptions, and additionally are impacts associated with rail traffic generally and not Facility-specific traffic, the underlying conclusions are also in error. EFSEC should consult with BNSF directly about this topic.

The implementation of fencing as a migration measure conflicts with the DEIS analysis of wildlife barriers. The DEIS states that moving trains block wildlife crossings at a given point and represents a moving barrier. This implies that any barrier effects of a train is temporary and only occurs when a train is present. When trains are not present, wildlife are able to move normally and unimpeded. Construction of a fence would represent a permanent barrier to wildlife movements and could alter wildlife movements over a larger area. The DEIS should remove this mitigation measure as BNSF operations are not part of the project proposal and the proposed mitigation measure may, in fact, have greater impact on wildlife mobility than the train itself.

Finally, this is an example of a proposed mitigation measure is likely preempted under federal law, as discussed in Section 3.0.4 above. Accordingly, EFSEC does not have authority to require this mitigation measure.

Section 3.5.6, Unavoidable Adverse Impacts, page 3.5-35

The DEIS identifies the following as a significant unavoidable adverse impact:

> *The incremental increase in Project-related rail traffic would likely contribute a minor to moderate increase in wildlife collision mortality, including to predators and scavengers that may be attracted to the rail corridor by the increased availability of carcasses from animals hit by trains.*
>
> and,
>
> *The incremental increases in Project-related rail traffic could contribute to minor to moderate long-term impacts to terrestrial wildlife from incremental increases in barrier effects and minor increases of small quantities of contaminants.*

See the discussion above regarding these impacts and associated mitigation measures. These impacts are not significant, are not specifically attributable to the project rail traffic as distinguished from rail traffic generally and any such impacts would occur under the No Action Alternative. The DEIS analysis does not demonstrate a reasonable likelihood of more than a moderate adverse impact related to wildlife collision mortality, wildlife barrier effects, or minor increases of small quantities of contaminants on environmental quality. For these reasons, these statements regarding significant unavoidable adverse impacts should be removed from the EIS.

Section 3.6 Aquatic Species

Section 3.6.2.2, Species Presence in all Study Areas, pages 3.6-16, 3.6-25, and 26, and Tables 3.6-3 and 3.6-6

Table 3.6-6 in the DEIS is intended to indicate potential non-listed fish species presence in the study areas for the project. The table includes six fish species included in the Arrowtooth

Flounder Subgroup and indicates that these species are not expected to be present within the study area for the facility, rail corridor, or vessel corridor. Table 3.6-6 is also intended to document flatfish use of the project vicinity and vessel and rail corridors in Washington. The table indicates, within the Arrowtooth Flounder Subgroup, the potential presence of juveniles and adults within the vessel corridor.

The analysis presented on DEIS, page 3.6-26 states that:

> *All life-history stages of species in the Arrowtooth flounder group are predominantly found on the continental outer shelf and continental slope. However, some occurrence records exist of adults of these species in waters off of the Columbia River mouth, although at depths below those found within 3 miles of the river mouth*"

This indicates that these species should not be expected to occur within the vessel corridor. There is a discrepancy between this statement and the table that needs to be corrected. Arrowtooth flounder are marine fishes and are not expected to occur within the vessel corridor.[56]

The FEIS should reflect revisions to Tables 3.6-3 and 3.6-6 for consistency with each other and with the analysis presented on page 3.6-26 of the DEIS.

Section 3.6.2.3, Marine Mammals, pages 3.6-32 and 34, and Table 3.6-8

Table 3.6-8 in the DEIS claims that Northern elephant seal (*Mirounga angustirostris*) could potentially be present within the project vicinity, vessel corridor, and rail corridor. This is not correct. The project vicinity and rail corridor are outside this species' range. Table 3.6-8 also claims that Northern fur seal (*Callorhinus ursinus*) could potentially be present within the project vicinity and vessel corridor. This is not correct. The project vicinity and rail corridor are outside this species' range. [57]

Northern elephant seal and Northern fur seal are not known to occur within the portion of the Lower Columbia River that is within the project vicinity or rail corridors[51]), and the analysis presented in page 3.6-34 regarding life history of these species does not present information on why these species would be expected to occur in these portions of the study area. EFSEC should revise Table 3.6-8 and the analysis presented on page 3.6-34 to reflect the fact that northern

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[56] Kaplan, I.C., and Helser, T.E. 2007. Stock assessment of the arrowtooth flounder (Atheresthes stomias) population off the west coast of the United States in 2007. Status of the Pacific Coast Groundfish Fishery through 2008, Stock Assessment and Fishery Evaluation: Stock Assessments, STAR Panel Reports, and Rebuilding Analyses. Pacific Fishery Management Council, Portland, Oregon.

[57] Carretta, J.V., E. Oleson, D.W. Weller, A.R. Lang, K.A. Forney, J. Baker, B. Hanson, K. Martien, M. Muto, A. J. Orr, H. Huber, M. Lowry, J. Barlow, D. Lynch, L. Carswell, R. Brownell Jr.,, and D.K. Mattila. 2014. U.S. Pacific Marine Mammal Stock Assessment: 2013. NOAA Technical Memorandum NOAA-TM-NMFSSWFSC-532 La Jolla, CA.

elephant seal and northern fur seal would only potentially occur within marine portions of the vessel corridor.

Section 3.6.3.1, Proposed Facility, page 3.6-41, paragraph 2

The section of the DEIS that addresses vibratory pile installation and removal states that effects to fish from underwater noise generated from [in-water vibratory] pile driving would be moderate. However, the effects analysis presented in this section of the DEIS does not support this conclusion.

The analysis presented in the DEIS correctly states that:

> *Vibratory pile driving associated with insertion and removal of the 40 temporary support piles would lead to a temporary increase in underwater noise levels in the proposed Project vicinity, which could cause behavioral avoidance but is unlikely to cause injury.*
>
> and,
>
> *All in-water pile driving would occur during an in-water work window to minimize impacts to juvenile ESA-listed salmonids and peak run timing of adult salmonids and eulachon spawning and migration.*

The potential for temporary behavioral disturbance during an in-water work window timed to avoid peak presence would not rise to the threshold for moderate impacts established in the EIS, and should be considered a minor impact to aquatic species. The National Marine Fisheries Service and US Fish and Wildlife Service have not established an underwater injury threshold for ESA-listed fish species associated vibratory pile driving.[58]Vibratory hammers generally produce less underwater noise than impact hammers, and are considered to be a mitigation measure to reduce the potential for adverse effects on fish that would otherwise be associated with impact pile driving[59].

In the context of Endangered Species Act (ESA) consultation, National Marine Fisheries Service and US Fish and Wildlife Service do not typically consider temporary effects associated with in-water vibratory pile installation to represent take of an ESA-listed fish species, and as a result do not typically include this type of construction activity as part of the incidental take statement. The Biological Evaluation prepared for this project (BergerABAM 2014) documents that this activity "may affect, but is not likely to adversely affect" any ESA-listed fish species.

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[58] Fisheries Hydroacoustic Working Group (FHWG). 2008. Agreement in principle for interim criteria for injury to fish from pile driving activities. Memorandum dated June 12, 2008.

[59] Buehler, David, R. Oestman, J. Reyff, K. Pommerenck, B. Mitchell. 2015. Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish. CALTRANS Report # CTHWANP-RT-15-306.01.01. November 2015.

The FEIS should clarify that impacts associated with vibratory pile driving and removal conducted during the approved in-water work window would result in only minor impacts to aquatic species.

Section 3.6.3.1, Proposed Facility, page 3.6-37 paragraph 3; and Section 3.6.5, Mitigation Measures, page 3.6-57, bullet 3

In the Applicant-prepared PDEIS for the project, and in the JARPA and Biological Evaluation (BE) for the project, the Applicant has proposed to conduct work below the Ordinary High Water Mark (OHWM) within the US Army Corps of Engineers' (USACE) published in-water work window for the Columbia River mainstem between the mouth of the river to the Snake River confluence (November 1–February 28).[60] This work window has been established by the USACE, in coordination with resource agencies, for the protection of fish life, including ESA-listed species.

In Section 3.6.3.1 of the DEIS, EFSEC proposes a modified in-water work window of September 1 - January 15 to avoid peak migration and larval stages of salmonid and nonsalmonid species. This EFSEC-modified in-water work window is also included as a mitigation measure in Section 3.6.5 of the DEIS.

The USACE is currently reviewing the JARPA and BE for the project and consulting with National Marine Fisheries Service (NMFS) and US Fish and Wildlife Service (USFWS) as obligated under Section 7 of the Endangered Species Act (ESA). Each of these regulatory agencies may have additional feedback on the preferred window for in-water work.

In the absence of a consensus among the resource agencies regarding a modified work window, EFSEC should defer to the USACE-published in-water work window of November 1 – February 28, and the analysis in the DEIS should be based upon this window, as this is the window under consideration with the federal permitting agencies.

If USACE, NMFS, USFWS, and EFSEC can agree upon a modified window in which the project can be accomplished, and which is no shorter in duration than the window proposed in the federal permit application, then the Applicant would support discussions regarding a modified in-water work window.

[60] U.S. Army Corps of Engineers. (USACE). 2015. Approved Work Windows For Fish Protection For Waters Within National Park Boundaries, Columbia River, Snake River, And Lakes By Watercourse. Available at: http://www.nws.usace.army.mil/Portals/27/docs/regulatory/ESA%20forms%20and%20templates/work_windows%20Waters_in_NPs_CR_SR_Lakes.pdf

Section 3.6.3.1, Proposed Facility, page 3.6-42, paragraph 6

The DEIS overstates the impact to aquatic species from water quality impacts during construction as minor to moderate, but the analysis does not support this determination. The DEIS should clarify that the Applicant has committed to adhere to the Applicant-proposed BMPS and to an EFSEC-approved cSWPPP, the impacts to aquatic species associated with temporary water quality impacts during construction should be considered minor.

The DEIS includes a discussion of Applicant-prepared BMPs that would be implemented during construction to avoid and minimize impacts to water quality during construction. The sections of the DEIS that impacts to aquatic species associated with temporary water quality impacts during construction correctly identify that:

> *The Applicant has proposed daily monitoring for turbidity and weekly monitoring for pH during concrete pouring and curing; monitoring for turbidity, sediment, and pH in stormwater discharges from the site during construction; and adherence to an EFSEC-approved SWPPP.*

The DEIS does not adequately reflect that commitment to adhere to BMPs and an EFSEC approved SWPPP. The DEIS recognizes that the Applicant proposed BMPs are intended to prevent pollution and any impacts are expected to be limited and localized. Yet, without explanation, due only to the assertion that the effectiveness of these measures to protect water quality and fish during construction are uncertain, the DEIS then overstates the degree of impact as minor to moderate. This characterization is not consistent with the risk/impact rating scheme discussed at the beginning of chapter 3 and should be revised to "minor." Impacts to water quality from small spills and leaks of hazardous materials are expected to be minor if an EFSEC-approved cSWPPP and Applicant-proposed BMPs to prevent contamination of surface waters are adhered to during construction activities.

Since the Applicant has committed to adhere to the Applicant-proposed BMPS and to an EFSEC-approved SWPPP, the impacts to aquatic species associated with temporary water quality impacts during construction should be considered minor, not "minor to moderate". The FEIS should clarify the Applicant's commitment and the impact analysis revised accordingly.

Section 3.6.3.1, Proposed Facility, page 3.6-44, paragraph 2

The section of the DEIS that addresses vibratory pile installation and removal correctly states that underwater noise associated with vibratory pile driving could exceed the 120 dB RMS disturbance threshold established by NOAA. The DEIS also correctly notes that the project proposes to implement a marine mammal monitoring plan during pile installation and removal activities. The DEIS concludes that impacts to marine mammals are expected to be minor to moderate.

The minor to moderate impact determination does not take into account the implementation of the Applicant's Marine Mammal Monitoring Plan (Appendix D-10 of the DEIS) to avoid exposing marine mammals to underwater noise above the 120 dB RMS disturbance threshold. Since marine mammals will not be exposed to levels of underwater sound that exceed the threshold, the impacts associated with underwater noise would not rise to the threshold for moderate impacts established in the EIS, and should be considered only a minor impact to marine mammals. The FEIS should clarify that impacts associated with pile driving conducted pursuant to the Marine Mammal Monitoring Plan would result in only minor impacts to marine mammals.

Section 3.6.3.3, Vessel Transportation, page 3.6-50, paragraph 3

This section of the DEIS, which addresses water quality impacts to invertebrates associated with operation and maintenance of the Facility states that propeller scour from vessels and escort tugs could result in impacts to benthic communities through disturbance of sediments on the river bottom, and goes on to conclude that propeller scour could impact both the deeper water areas in berth and vicinity and in adjacent shallow nearshore habitats, and could cause a "localized minor but long term change in the benthic community".

However, this assessment does not account for the dynamic nature of the Columbia River, and the natural movement of sand and benthic material that occurs in the system, in which sand waves are continuously forming and reforming, and benthic material is continuously being moved through the system. In deep water portions of the Columbia River, including the Federal Navigation Channel, regular currents, high flow events, and sediment bedload transport all contribute to a highly dynamic deep water environment. In addition to effects related to reduced light penetration in deep water, areas with dynamic bedload typically express reduced biological productivity due to limited sediment stability and the insufficient buildup of detritus and fine material[61]

It also fails to account for the fact that the berth already receives vessel traffic, and that benthic habitats in and adjacent to the berth are already exposed to a baseline level of propeller scour. The potential for benthic invertebrates to colonize areas exposed to strong currents is challenged by the risk of burial due to accretion and the risk of scouring due to erosion in these dynamic habitats. For example, Corophium salmonis (a benthic prey item for salmonids) occurs over a variety of depths of substrate types throughout the vessel corridor of the Columbia River, but densities of this amphipod species are negatively correlated with increasing depth and positively correlated with increasing percent of silt and silt[62]. Together,

[61] McCabe, G.T., Jr., S.A. Hinton, R.L. Emmett, and B.J. Sandford. 1997. Benthic invertebrates and sediment characteristics in main channel habitats in the lower Columbia River: Northwest Science 71:45-55.

[62] Observed in samples taken between RM 75 and RM 131, McCabe et al. 1997

these factors contributed to reduced productivity in the deep water channel and berth areas of the vessel corridor.

As a result, any localized minor change in benthic disturbance would not be expected to result in a long term change to the benthic community, since the benthic environment at the site exists in a state of regular disturbance. In addition, vessel traffic in the navigation channel and in the berth will disturb physically dynamic habitats that are continually disturbed by natural currents. The impact of vessel traffic on these habitat should be negligible.

The FEIS should clarify that impacts associated with propeller scour from vessels and tugs could result in a minor impact to water quality, it would not represent a long term change to the benthic community.

Section 3.6.3.3, Vessel Transportation, page 3.6-51, paragraphs 1 and 2

The DEIS Section 3.6.3.3, page 3.6-51 indicates that vessel wakes from the project vessels could impact fish habitat:

> *Effects to habitat types present in the vessel corridor would primarily result from vessel wake or from leaks of fuels or lubricants from transiting vessels. Localized reductions of existing vegetation, prey, and overall juvenile fish habitat function could occur from wakes during vessel transit. Vessel wakes have the potential to impact riparian and wetland vegetation communities directly (i.e., breakage, uproot) or indirectly through altered sediment patterns and erosion. Damage to existing vegetation could impact juvenile fish that utilize this habitat for foraging and resting. Effects from vessel wake are more common in the presences of deep-draft vessels.*
>
> *The increase in deep-draft vessel transits[10] associated with the proposed Facility (365 per year) would represent an approximately 223 percent increase from the 164 deep-draft transits recorded by Ecology in 2013 (Ecology 2014). While this percentage increase is substantial, the potential for negative affects to habitats would be limited to the lower river (approximately 33 miles) of the Columbia River where shorelines with beaches close to the channel are not shielded from wave action and have beach slopes less 10 percent. Wake effects would be the greatest as vessels pass through the Columbia River estuary and its associated habitats including tidal wetlands, shallow water, and tidal flats. The habitat types in these areas serve as important nursery grounds for juvenile fish. The increase in deep-draft vessel traffic and associated increase in vessel wakes could reduce the vegetation communities in these areas, resulting in a moderate to major long-term change to the resource, indirectly affecting fish species that rely on these habitats to complete their life cycle.*

There is no basis for concluding that incremental increases in ship traffic would result in moderate to long-term impacts long-term impacts to wetland or riparian vegetation and affect the fish species that rely on these habitats for the following reasons:

- The shorelines are not typically susceptible to erosion and impacts on vegetation (see comment on Sections 3.1.3.3, page 3.1-24).
- Impacts to wetlands and other complex habitats particularly where they are abundant in the lower 33 mile of the river are not expected (see comment 3.3.3.3, page 3.3-53).
- The increase in deep draft vessel transits is overstated (see comment 3.4.3.3, page 3.4-16).

The comments on Section 3.1.3.3, page 3.1-24 and 3.6.3.3, page 3.6-53 explain how the analysis of effects of several section of the DEIS are based on a misunderstanding of a study of wake stranding of juvenile salmon[63]. The DEIS is incorrect in focusing on stranding impacts in "the lower 33-mile portion of the Columbia River". Further, it is incorrect to extrapolate from the erroneous stranding conclusions for the lower 33 miles of the river to evaluate the potential for impacts to other shoreline resource because the conclusion of Pearson et al. (2008) is that wave energy from vessel wakes seldom reaches the shoreline in the lower 33 miles of the river. Therefore, there is no rationale to conclude vessel wakes strand fish or that vessel wakes cause other effects in the "lower 33-mile portion of the Columbia River" or the estuary.

The DEIS assumes that the shoreline is susceptible to erosion from vessel wakes but it does not provide any information to demonstrate there is a risk of it occurring. The information presented above in the cited comments demonstrates that the lower 33 miles of the river has very limited exposure to vessel wakes. The Corps' Channel Deepening EIS (USACE 1999) reported that the natural shorelines of the lower Columbia River (encompassing the vessel corridor for the DEIS) have remained very stable over the past 100 years, consisting largely of erosion-resistant sand, silt, and clay deposits (USACE 1999). Approximately half of the shoreline consists of between RM 21 and 106 are dredge disposal sites which are not natural shorelines and are highly susceptible to erosion (USACE 1999). Many of the dredge disposal sites are sandy habitats that are frequently disturbed by sand placement (USACE 2016). The disposal sites are subject to wakes, currents, and continual wind waves (USACE 1999).

Finally, the entire vessel corridor is currently exposed to vessel wakes from the ships that use the river. The vessels that would call at the proposed terminal are within the size range of current vessels and would be piloted at similar speeds. Therefore, the wakes from these vessels would be similar to current wakes. This means the shorelines, which have little susceptibility to erosion, would be subject to an incremental increase in vessel wakes that are not currently causing erosion. It is correct to conclude that there will be more vessel wakes, but there is no basis for concluding there will be erosion impacts in the estuary (lower 33 -34 miles of the river) from these wakes that would affect complex habitats and as noted in comments on Section 3.4.3.3 above, the increase in vessel traffic of 223 percent is not an accurate statement when addressing vessel wakes. Further, impacts upstream to RM 106 are not expected based on description of the river banks presented in the Corps' Channel Deepening EIS (USACE 1999).

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[63] Pearson, W.H., W.C. Fleece, K. Gabel, S. Jenniges, and J.R. Skalski. 2008. Spatial analysis of beach susceptibility for stranding of juvenile salmonids by ship wakes. Final report prepared for the Port of Vancouver, Vancouver, Washington by ENTRIX, Inc., Olympia, Washington, Project No. 4154501.

Based on the facts a conclusion of negligible impacts is warranted rather than a conclusion of moderate to major impacts. The DEIS also indicates that fish may be impacted due to noise from the vessel traffic associated with the Facility which may not be accurate.

The DEIS, page 3.6-51 states:

> *Pacific salmon, groundfish, and pelagic species EFHs occur within the vessel corridor from the Columbia River mouth to 3 miles at sea, at the start of the EEZ. Impacts to EFH within the vessel corridor associated with increased vessel traffic could be noise from vessels, leaks of fuels or lubricants from transiting vessels, or wake-induced habitat changes from an increase in deep-draft vessels using the Columbia River.*
>
> *Vessel traffic associated with Facility operation could adversely affect EFHs by temporarily increasing noise levels near transiting vessels and fish would likely move away from the source of noise (Mitson 1995). Fish are able to detect vessel noise over a large range of frequencies, tens to several hundred Hz (Mitson 1995). Avoidance reactions in fish occur at a distance of approximately 100 to 200 meters (328 to 656 feet) from the vessel, but could occur at distances up to 400 meters (1,312 feet) in louder vessels (Mitson 1995). Vessels currently travel up and down the Columbia River and noise impacts to EFH is currently ongoing. Noise from vessels is of short duration as the vessels pass through EFH. The added noise from the increase in vessel transits associated with the proposed Facility would result in a minor localized impact to Pacific salmon, groundfish, and pelagic species EFHs.*

The specific citation used for fish avoidance (Mitson 1995), referenced in both sections) is a technical report that addresses fish response to underwater noise associated with fisheries research vessels. It may not be appropriate to apply these observations to tanker traffic associated with the Facility. Similar to Popper et al. 2014 (see response regarding behavioral effects during vibratory pile driving above), Mitson notes that detection does not equate a response, and that for fisheries research vessels, "they [fish] are unlikely to react and move away unless the noise is relatively high, typically when the distance is a few hundred meters" (page 7). Again, it is important to consider that the noise signature and fish responses to of a research vessel are not predictive of vessel noise and responses to Facility tankers. See page 16 for an example of a response to a vessel traveling at 15 knots directly overhead of a hibernating herring school.

For EFH, the DEIS uses the Mitson (1995) distances of observed effects (100 to 200 meters, up to 400 meters for louder vessels to infer potential behavioral effects, specifically avoidance, with those ranges from vessels in transit. It is speculative and inappropriate to quantify potential effects in this way based on the available data.

For fish species generally, the DEIS uses the potential for avoidance due to vessels (from Mitson 1995) combined with a modeled distance to behavioral threshold (150 dBRMS - note that this is typically used for pile driving and may not be applicable to vessels) to describe 341-meter avoidance area around vessels in transit. As described above (see response regarding behavioral

effects during vibratory pile driving), it is speculative for the DEIS to make statements or conclusions inferring the complete avoidance by fish of the area of sound above 150 dBRMS.

Section 3.6.3.3, Vessel Transportation, page 3.6-52

The DEIS, page 3.6 – 52 states:

> *Localized reductions of existing vegetation, prey, and overall EFH function could occur from wakes during vessel transit. Wake effects would be the greatest as vessels pass through the Columbia River estuary and its associated habitats including tidal wetlands, shallow water, and tidal flats. Pacific salmon, groundfish, and pelagic species EFHs occur within this area. As described above for habitat, the increase in deep-draft vessel traffic and associated increase in vessel wakes could result in a moderate to major long-term change to theses EFHs.*

As indicated in prior comments on Section 3.1.3.3, wakes from deep draft vessels are not expected to transmit wave energy to the shorelines in the lower 33 miles of the river where high quality wetlands and tidal flats occur. There is no basis for concluding that moderate to major long-term changes from wake effects will occur to EFH or the species that use it. The FES should indicate that wake effects on EFH would be negligible.

Prior comments on Sections 3.1.3.3, page 3.1.24; 3.6.3.3, page 3.6-51; and 3.6.3.3., page 3.6-53 provide an explanation on why impacts associated with vessel wakes are not likely to result in adverse impacts to habitat in the lower Columbia River including the estuary. Based on the analysis provided, the DEIS should find that impacts associated with vessel wakes will result in only a minor impact to EFH, and are not likely to be measurably different from impacts associated with existing vessel traffic on the river.

Additionally, as discussed in the comments on Section 2.8.2.5, No Action Alternative, the impacts, if any, from Proposed Action vessels will not be appreciably different than the same impacts from existing and expected vessel traffic on the river. Thus, any impacts identified in this section are impacts from existing baseline condition.

Section 3.6.3.3, Vessel Transportation, page 3.6-52, paragraph 6

The section of the DEIS that addresses impacts to fish from entrainment in water intakes notes that entrainment can result from vessel engine cooling water, ballast water, and terminal utility water intakes. This inaccurately portrays the sources of potential fish entrainment. The DEIS should clarify that there is no potential for entrainment of fish associated with terminal utility water intake or ballast water intake.

The Facility, including its marine terminal component, would not have a surface water intake, and would therefore not cause entrainment of fish. Vessels serving the facility do have intakes for engine cooling water and for ballast water intake. However, it should also be clarified that vessels serving the facility would not likely be taking on ballast water within the vessel

corridor, nor at the facility. Vessels would enter the shipping corridor fully ballasted, and would shed ballast consistent with the EPA's 2013 National Pollutant Discharge Elimination System (NPDES) Vessel General Permit for Discharges Incidental to the Normal Operation of Vessels (VGP)[64]

Section 3.6.3.3, Vessel Transportation, page 3.6-53

The DEIS Section 3.6.6.6, page 3.6-53 contains a number of unsupported statements and conclusions pertaining to stranding of fish by wakes resulting from the vessels serving the terminal. These are:

> *A recent study of observations limited to deep-draft vessels (e.g., bulk carriers, oil tankers, car carriers and container ships) reported that oil tankers produced the greatest stranding effects (Pearson and Skalinski [sic] 2011).*
>
> *Given that wake stranding is more common in the presence of deep-draft vessels, the approximately 223 percent increase in deep-draft vessel traffic associated with the proposed Facility could result in a moderate to major long-term effect on nearshore fish including listed salmonids and eulachon species in the lower 33-mile portion (16 percent) of the Columbia River.*

The discussion and conclusion in the DEIS mischaracterize the cited literature by concluding that oil tankers produce the greatest stranding effects. Note that Pearson et al. 2006 is the study that contains the source data which is re-analyzed in Pearson and Skalski 2011. In their results, Pearson and Skalski (2011) state that, "oil tankers comprised the only vessel type for which stranding occurred in more than 50% of the vessel passages." The authors' statement is consistent with the source material (Pearson et al. 2006), which states "Oil tankers produced the highest proportion of stranding occurrences (7 of 10 observed passages resulted in stranding). This was the only vessel type for which stranding occurred in more than 50% of the vessel passages."

The result that oil tankers had the highest proportion of passages with observed strandings in limited a sample of ten observations does not support a conclusion that oil tankers produced the greatest effects. This metric of stranding occurrence provides no information as to the total numbers of fish that were stranded and of what species. The details of the source data (from appendices in Pearson et al. 2006) must be examined to see if there is any basis to draw a conclusion beyond the results stated above from Pearson et al. (2006).

The small sample size of oil tankers that were observed by Pearson et al. (2006), is a very limited basis for extrapolating any conclusions about differentiating effects by vessel type on fish populations. Of the 126 vessel passages documented in Pearson et al. (2006), only 10 (approximately 8 percent) were oil tankers. Bulk carriers (73) were most common, followed by

[64] Environmental Protection Agency (EPA). 2013. National Pollutant Discharge Elimination System (NPDES) Vessel General Permit for Discharges Incidental to the Normal Operation of Vessels (VGP)

car carriers (25) container ships (14), and other vessel types (4). For oil tankers, 7 of 10 passages resulted in stranding of any species of fish, 5 passages stranded juvenile salmon.

Next, there is the question of the number of fish stranded per passage. Pearson et. al. (2006) involved a total of 520 fish (of all species) observed stranded, including 441 juvenile salmon (consisting of 426 year 0+ Chinook salmon, 7 year 0+ Coho salmon, and 8 chum salmon) during the passage of 126 vessels of all types during the study. A total of 53 fish (all species) were observed stranded during the 10 oil tanker passages. Therefore, in terms of all species the oil tanker passages (8 percent of all vessels) stranded about 10 percent of all fish. In terms of juvenile salmon, the 10 oil tanker passages stranded 36 juvenile salmon out of the 411 total salmonids stranded. This means the oil tankers (8 percent of all vessels) stranded just less than 9 percent of the total juvenile salmon observed stranded in the study. These results indicate that stranding by oil tanker wakes was very close to being proportional to stranding by all other vessel passages observed. These results based on a small sample size do not support a conclusion of greater effects by oil tankers as compared to other vessels.

The DEIS statement that *oil tankers produced the greatest stranding effects* is inaccurate, and should be removed from the FEIS and any conclusions drawn from this statement should be revisited in light of this inaccuracy.

The stated *223 percent increase in deep draft vessel traffic* is based in part on an inaccurate assessment of 2014 VEAT data published by Ecology. See discussion for Section 3.6.1, page 3.6-2 bullet 6; and Section 3.6.3, page 3.6-51 paragraph 3 that addresses this issue. Any analysis and conclusions based on this information should be updated in the FEIS.

The conclusion about where stranding occurs on the river is incorrect, the conclusion of effects to nearshore fish communities in general is unsupported and the conclusion about the magnitude of the effects on fish (moderate to major) is incorrect and not supported by the cited literature.

The DEIS is incorrect to conclude that stranding occurs *in the lower 33-mile portion (16 percent) of the Columbia River*. The authors of the DEIS did not correctly interpret the results of Pearson et al. 2008[65]. Pearson et al. 2008 was a GIS-based analysis of the physical characteristics of the Columbia River shoreline intended to determine the portions of the river that presented a risk of stranding of fish when a vessel wake interacted with the shoreline. This study built on the results of Pearson et al. 2006, which identified shoreline characteristics that were associated with stranding risk. A key conclusion of Pearson et al. 2008 was: "The results of this study clearly indicate that physically-based susceptibility to stranding of juvenile salmonids by ship

[65] Pearson, W.H., W.C. Fleece, K. Gabel, S. Jenniges, and J.R. Skalski. 2008. Spatial analysis of beach susceptibility for stranding of juvenile salmonids by ship wakes. Final report prepared for the Port of Vancouver, Vancouver, Washington by ENTRIX, Inc., Olympia, Washington, Project No. 4154501.

wakes is limited to a portion of the LCR [lower Columbia River] - approximately 16% (~33 miles) of the LCR shorelines with beaches close to the channel, not shielded from wave action, and with beach slopes less [than] 10%."

The 33-miles of shoreline referenced by Pearson et al. (2008) is the sum of the area of numerous non-connected beaches that the authors concluded exhibited physical characteristics predicted to have an above-minimal risk of stranding (Figure 1). Pearson el al. (2008) does not conclude that stranding is limited to the "lower 33-mile portion of the Columbia River" instead it concludes that there is a total of 33 miles of non-contiguous beaches with above minimal risk of stranding within the area they defined as the "Lower Columbia River".

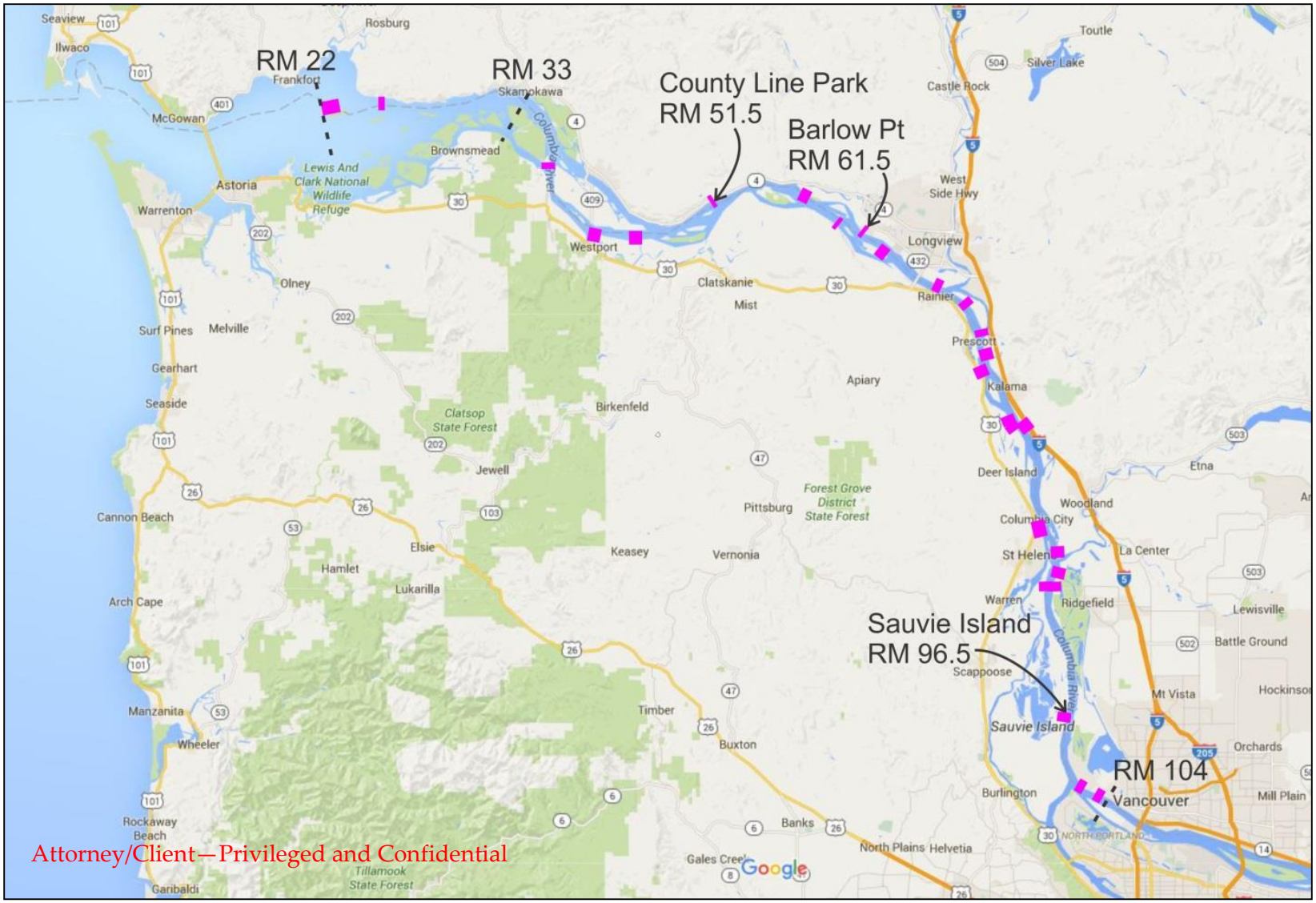

Figure 1. Areas within the lower Columbia River identified by Pearson et al. (2008) as having an above-minimal susceptibility to wake stranding risk (pink segments, totaling approximately 33 miles of shoreline) (Graphic © Google 2015)

Pearson et al. (2008) defined the "Lower Columbia River" on page 29 of their report to begin at the mouth [RM 0] and extend to Vancouver, Washington [RM 104], which corresponded to the upstream and downstream extents of their study area and encompasses essentially the entire "Vessel Corridor" for the DEIS. Figure 1 shows the location of the areas identified by Pearson et al. (2008) that have characteristics concluded to have an above-minimal risk of stranding. These area occur from RM 22 to RM 104 and there is no contiguous (emphasis added) 33-mile reach of the "lower river" where the shoreline characteristics indicate a susceptibility to stranding.

The errors in the DEIS as to the area of stranding risk are clearly demonstrated by the absence of locations with stranding risk between RM 0 and 22 (Figure 1). Pearson et al. (2008) found that shorelines downstream of RM 22 were too far distant from the navigation channel for vessel wakes to pose a stranding risk. Further, only two areas were identified with an above-minimal risk of stranding between RM 22 and RM 33 (Figure 1). Therefore, the lower 33 miles of Columbia River, contrary to the DEIS discussion, is an area of very low potential for fish stranding from vessel wakes rather than an area of high stranding.

The DEIS's conclusions about the magnitude the effects of stranding on fish, including ESA-listed salmon and eulachon (moderate to major effects), cannot be supported by the existing studies. Recent work (Grette Associate 2016[66], included as Appendix A; Coast and Harbor Engineering 2016[67], included as Appendix B) provide additional analysis pertinent to vessel wakes and fish stranding within the Vessel Corridor area.

As demonstrated above the DEIS erroneously concluded that stranding occurred in the *lower 33-mile portion of the Columbia River*. Pearson et al.'s (2008) 33 mile total of beaches along the shoreline of the "Lower Columbia River" includes beaches on both the Washington and Oregon sides of the river. Therefore, for the purposes of Pearson et al. (2008), the 104 river miles from RM 0 to RM 104 contains 208 miles of shoreline. The DEIS conclusion of moderate to high stranding risk was based on an assumptions that 66 miles of shoreline (33 miles on each side of the lower 33 miles of the river) were subject to stranding. So in addition to identifying the wrong location in the river, the DEIS considered too much shoreline length as having the potential to strand fish.

In addition to identifying the 33 miles of shoreline that had an above minimal risk of stranding, Pearson et al. (2008) further refined their criteria to identify the subset of shoreline that had the highest risk of stranding as defined by their parameters (See Appendix A, Section 4). Of the 33 miles of shoreline reaches with above-minimal risk of stranding, only about 8 miles (about 4 percent of the 208-mile study area) was predicted to have the highest stranding risk as defined by Pearson et al. (2008). All the beaches in this 8 mile total are located upstream of RM 33. These results indicate that stranding risk is relatively high only in a very small portion of the

[66] Grette Associates 2016. Wake Stranding in the Lower Columbia River (Attachment 3-1)
[67] Coast and Harbor Engineering. 2016. Technical Report: Lower Columbia River Morphology and Fish Stranding. Prepared for Grette Associates, LLC.(Attachment 3-2)

208 miles of shoreline in the Vessel Corridor and all these beaches are upstream of the lower 33 miles of the Columbia River.

During the Pearson et al. (2006) study, a total of 126 ship passages were observed at the three study sites (County Line Park, Barlow Point, and Sauvie Island), and 46 passages resulted in the stranding of 520 fish of all species. The majority (426 fish, 82 percent) of stranded fish were small subyearling (age-0+) Chinook salmon. A total of eight juvenile chum salmon and seven juvenile coho salmon were stranded, for a combined total of 441 juvenile salmon (85 percent of all fish).

Non-salmon comprised 15 percent of the observed stranded fish. These were dominated by three-spine stickleback (40 fish, 8 percent). The remaining species were each represented by fewer than 10 strandings (less than 2 percent of the total), listed in decreasing rank: peamouth chub (9), mountain whitefish (8), banded killifish (7), bass (fry) (5), American shad (4), yellow perch (2), sunfish/bluegill (1), crappie (1), starry flounder (1), and unidentified salmonid (1).

Although yearling (age-1+) Chinook salmon, juvenile steelhead, and sculpin were detected in beach seines nets at the study sites in very low numbers, they were not observed in stranding events.

Overall, subyearling (age-0+) Chinook salmon are the species that are most often stranded by vessel wakes. That species and life stage was also the most common fish captured in beach seine nets at the study sites, indicating they were highly available to be stranded. The next most stranded species three-spine stickleback, was stranded about one tenth as often as were subyearling Chinook salmon.

Based on these results no generalized conclusions about moderate to major long-term effects to nearshore fish can be supported by the data. The balance of the comment is focused on the effects to subyearling Chinook salmon and eulachon.

As demonstrated above wake stranding does not pose a risk to all juvenile salmonids but rather only to small subyearling Chinook salmon. Extensive studies at specific locations on the Columbia River where wake stranding occurs have shown that ship wakes primarily result in stranding when small subyearling Chinook are present in the shallow water margin near the shore, and the majority of shorelines where wake stranding may occur are within the tidal freshwater region (Bauersfeld 1977, Ackerman 2002, Pearson et al. 2006, Pearson et al. 2008). This area is roughly defined as occurring from RM 34 to RM 104. The majority (425 of the fish stranded or 82 percent of the total) of stranded fish observed by Pearson et al. (2006) were small (~35 to 80 mm) subyearling (age-0+).

Small subyearling Chinook salmon use shallow water areas close to shore while outmigrating through the lower Columbia River (McCabe et al. 1986, Dawley et al. 1986, Healy 1991, Bottom et al. 2005, Bottom et al. 2008). Collectively, subyearlings from multiple Evolutionary Significant Units (ESUs) of Chinook salmon may be present in the lower Columbia year round in varying numbers. Based on genetic-stock analyses from subyearling chinook salmon

captured in shallow nearshore habitat (Appendix A, Section 3.1.2) and seasonal expectations for presence in the habitat zones (Appendix A, Section 3.1.3), exposure to stranding risk is expected to primarily concern small subyearlings from the fall-run stocks of the Lower Columbia River ESU during the winter, spring, and early summer. In addition, minor proportions of the Upper Willamette River ESU may be exposed to stranding risk during the winter and spring (particularly upstream of RM 74). The Upper Columbia summer/fall-run ESU (not ESA-listed) also could be exposed to limited stranding risk upstream of RM 74 during the spring and early summer. All other ESUs are expected to be at very low risk of stranding due to their near absence from the shallow water shoreline during seasons where stranding occurs (Appendix A, Sections 3.1.2 and 3.1.3).

Overall, subyearlings of the lower Columbia River Chinook ESU are expected to be the salmonids at greatest risk of stranding in the Vessel Corridor for the Vancouver Energy Project.

Eulachon

Overall, eulachon are not expected to be at high risk of being stranded by vessel wakes in the Vessel Corridor. Neither juvenile nor adult eulachon stranding has been addressed in the studies referenced above, however, the results of the wake stranding studies for salmonids provide a means to predict, on a macro level, the potential for this species to be at risk of wake stranding.

Pearson et al. (2006) was the most intensive field study examining wake stranding. An important element of the study was the use of sampling of nearshore habitat with a beach seine net to determine the fish community residing in the shoreline habitats in the vicinity of wake stranding study areas. The expectation was that those species residing in shallow should be at greatest risk of stranding. During the study, over 17,096 fish of approximately 23 species were captured. Of these totals, 49 percent of the total catch was subyearling Chinook salmon while 82 percent of the fish stranded were subyearling Chinook salmon. These fish actively select shallow water habitat to occupy during their rearing migration. This behavior and habitat preference put them at greater risk of stranding than other species in the Columbia River. No eulachon were observed either stranded or in beach seine sets conducted by Pearson et al. (2006).

Based on the results for subyearling Chinook salmon, adult eulachon would only be exposed to stranding risk while present in shallow margin habitats of the Columbia River. Adults preferentially spawn in coarse, clean sand or gravel (Cowlitz Indian Tribe 2012). As reviewed in Willson et al. (2006), spawning can occur at various depths, and has been documented at up to 20 feet in the Columbia River (Smith and Saalfield in Willson et al. 2006) and 25 feet in the Fraser River in British Columbia (Hart and McHugh in Willson et al. 2006). The eggs adhere to these substrates which weigh them down and make them susceptible to bedload transport away from spawning areas. Sampling within sand waves of the lower Cowlitz, Kalama, and Grays rivers revealed viable eggs and larvae beneath as much as 24 inches of substrate (Cowlitz Indian Tribe 2012). This reveals that even though the majority of spawning takes place within

the upper tributaries, egg incubation and larval emergence could also occur in the lower portions of tributaries and, to some extent, the Columbia River mainstem. Although the relative importance of the Columbia River mainstem for spawning is not clear, areas of sand-wave bed forms may support egg incubation.

Assuming that some portion of adult eulachon spawn in the Columbia River mainstem, they are not likely to so in the shallow margin where fish are susceptible to stranding because this area is not typically characterized by moderate to fast moving water over coarse substrates. Therefore, one can infer a very low susceptibility to stranding risk. Further, adult eulachon are strong swimmers; any adult eulachon which may occur in the shallow margin (spawning or in transit) are unlikely to be entrained by onshore waves. Overall, based on their distribution and swimming ability adult eulachon do not appear to be at risk of wake stranding in the lower Columbia River.

Fertilized eulachon eggs settle out of the water column in areas where active currents occur, rather than in slow-moving peripheral waters. Dynamic areas of the Columbia River mainstem are considered especially well-suited for the incubation of eulachon eggs because active currents maintain elevated dissolved oxygen levels and limit the stability of benthic habitat to potential predators. The suitability of habitat in the river mainstem for incubation is supported by larval sampling surveys which have detected the majority of emergent eulachon larvae in deep- to mid-water portions of the Columbia River. Therefore, the majority of eulachon eggs are expected to occur in areas of the river mainstem where they are unlikely to be exposed to wake stranding risk.

Larval eulachon are poor swimmers that are transported downstream by the current. The majority of eulachon larvae are expected to emerge from dynamic areas of the Columbia River and be rapidly dispersed downstream within mid- to deep-water portions of the water column; it is unlikely that eulachon larvae would occur in high numbers in shallow nearshore habitats. Based on their lack of a focused preference and movement towards shallow water margin habitat, eulachon larvae are not expected to be highly susceptible to wake stranding.

As stated above the results of Pearson et al. (2008) demonstrate there is little standing risk in the lower 33-mile portion of the Columbia River. However, Pearson et al. (2008) did identify that a total 33 miles of beaches (dis-contiguous shoreline), was predicted to have at least some potential to strand fish when vessel wakes interacted with the shoreline in the portion of the river between RM 22 and RM 104. The conclusion that these beaches have a risk of stranding is very conservative (i.e., more likely to predict stranding occurs when it does not occur than vice versa) due to the inclusion of the criterion that a ten percent slope could strand fish (see Appendix A section 4). Pearson et al. (2008) presents information from previous studies (presented as Figure 9 in appendix A) showing that fish are more typically stranded on beaches with slopes flatter than about 5 or 6 percent and not all of the very flat beaches strand fish. Therefore, we conclude that the 33 miles of shorelines identified above includes many beaches that have very limited to no stranding risk due to the inclusion of the very conservative 10 percent criterion.

When Pearson et al. (2008) included in their criteria the presence of underwater berms (a ridge or complex beach feature that affects how the waves interact with the beach) and only considered beaches with very flat slopes (<2.5 percent), 4 percent of the total beach area had the highest predicted potential susceptibility to stranding. Four percent of the approximately 208 miles of shoreline study means that approximately 8 miles of shoreline were predicted to have a high susceptibility to stranding based on including the two additional criteria.

(Pearson et al. 2006) noted that much of the stranding at Barlow Point occurred in an area where strong cross-waves and an eddy formed when the waves ran up the beach. Other researchers (Hinton and Emmett 1994 and Baursfeld 1977 noted the importance of fine-scale beach features (e.g., coves, inlets, and shoreline depressions) in redirecting wave energy to congregate, transport, and trap fish. Collectively these observations suggest that the approximately 8 miles of beaches identified as having high susceptibility to stranding as identified by Pearson et al. (2008) likely need to have such fine-scale features for the predicted high occurrence of stranding to actually occur. Pearson et al. (2008) used video available from other researchers to examine what fine-scale features (specifically looking for rip-rap, gabions, piers etc.) were present near their study beaches. They did not draw conclusions about what was seen or use the observations to develop another criteria to further refine their predictions of stranding susceptibility for the transects studied.

It is important to consider fine-scale beach morphology because based on the results of the stranding studies (particularly at Barlow Point) it is known that even at a site that has characteristics that based on Pearson et al. (2008) suggest a high susceptibility to stranding over much of the site, actual standing only occurs in a subset of the site in "hotspots". Stranding at hotspots is best illustrated at Barlow Point (see Appendix A, Figure 10). In contrast to the wider distribution of stranding events at County Line Park (Appendix A, Figure 11) and Sauvie Island (Appendix A Figure 12), the majority of stranding events at Barlow Point were clustered at a very small upstream hot spot. The magnitude of stranding at Barlow Point suggests that something more complex and unique is happening there than at either the Sauvie Island or County Line Park study sites.

The DEIS's makes the following broad conclusions about stranding:

> *... moderate to major long-term effect on nearshore fish including listed salmonids and eulachon species in the lower 33-mile portion (16 percent) of the Columbia River.*

DEIS's broad conclusions about stranding are flawed because:

- The DEIS identifies the wrong area of the lower Columbia River as having beaches that are likely to strand fish. Stranding does not occur in the "lower 33 miles of the Columbia River". There is no *contiguous* (emphasis added) 33-mile reach of the "lower river" where the shoreline characteristics indicate a susceptibility to stranding (Figure 1).

- Stranding primarily affects one species (Chinook salmon) not the broader categories of "nearshore fish" or "salmon".

- Eulachon appear to be at limited risk of stranding by vessel wakes based on the analysis provide above, and were not detected in the most intensive stranding study that has been conducted (Pearson et al. (2006).

- Further with respect to stranding of Chinook salmon, only small (35mm to 80mm) fish of one age group (0+ subyearlings) is at risk of stranding and only when present in shallow water.

- The subyearling Chinook salmon that are produced above Bonneville Dam are typically larger than 80 mm when they reach the Vessel Corridor and are not expected to be close to shore and susceptible to risk of the stranding.

- Subyearling Chinook from the Upper Willamette River ESU could be of a size that they are subject to stranding when they exit the Willamette River and reach the Vessel Corridor. However, they are distributed close to shore only in the upper portions of the Vessel Corridor and in much lower numbers than the Lower Columbia River ESU.

- The subyearling Chinook salmon that are subject to stranding are primarily from one ESU, (Lower Columbia River). Subyearling Chinook salmon from the Upper Willamette River ESU are at a lower risk of standing because they are present close to shore in much lower numbers and along a much shorter portion of the Vessel Corridor.

Stranding by vessel wakes is not a risk to the general fish community, it is a risk for two discrete components of the fish community. However, Chinook salmon area highly valued in the Pacific Northwest and the ESU's described above are listed as "threatened" under the Endangered Species Act.

Existing ship traffic in the Vessel Corridor yields some wakes that cause mortality of small subyearling Chinook salmon (Pearson et al. 2006). Vessel traffic in the Columbia River is less than it was at its peak in the recent past. Ship calls to the proposed facility or increases in calls to existing facilities could contribute to additional mortality compared to that occurring at todays reduced level of vessel traffic. Ship calls to the Columbia River could increase or decrease without the Project up to or beyond the historical peak. This means the impacts of the no-action alternative could be less than, equal to, or greater than the impacts from Facility related vessels due to economic factors that drive ship calls to the Columbia River. For this reason, the impact of wake stranding is most accurately addressed from the perspective of cumulative impacts (see Section 5.7 Cumulative Impacts).

Section 3.6.4, No Action Alternative, Page 3.6-56

This impact analysis and recommendation does not adequately consider the no-action alterative or complete the analysis necessary to directly attribute any purported impact to this project, as distinguished from baseline conditions and non-project impacts. As indicated in Section 2.6 and 3.14.2.2, the vessel traffic on the Columbia River well-established and has been occurred over long periods of time. Existing vessel traffic currently creates these impacts and other increases

in non-project traffic will also continue to create them. According to the analysis in the DEIS, any purported increase in vessel traffic is minor attributable to the Project is minor. The analysis and recommendation do not acknowledge that any purported impacts occur from existing vessel traffic and will increase from non-project related increases in vessel traffic. Accordingly the vessel traffic associated with this project does not create an impact distinguishable from the no-action alternative such that any purported impacts are not attributable to this project.

Section 3.6.5, Mitigation Measures, page 3.6-57, bullets 1-3

Comments regarding the mitigation measures regarding construction stormwater and groundwater monitoring are discussed in Sections 3.3.5 above. Comments regarding the modified work window mitigation measure are discussed Section 3.6.3.1 above.

Section 3.6.5, Mitigation Measures, page 3.6-57, bullet 4

The DEIS proposes the following mitigation measure in Section 3.6.5, page 3.6-57 bullet 4:

> *Modify the walkways and trusses for the proposed dock modifications to use steel grating designed to let at least 60 percent of sunlight penetrate into areas over shallow-water habitat and use retractable shore-based walkways that would be in place only during periods when vessels are moored.*

The proposed dock modifications as described in the DEIS propose to replace existing trusses and grated walkways with replacement trusses and grated walkways, and to use retractable/movable, shore-based, grated walkways for access from shore to the two existing mooring dolphins. This is an example of where the DEIS doesn't properly recognize the mitigation measures that have been incorporated into the project design.

As stated in the mitigation measure above, the trusses cannot be grated and are solid beams designed to assure structural capability. The trusses, by their nature, are constructed with an open construction methodology to allow light penetration and minimize the shading impacts that would occur if the replacement structures were solid. In addition, the trusses and walkways are located in deep water habitat with no aquatic vegetation, minimizing impacts resulting from the overwater coverage.

The DEIS should be corrected to remove the proposed mitigation measure as stated. The impact assessment (in Section 3.6.3) should be corrected to clarify the proposed dock modifications and how they would minimize potential impacts associated with new overwater coverage by replacing existing trusses and grated walkways with replacement trusses and grated walkways, and by using retractable/movable, shore-based, grated walkways for access from shore to the two existing mooring dolphins.

Section 3.6.5, Mitigation Measures, page 3.6-57, bullet 5

The DEIS proposes the following mitigation measure in Section 3.6.5, page 3.6-57, bullet 5 related to wake stranding:

> *Develop mitigation for wake stranding and wake effect impacts in consultation with appropriate state and/or federal agencies. Examples might include the addition of fine-scale beach features such as strategically placed logs or vegetation in susceptible areas to provide refuge from wakes for habitat types important to juvenile fish".*

The FEIS should modify the proposed mitigation to reflect that the minor impacts from wake effects do not warrant the mitigation measures proposed. As discussed in comments on Section 3.6.3.3, the impact analysis and recommendation does not adequately consider the no-action alterative or complete the analysis necessary to directly attribute any purported impact to this project, as distinguished from baseline conditions and non-project impacts. According to the analysis in the DEIS, any purported increase in vessel traffic is minor attributable to the Project is minor. The analysis and recommendation do not acknowledge that any purported impacts occur from existing vessel traffic and will increase from non-project related increases in vessel traffic. Accordingly the vessel traffic associated with this project does not create an impact distinguishable from the no-action alternative such that any purported impacts are not attributable to this project.

Section 3.6.5, Mitigation Measures, page 3.6-57, bullet 6

The DEIS proposes the following mitigation measure in Section 3.6.5, page 3.6-57 bullet 6:

> *Reduce vessel transit speeds in areas that are more susceptible to wake stranding of juvenile fish due to shoreline geomorphology…*

The proposed mitigation measure is infeasible because the Applicant is not in control of vessel transit speeds. The US Coast Guard has published Inland Navigation Rules that dictate vessel movement on the Columbia River (USCG 2014).[68] While these regulations do not dictate specific speed limits, they require vessel pilots to "proceed at a safe speed so that she can take proper and effective action to avoid collision and be stopped within a distance appropriate to the prevailing circumstances and conditions." The inland navigation rules identify some factors to be taken into account when determining what a safe speed is, which include: 1) visibility; 2) density of vessel traffic; 3) maneuverability of the vessel (stopping distance and turning ability in the prevailing conditions); 4) lighting conditions 5) wind, sea, and current conditions; 6) the proximity of navigational hazards; and 7) the draft of the vessel in relation to water depth. Additional considerations are indicated for vessels with operational radar (USCG 2014).

[68] US Coast Guard (USCG). 2014. Navigation Rules and Regulations Handbook. August 2014 edition.

Pilots operating vessels on the Columbia River must operate their vessels consistent with these regulations and safety considerations, and as such it would be infeasible for the Applicant to attempt to impose speed restrictions on pilots of project vessels.

In addition to the reasons identified in response to the prior proposed mitigation measure, the DEIS should modify the proposed mitigation to reflect that the minor impacts from wake effects do not warrant the mitigation measures proposed.

Section 3.6.5, Mitigation Measures, page 3.6-57, bullet 8

The DEIS proposes the following mitigation measure in Section 3.6.5, page 3.6-57 bullet 8:

> *Revise the MMMP to include two additional observers to assist in monitoring the 6-mile zone where marine mammals could be affected by in-water vibratory pile driving.*

While the DEIS does not contain any explanation as to why the MMMP proposed by the Applicant would be inadequate, the Applicant is willing to agree to the request for 2 additional observers.

Section 3.6.6, Significant Unavoidable Adverse Impacts, pages 3.6-57 and 58

The following Significant Unavoidable Adverse Impacts should be removed from this section:

> *Overall, noise impacts to aquatic species (fish and pinnipeds) from noise generated by pile driving would be temporary but moderate.*

Based on the comments on Section 3.6.3 noted there would be no probable significant adverse impacts to aquatic species from noise generated by pile driving. As such, this statement regarding significant unavoidable adverse impact should be removed from the EIS.

Additionally, for the reasons discussed above, the other statements regarding significant unavoidable adverse impacts from vessel traffic are not correct, and are indistinguishable from vessel traffic on the river generally under the No Action Alternative. These statements also should be removed from the DEIS

Section 3.7 Energy and Natural Resources

Sections 3.7.2.1 and 3.7.5, Proposed Facility and Mitigation Measures, page 3.7-3, paragraph 3 and page 3.7-8, bullet 1 under 3.7.5

The DEIS identified a natural gas supply deficiency that is incorrect because NW Natural and the Applicant have already identified how to address any limitation on service delivery to the site. This is an example of where DEIS failed to recognize and include mitigation measures proposed by the Applicant.

The affected environment discussion notes the following:

> *In the vicinity of the proposed Facility, NW Natural has identified an immediate resource deficiency in both the supply and the distribution system in the Vancouver load center. To remedy this deficiency, distribution system upgrades are needed in Vancouver/Clark County as soon as is feasible (NW Natural 2013). NW Natural has launched several projects to strengthen the distribution system capacity in Clark County over the next few years to serve the load forecasted in their 2014 Integrated Resource Plan (Lange, pers. comm., 2015).*[69]

and,

> *The design features and BMPs the Applicant proposes to avoid or minimize environmental impacts during construction, operations and maintenance, and decommissioning are assumed to be part of the Proposed Action and have been taken into account during the analysis of environmental impacts to energy and natural resources in this Draft EIS. EFSEC has identified the following additional mitigation measure to reduce impacts to energy and natural resources: Coordinate with NW Natural to perform a site-specific evaluation to determine the actual physical and financial aspects required for NW Natural to serve the proposed Facility.*[70]

The DEIS statement noting a resource deficiency in both the supply and the distribution system in the Vancouver load center is in error and not supported by the referenced 2013 Integrated Resource Plan (NW Natural 2013). The Plan only included information about distribution in the Felida neighborhood, and the issue is already being resolved[71].

Whereas the 2013 Integrated Resource Plan does discuss improvements needed to insure greater reliability in the Vancouver area, there is no identified deficiency in either supply or distribution network. Furthermore, Coordination with NW Natural has occurred and they are prepared to provide the necessary service line[72]. There will be no limitation on natural gas supplies through the anticipated needs of the Facility.

The FEIS should correct the information in Section 3.7.2.1 to state that prior coordination has occurred with NW Natural, and remove the mitigation in Section 3.7.5.

Section 3.7.4, No Action Alternative, page 3.7-7 and 8

This section lacks a discussion of the continued need to supply refineries on the west coast and that without the Facility, crude oil will be supplied by other existing transportation routes.

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[69] DEIS Page 3.7-3

[70] DEIS Page 3.7-8

[71] NW Natural 2013, Page 7.10: While this "Felida Gate" project is expected to cost far less than $10 million in all, this project is a key component of the Company's plans to address existing low distribution system pressures in the area during cold weather conditions and to meet future load growth in the Clark County load center.

[72] Savage Services, Meeting Minutes with NW Natural, May 19, 2014.

Additionally, if the crude oil supply to the West Coast refineries were not to continue shortages of crude oil and refined petroleum projects could occur. The FEIS should correct this error by including a discussion in this section.

Section 3.8: Environmental Health

Section 3.8.2, Affected Environment, page 3.8-4 and Table 3.8-1

The DEIS does not list/specify the institutional controls in place for each affected area at the proposed facility. All site development must comply with the limitations.

The institutional controls are specific to each contaminated area. Those relevant to the Facility construction and operation include:

Restricted Covenant/ Covered Area	Institutional Controls in Place
Vanexco/Rod Mill Site	Activity that may interfere with the cleanup action is prohibited; any activity that may result in the release of hazardous substances that were contained as part of the cleanup is prohibited. Approval must be obtained from Ecology prior to any use of the site that is inconsistent with the terms of the covenant.
Spent pot liner storage area, North Cap and North Cap 2, East Landfill, Shoreline	The site may only be used for industrial purposes (per RCW 70.105D.020 [14]) and allowed under City of Vancouver zoning regulations (VMC Title 20). Approval must be obtained from Ecology for any activity that may result in release or exposure to the environment of the contaminated soil within the restricted areas (noted above), create new exposure pathway, or for uses that may be inconsistent with the covenant, is required. The use of groundwater for consumption or other beneficial purposes is prohibited; however, construction dewatering is permitted. A waste determination is required for any water that is extracted during dewatering activities and water must be handled, stored, and managed according to applicable laws and regulations. Wells or groundwater extraction is specifically prohibited in the vicinity of the East Landfill. Activity on the property that may interfere with the integrity of the remedial action and the continued protection of human health and the environment is prohibited.

The FEIS should include the institutional controls (restrictive covenant conditions) specific to each contaminated area at the proposed facility (outlined above) to Section 3.8.2.1 to demonstrate how Facility design and existing regulatory measures will address this impact.

Section 3.8.2.2, Rail Corridor, page 3.8-7

The DEIS makes several statements about safety along the rail corridor that appear to be incorrect, unsupported, or missing key information. Because this analysis is based on incorrect information or assumptions, the underlying conclusions are also in error. EFSEC should consult with BNSF directly about this topic. Further, at page 3.8-7, the FEIS should specify the 2500 ADT threshold used for further crossing assessment described in this section, as that diagnostic review does not apply to every at-grade crossing along the rail corridor.

Section 3.8.3.1, Proposed Action, page 3.8-8 paragraph 1

The DEIS addresses the Applicant's Construction Emergency Response Plan, indicating that the plan was developed in coordination with local emergency responders and that the Applicant has begun consultation with local responders.

Upon submittal of this plan to EFSEC, the Applicant indicated in relationship to the Operations Emergency Response Plan that "…under typical project development practices local emergency responders provide input to the project proponent on procedures addressed in such plans. The Applicant has attempted to conduct such coordination with the City of Vancouver; however, the City has declined to participate in discussions relative to the content of this plan. In the absence of such coordination with local emergency responders, the Applicant has prepared this plan to the best of its professional knowledge of industry practices and requirements relative to emergency response."[73] This statement also applies to the Construction Emergency Response Plan, as well as to the statement regarding the identification of gaps in existing firefighting equipment.

The FEIS should corrected as noted above regarding the Applicant's coordination with local emergency responders as follows:

> ***Occupational/Worker Safety***
> *Occupational safety risks to proposed Facility construction workers would be managed through the implementation of safety and emergency plans. The Applicant's Health, Safety, Security, and Environmental (HSSE) Plan (included in Appendix D.11) outlines procedures to address site hazards including traffic hazards, proximal active rail lines, confined space entry, elevated work platforms, tool and equipment use, soil disposal, and hazardous materials handling. The Applicant has drafted a Construction Safety Plan that would apply to all personnel working at*

[73] Makarow, Irina. 2015. Letter to Stephen Posner, Energy Facility Site Evaluation Council. Vancouver Energy – EFSEC Application No. 2013-01, Docket No. EF131590, Construction and Operation Plans. April 30, 2015.

the proposed Facility. The Construction Safety Plan has been submitted to EFSEC for review to ensure compliance with all applicable laws, ordinances, regulations, and standards concerning health and safety. This plan includes a Job Hazard Analysis that identifies hazardous tasks or work activities that can expose employees to the risk of injury. Tasks and activities identified in the analysis would be addressed with special planning and training prior to construction of the proposed Facility. During construction, the safety manager would have the authority to issue stop work orders when employees violate health and safety procedures. Upon identification of a health and safety issue, the safety manager would work with the responsible site managers and employees to correct the issue. Workplace hazards would be controlled with lockout/tagout procedures, safe work practices, and the appropriate use of personal protective equipment (PPE), in accordance with applicable WISHA requirements. Construction site access would be limited only to authorized construction personnel; other Port tenant employees and the public would not have access to construction activities to prevent exposure to site-related occupational hazards. The Applicant has also developed a Construction Emergency Response Plan (Appendix D.13) to ensure employee safety from fire and other emergencies. ~~This plan was developed in coordination with local emergency responders.~~ The plan considers and prepares for unintended construction-site incidents that could spread beyond the construction-site boundary. Finalization of this plan would occur prior to construction of the proposed Facility. Employee training and the implementation of construction manuals and safety plans and procedures would reduce risks to proposed Facility construction workers, resulting in minor impacts to occupational health and safety during construction of the proposed Facility.

Section 3.8.3.1, Proposed Action, page 3.8-11, paragraph 2

Section 3.8.3.1of the DEIS states:

> *Although the Applicant has proposed numerous BMPs and safety measures to prevent accidents, a boiler or steam pipeline explosion at the boiler building (Area 600), at the storage area (Area 300), or in the unloading and office area (Area 200) where railcars are heated could occur.*

Steam is neither being supplied nor used in the storage area (Area 300). The two *heated* storage tanks will be electrically heated. In addition, the analysis concludes that a moderate to major impact would occur to workers dependent on the nature and extent of the explosion and the presence of workers. The analysis does not support either the nature or frequency of explosions related to steam and boiler use.

The reference to steam use in the storage area should be removed. In addition, the impact assessment needs to consider the likelihood of a steam or boiler incident. Without evidence that a steam or boiler explosion would be probable, meaning likely or reasonably likely to occur under SEPA, the impact should not be classified as moderate to major. Additional comments are included in Chapter 4 regarding risk of an incident at the Facility.

Section 3.8.3.1, Proposed Action, pages 3.8.-12 and 13

The DEIS contains the following discussion of the spill containment areas on the dock, which is inconsistent with the proposal from the Applicant:

> *Secondary containment consisting of a fixed collection basin and curbing surround the loading arm handling area, connections, and dock manifold to collect drainage drips and washdown. The material collected in the basin would drain to a 30-bbl sump tank located under the dock, equipped with a 100-gpm pump that operates automatically. The sump would also be equipped with an 80-gpm pump that could be started manually in the event that additional pumping capacity is needed.*

EFSEC should revise this section to be consistent with the description contained in Chapter 2 page 2-50:

> *A catchment area at or below the deck level in the marine terminal would have a 3 bbl holding capacity. The contents of the containment would be discharged within 1 hour of completion of any transfer by pumping into either the return pipeline or a tank truck for disposal.*

Section 3.8.3.2, Rail Transportation, page 3.8-15

Impacts from accidents involving railroad employees or members of the public along the rail corridor currently occur, but the rail traffic generated by the proposed Facility would represent a small fraction of the overall number of trains using the entire rail system. The DEIS concludes that impacts to environmental health from rail transportation are expected to be minor for most crossings but may be moderate for crossings with existing elevated safety risks. These DEIS statement about safety along the rail corridor appear to be incorrect, unsupported, or missing key information. EFSEC should consult with BNSF directly about this topic.

For example, BNSF is a member of Operation Lifesaver, an industry-wide effort to eliminate accidents and collision between trains, vehicles, and people. The organization started in 1972 when the average number of collisions at U.S. highway-rail grade crossings had risen above 12,000 incidents annually. To address this, the Idaho governor's office, along with the Idaho Peace Officers and Union Pacific Railroad launched a six-week public awareness educational campaign called Operation Lifesaver to promote highway-rail grade crossing safety. After Idaho's crossing-related fatalities fell that year by 43 percent, the successful program was adopted by Nebraska (1973) and Kansas and Georgia the following year. Within a decade it had spread around the country; in 1986 a non-profit national Operation Lifesaver office was created to help support the efforts of state safety programs and raise national awareness on highway-rail grade crossing issues. The program promotes the three E's - education, enforcement, and engineering – to keep people safe around the tracks and railway crossings within our communities.

Operation Lifesaver programs provide valuable facts about trains, illustrate how drivers can safely navigate highway-rail grade crossings, and reinforce that it's illegal and unsafe to ever walk on, or use railroad tracks for, recreation.

This impact analysis does not adequately consider the no-action alterative or complete the analysis necessary to directly attribute any purported impact to this project, as distinguished from baseline conditions and non-project impacts. As indicated in Sections 2.6 and 3.14.2.2, the rail corridors are well-established and have been in use for long periods of time. The analysis and recommendation do not acknowledge that existing rail traffic will continue and non-project related increases in rail traffic will occur consistent with state projections. Accordingly, rail traffic associated with this facility should not be considered "additional" rail traffic because the railroad is a "common carrier" and maximizes the capacity of its rail lines to serve a variety of customers such that growth in rail traffic would occur under the no-action alternative. The trains associated with this Facility are part of a natural fluctuation in rail traffic. The rail traffic associated with this project does not represent an increase in traffic from the No Action Alternative and any purported impacts are not attributable to this project.

Section 3.8.3.3, Vessel Transportation, page 3.8-16

The discussion of risk of vessel collisions and accidents is not based on a complete and thorough risk assessment. A meaningful statistical analysis of potential vessel incidents is possible and should be the basis for reaching conclusions regarding whether an impact is significant under SEPA. A risk-based approach would provide a scientifically-based picture of vessel incidents. Scientific models are built to describe the likelihood and the consequences of vessel incidents. To refine the qualitative marine vessel transport risk assessments that the Applicant provided in the PDEIS, the Applicant retained DNV GL to conduct a more thorough quantitative assessment of marine vessel transportation risks (Attachment 4-4). The Applicant also retained Barkan, Saat and Ramos to complete a risk-based analysis of rail traffic (Attachment 4-2). Copies of those assessments are attached to this DEIS comment letter and are referred to in more detail later in our comments to Chapter 4. These reports should be incorporated in to the FEIS for a more complete assessment of the risk of collision.

Section 3.8.4, No Action Alternative, page 3.8-16

This impact analysis and recommendation does not adequately consider the No Action Alternative or complete the analysis necessary to directly attribute any purported impact to this project, as distinguished from baseline conditions and non-project impacts. As indicated in Sections 2.6, 2.7, 3.14.2.2 and 3.14.2.3, rail and vessel traffic is well-established and has been occurred over long periods of time. Existing train and vessel traffic currently creates these impacts and other increases in non-project traffic will also continue to create them. According to the analysis in the DEIS, any purported increase in rail and vessel traffic attributable to the Project is minor. The analysis and recommendation do not acknowledge that any purported impacts occur from existing rail and vessel traffic and will increase from non-project related increases in rail and vessel traffic. Accordingly the rail and vessel traffic associated with this

project does not create an impact distinguishable from the no-action alternative such that any purported impacts are not attributable to this project.

Section 3.8.5, Mitigation, page 3.8-18

This section of the DEIS correctly notes that the Applicant has submitted drafts of various facility planning documents that either have been submitted in draft form, or would be submitted prior to construction or operations, based on the subject matter that the plan addresses. These plans will be reviewed and finalized during EFSEC review after completion of the site certificate decision.

The DEIS proposes the following mitigation that are beyond Applicant's ability to implement or to control outcomes and, for that reason, should not be identified as Proposed Action mitigation:

> *EFSEC recommends further discussions or a diagnostic review with BNSF, UTC, and affected local jurisdictions concerning crossings along the rail corridor within Spokane, Cheney, Lyle, Pasco, Mesa, Bingen, and White Salmon to determine if these crossings are protected at the appropriate level.*
>
> and,
>
> *Appropriate measures should be implemented to prevent pedestrian and vehicular accidents, incidents, injuries, and fatalities at passenger stations or at grade crossings along the inbound rail route in consultation with EFSEC. Such measures include installing signs, signals, or other visual devices to warn of approaching trains; installing infrastructure at pedestrian and vehicular crossings to improve the safety of crossing railroad tracks; potential closures of at-grade crossings and/or grade separation, and installing fences to prohibit access to railroad tracks.*

This mitigation measure fails to recognize that the impacts identified are related to existing rail traffic, including the historic increases and decreases in such traffic and, as such, are a function of rail operations generally, not Project rail traffic specifically. While consultation regarding safety of at-grade crossings with appropriate agencies and the railroad may be appropriate (and are likely ongoing), as noted in this proposed mitigation measure language, these consultations do not involved the Applicant and thus should not be recommended as conditions for implementation by the Applicant or as conditions precedent to Project approval.

Additionally, as discussed in greater detail in Section 3.8.3.2 above, the proposed mitigation measure (at-grade crossing safety modifications) is not proportionate to the impact identified. SEPA provides that actions may be conditioned only to mitigate specific adverse environmental impacts, and further provides that responsibility for implementing mitigation measures may be imposed on an applicant only to the extent attributable to the identified adverse impacts of its proposal. Here, impacts are related to preexisting conditions and conditions that will exist even

under a no-action alternative. It is therefore inappropriate to require mitigation for these impacts.

Additionally, these proposed mitigation measures cannot be accomplished by the Applicant. Under SEPA, mitigation conditions must be both reasonable and "capable of being accomplished." Because these mitigation measures require activities to be undertaken by third parties outside of the control of the Applicant (including various state agencies), the Applicant has no way to ensure that these activities are accomplished. Therefore, these mitigation measures are inappropriate.

Section 3.8.6, Significant Unavoidable Impacts, page 3.8-18

As noted in the discussions above on section 3.8.3.2 and 3.8.3.3, the DEIS overstates the potential risk of incident involving boiler and steam explosions and on vessel incidents. Because neither of these impacts are probable under SEPA the classification of these impacts as Significant Unavoidable Impacts is not appropriate and the FEIS should eliminate them from this section.

Section 3.9 Noise

Review of DEIS Section 3.9 revealed numerous errors in the identification of appropriate noise standards, the noise descriptors used for portions of the analysis, the calculation methodologies used, and the conclusions identified regarding significant noise impacts, particularly in regards to the assessment of construction noise and vibration. The following comments identify in detail the errors and erroneous conclusions we found in the DEIS.

Section 3.9.2, Methods of Analysis, page 3.9-5 paragraph 2

Section 3.9.2 of the DEIS incorrectly states there are noise thresholds for construction noise established by the City of Vancouver, that are more stringent than those established in WAC.

Section 20.935.030.A of the Vancouver Municipal Code identifies the environmental noise performance standards applied to facilities in the City. This section applies the noise limits established in WAC 173-60-040 and the exemptions identified in WAC 173-60-050. WAC 173-60-050 (3) states that noise from temporary construction is exempt from the noise limits at all times, except when noise is received within Class A EDNAs between the hours of 10:00 p.m. and 7:00 a.m. This project will require temporary daytime construction activities and is not proposing noisy nighttime construction activities. Therefore, the noise limits identified in the WAC and applied by the City are not applicable to construction activities associated with this Facility.

Section 3.9.2.4, Ground Vibration Analysis, page 3.9-10

The DEIS applies inappropriate vibration impact levels for construction.

According to Chapter 12 of the 2006 FTA manual, construction vibration is primarily evaluated as it relates to the potential for building damage effects. Unless there is a particularly vibration-sensitive use, it is not common to apply the vibration annoyance criteria identified in Table 8-1 of the 2006 FTA manual to construction-related vibration. Since there are no particularly vibration-sensitive receivers within the immediate vicinity of proposed pile driving activities, the construction vibration assessment should have focused only on the damage assessment.

If one were to consider the JWC facility as a particularly sensitive use and apply the Table 8-1 vibration impact criteria to the JWC dormitories, the assessment of impact should have considered that pile driving would only occur during daytime hours. The vibration impact criteria are meant to apply to transit sources, which are expected to operate during nighttime hours. While these criteria might be appropriate for a nighttime transit source, construction is only expected to occur during daytime hours. During daytime hours when construction vibrations might occur, the JWC operates as an institutional land use with a commercial kitchen and laundry. Therefore, the vibration impact level of 75 Vdb identified for a Category 3 would have been most appropriate, and the estimated level of 74 Vdb would not be considered to result in a significant vibration impact.

Section 3.9.2.5, Proposed Facility, Table 3.9-4, page 3.9-11

Existing Sound Levels: Table 3.9-4 transposed the measured nighttime sound levels for SLM2 and SLM3. The table should be corrected in the FEIS and any analysis and conclusions relying on the erroneous information updated.

Section 3.9.3.1, Proposed Facility, page 3.9-12

Section 3.9.3.1 inappropriately applies the WAC noise limits to temporary construction activities.

The determination of moderate or major noise impacts presented in DEIS Table 3.9-6 is partially based on comparing construction noise levels to the City/State noise limits. Given that temporary construction noise is exempt from these limits, as is explained previously, any comparison to the limits or assessment of compliance is inappropriate. Furthermore, the comparison is conducted using a 24-hour L_{dn}, which is inappropriate for comparison to the City/State noise limits, which are evaluated using hourly noise descriptors. As a result, this comparison and assessment of impacts is confusing and incorrect.

Section 3.9.3.1, Proposed Facility, page 3.9-12

Section 3.9.3.1 inappropriately characterizes typical construction noise by using the L_{dn} and applying FTA noise impact criteria to evaluate construction noise.

The determination of moderate or major noise impacts presented in DEIS Table 3.9-6 is partially based on comparing construction noise levels to the FTA noise impact criteria. This is inappropriate. The FTA noise impact criteria referenced in the DEIS noise section are applicable to long-term operational noise, not temporary construction noise.

The noise impact criteria found within the 2006 FTA *Transit Noise and Vibration Impact Assessment* manual, shown in Figure 3.9-2 of the DEIS, are based in large part on the Shultz curve of community annoyance. The Schultz curve has been expanded and incorporated into the American National Standard ANSI 12.9-2005/Part 4. As stated in ANSI 12.9 Annex F.1, the Schultz curve, which is used to assess the potential for human annoyance (and related potential for significant noise impacts), should only be applied to long-term noises and not to temporary noises like construction.

Because it would be inappropriate to apply the long-term operational noise impact criteria to temporary construction activities, as explained above, the 2006 FTA manual provides different guidelines and methodologies for the assessment of construction-related noise and vibration in Chapter 12 of the 2006 FTA manual. As stated in Chapter 12, "A quantitative construction noise assessment is performed by comparing the predicted noise levels with impact criteria appropriate for the construction stage… The descriptor used for construction noise is the L_{eq}." The discussion then continues by indicating that, "No standardized criteria have been developed for assessing construction noise impact. Consequently, criteria must be developed on a project-specific basis unless local ordinances can be found to apply… While it is not the purpose of this manual to specify standardized criteria for construction noise impact, the following guidelines can be considered reasonable criteria for assessment. If these criteria are exceeded, there may be adverse community reaction." When applying the FTA methodology for the general assessment of construction noise, the guidelines in Chapter 12 identify a one-hour L_{eq} of 90 dBA for residential uses and 100 dBA for commercial and industrial uses as reasonable construction noise impact criteria, which if exceeded, may result in adverse community reaction.

Section 3.9.3.1, Proposed Facility, page 3.9-14

The DEIS indicates that it is using the general assessment methodology for assessing construction noise as identified in the 2006 FTA manual, but with updated construction equipment noise levels. However, the DEIS construction noise assessment does not consistently apply the methodology identified by FTA for the evaluation of construction noise, and the result is an inappropriate and incorrect conclusion regarding construction noise impacts.

The FTA general assessment methodology requires the following:

- The predictions include only the two noisiest pieces of equipment expected to be used in each construction phase. (The DEIS predictions included the two noisiest pieces of equipment expected to be used in each construction phase, as identified in the EPA's 1971 document.)
- All pieces of equipment are assumed to operate at the center of the project, or centerline in the case of a guideway or highway construction. (The DEIS conservatively used the nearest point of construction to each receiving property, not the center.)
- The calculated sound level (hourly L_{eq}) assumes full power for the entire hour-long period. (The DEIS inappropriately estimated a 24-hour L_{dn} instead of an hourly L_{eq}.)
- The construction equipment noise emission levels to be used in the calculations for the general assessment are listed in Table 12-1 of the 2006 FTA manual. (The DEIS used updated noise emission levels identified in the FHWA Roadway Construction Noise Model (RCNM).)
- The calculated hourly L_{eq} levels are then compared to appropriate construction noise impact levels, such as the 90 dBA for residences and 100 dBA for industrial/commercial uses identified in the 2006 FTA manual. (The DEIS inappropriately compared the calculated L_{dn} levels to the City/State operational noise limits and to the FTA noise impact criteria for operations for assessing the potential for noise impacts.)

Applying the general assessment methodologies more consistently while using the correct noise impact criteria for temporary construction activities results in the following:

- The two loudest pieces of equipment during the loudest construction phase were considered (from Table 3.9-5, this would consist of a jack hammer and derrick crane operating during the building erection phase). The calculated L_{max} level was 89.6 dBA at 50 feet.
- The two pieces of equipment were conservatively assumed to operate at the nearest point of construction to each receptor location, as identified in Table 3.9-6 of the DEIS.
- The calculated construction equipment noise emission L_{max} level of 89.6 dBA at 50 feet was used to represent the hourly L_{eq}, to represent full power for the entire hour-long period.
- Applying the above steps, the calculated construction hourly L_{eq} levels at the Fruit Valley residences, the JWC dormitories, and the Tidewater Office Building are 54, 72, and 84 dBA, respectively.
- The calculated levels of 54 and 72 dBA at locations representing residential locations are much lower than the 90 dBA suggested in the 2006 FTA manual to avoid adverse community reaction.
- The calculated level of 84 dBA at the Tidewater Office Building (a commercial receiver) is much lower than the 100 dBA suggested in the 2006 FTA manual to avoid adverse community reaction.

Because the calculated hourly L_{eq} levels are much lower than the construction noise impact criteria suggested in the FTA manual, no significant noise impacts are expected during typical construction activities. The DEIS should be updated to reflect this conclusion.

Section 3.9.3.1, Proposed Facility, pages 3.9-15 and 16

The Section in 3.9.3.1 regarding impact pile-driving and jet-grouting activities inappropriately applies the WAC noise limits to impact pile driving and jet-grouting activities (i.e., temporary construction activities).

The determination of moderate noise impacts presented in DEIS Table 3.9-8 is partially based on comparing estimated sound levels of impact pile driving and jet-grouting activities to the City/State noise limits. Given that temporary construction noise is exempt from these limits, as is explained in prior comment, any comparison to the limits or assessment of compliance is inappropriate. Furthermore, the comparison is conducted using a 24-hour L_{dn}, which is inappropriate for comparison to the City/State noise limits, which are evaluated using hourly noise descriptors. As a result, this comparison and assessment of impacts is confusing and incorrect. The DEIS should be corrected to eliminate the reference to local standards for construction noise.

Section 3.9.3.1, Proposed Facility, pages 3.9-15 and 16

Section 3.9.3.1 regarding impact pile-driving and jet-grouting activities inappropriately characterizes noise from pile driving and jet grouting (i.e., temporary construction activities) by using the L_{dn} and applying FTA noise impact criteria to these activities.

As discussed regarding the assessment of typical construction activities in prior comment, the DEIS applies inappropriate noise descriptors, impact criteria, and calculation techniques to the assessment of impact pile driving and jet grouting activities. Using these inappropriate techniques and criteria, the DEIS then identifies moderate noise impacts at the JWC dormitories from impact pile driving and jet grouting activities. The DEIS further exacerbates the error by inappropriately identifying a moderate impact as "significant."

Applying the same general assessment methodologies and the appropriate construction noise criteria discussed in prior comment to potential pile driving and jet grouting activities results in the following:

- The two loudest pieces of equipment during the loudest construction phase (pile driving would be louder than jet-grouting) would be pile driving (101.3 dBA at 50 feet) and a crane (80.6 dBA at 50 feet). See Attachment 3-3.
- The two pieces of equipment were conservatively assumed to operate at the nearest point of pile driving to each receptor location. The distances considered were 3000 feet to Fruit Valley residences, 450 feet to the JWC dormitories, and 700 feet to the Tidewater Office

Building. (The DEIS did not assess noise from pile-driving activities at the Tidewater office building, which is curious since typical construction activities were assessed for this location.)

- The calculated construction equipment noise emission L_{max} level of 101.3 dBA at 50 feet was used to represent the hourly L_{eq}, which is a very conservative assumption for pile driving activities.
- Applying the above steps, the calculated pile driving hourly L_{eq} levels at the Fruit Valley residences, the JWC dormitories, and the Tidewater Office Building are 66, 82, and 78 dBA, respectively.
- The calculated levels of 66 and 82 dBA at locations representing residential locations are much lower than the 90 dBA suggested in the 2006 FTA manual to avoid adverse community reaction.
- The calculated level of 78 dBA at the Tidewater Office Building (a commercial receiver) is much lower than the 100 dBA suggested in the 2006 FTA manual to avoid adverse community reaction.

Because the calculated hourly L_{eq} levels are much lower than the construction noise impact criteria suggested in the FTA manual, no adverse community reaction is expected, any noise impacts would be minor, and no significant noise impacts are expected during pile driving or jet grouting activities.

Section 3.9.3.1, Proposed Facility, page 3.9-20

The DEIS section on noise impacts from decommissioning states that decommissioning impacts would be similar to typical construction noise impacts. Because the DEIS incorrectly identified moderate to major impacts (i.e., significant impacts) at the JWC and Tidewater office buildings during typical construction activities (see prior comments), the DEIS also incorrectly concludes that there would be moderate to major noise impacts to the JWC and Tidewater office buildings during decommissioning activities. Following the FTA's general assessment methodology guidelines discussed in prior comments, no significant noise impacts are anticipated during typical construction activities. Therefore, no significant noise impacts are expected during decommissioning.

Section 3.9.4, No Action Alternative, page 3.9-22

The DEIS fails to reveal that even without the project, rail traffic and associated noise and vibration impacts will still occur—either from other commodities or from rail transportation of crude from mid-continent to west coast refineries or other marine terminals on the west coast using this same rail corridor.

Section 3.9.5, Mitigation Measures, page 3.9-23

The DEIS inappropriately identifies extensive mitigation measures for construction noise impacts. As presented in prior comments, the DEIS incorrectly assessed construction noise and, therefore, incorrectly concluded there was the potential for significant noise impacts. Using the correct criteria and methodology, impacts are expected to be minor. As such, no construction noise mitigation is required and the additional mitigation measures should be removed from the FEIS. Additionally, the mitigation measure regarding the hours of construction (per City code) should properly recognize that the City has and may permit waivers from those construction hours under limited circumstances. The City has done so in the past for construction activity at other sites at the Port.[74]

Section 3.9.5, Mitigation Measures, page 3.9-23

The DEIS inappropriately identifies mitigation measures for construction vibration impacts. As presented in prior comments, the DEIS used inappropriate construction vibration impact criteria for the JWC and, therefore, incorrectly concluded there was the potential for significant vibration impacts at the JWC. However, use of more appropriate vibration impact criteria reveals that no significant construction vibration impacts are expected, therefore no vibration-related mitigation are required and the additional mitigation measures should be removed from the FEIS.

Section 3.9.5, Mitigation Measures, pages 3.9-23 and 24

The DEIS Proposes the following mitigation measures related to rail traffic:

> *Establish quiet zones where conditions allow and close or replace at-grade crossings with grade separated crossings to eliminate the need to sound horns to provide a warning of the approaching train. However, only the FRA can grant a quiet zone (BNSF 2015).*
>
> *Reconstruct at-grade crossings to provide a grade separation between rail and vehicular traffic to eliminate noise from horns. See Section 3.14.5 for a discussion on mitigation for at-grade crossings.*
>
> *Use wayside horns at the intersection instead of the louder locomotive horn to substantially reduce noise. A wayside horn causes less noise impact by focusing the warning sound only on the area where it is needed, such as near residential areas.*
>
> *Use ballast on a guideway to reduce train noise 3 dB at grade and up to 5 dB on aerial structures.*

[74] Personal Communication with Mary Mattix, Port of Vancouver, 2016

Install effective barriers to break the line of sight between the noise source and the receiver which are most effective when they are closest to either the source or the receiver. If possible, acquire limited property rights for the construction of sound barriers at the receiver.

Specify equipment for grade-crossing signals that sets the level of the warning signal lower where ambient noise is lower, that minimizes the signal duration, and that minimizes signal noise in the direction of noise-sensitive receivers.

As discussed in greater detail above, the proposed mitigation measures are not proportionate to the impact identified. SEPA provides that actions may be conditioned only to mitigate specific adverse environmental impacts, and further provides that responsibility for implementing mitigation measures may be imposed on an Applicant only to the extent attributable to the identified adverse impacts of its proposal. Here, no significant impacts have been identified. Any impacts are related to preexisting conditions and conditions that will exist even under a no-action alternative. It is therefore inappropriate to require mitigation for these impacts.

Additionally, these proposed mitigation measures cannot be accomplished by the Applicant. Under SEPA, mitigation conditions must be both reasonable and "capable of being accomplished." Because these mitigation measures require activities to be undertaken by third parties outside of the control of the Applicant (such as BNSF), the Applicant has no way to ensure that these activities are accomplished. Therefore, these mitigation measures are inappropriate.

Finally, several of these proposed items are examples of proposed mitigation measures that apply to rail operations that are governed by federal law and are therefore preempted under federal law, as discussed in Section 3.0.4 above. Accordingly, EFSEC does not have authority to require this mitigation measure.

Section 3.9.5 provides a range of mitigation measures to reduce rail horn noise. Given that Table 3.9-13 has identified only a very small increase in rail activity, resulting in between a 0 dBA and 1 dBA increase in the overall L_{dn}, a similar increase in horn noise levels would be expected, and as with rail activity, this increase would be minimal and thus would not require the extensive mitigation measures identified in 3.9.5.

As discussed in comments on Section 2.6 and 2.8.2.5 above, the rail traffic associated with this facility would not be considered "additional" rail traffic, but rather fall within the historic fluctuation in rail volumes generally on this corridor. This is further reason why these proposed mitigation measures should be eliminated in the FEIS.

Section 3.9.6, Significant Unavoidable Adverse Impacts, page 3.9-24

The DEIS states that noise from construction and decommissioning would exceed regulatory for the adjacent Tidewater office building and JWC as follows:

Noise impacts at the Tidewater office building from construction and decommissioning of the proposed Facility are anticipated to be moderate to major and would exceed the regulatory limit for a commercial receiving property, but would be short term. Note, however, that commercial areas are not considered sensitive receptors for this study.

Noise impacts at the JWC from construction and decommissioning of proposed Facility elements are considered moderate but would be typical of a heavily industrialized area (as the JWC is located within an industrialized area classification). However, it would exceed the regulatory limit for a residential receptor, but would be short term.

This conclusion is not supported by adopted regulatory standards. WAC 173-60-050(3)(a) specifies that sounds emanating from temporary construction are exempt from the maximum permissible environmental noise levels.[75] As noted in Section 3.9.2, page 3.9-5 the EIS references limits established by the City of Vancouver for construction noise. The City of Vancouver Municipal Code (VMC) adopts by reference the above noted WAC.[76] Since neither the WAC nor VMC establishes regulatory limits on construction noise other than the time of day, the DEIS should correct this section and eliminate the two significant unavoidable adverse impacts identified.

Section 3.10 Land and Shoreline Use

Section 3.10, Land and Shoreline Use, general

The Applicant generally agrees with the DEIS conclusions that project construction and operations and associated rail and vessel transportation will have minor, to no adverse impacts to land and shoreline uses adjacent to the project site and along the transportation corridors, including minor to no impacts to the Waterfront Development Project.

Section 3.10.3.1, Proposed Facility, page 3.10-14, paragraph 2 and Table 3.10-4

The DEIS indicates that the Facility meets most of the shoreline master program project development standards, with exception of the proposed rail improvements which would require shoreline conditional use approval. The DEIS incorrectly concludes that a shoreline conditional use permit would be required if the Project was not an EFSEC facility. The railroad improvements are all located upland, outside of the Aquatic shoreline designation. The City of Vancouver Shoreline Master Program, Section 4.3.1.2 (City of Vancouver 2012) specifies that the Aquatic shoreline designation is assigned to lands and waters waterward of the ordinary high

[75] WAC 173-60-.050(3) "The following shall be exempt from the provisions of WAC 173-60-040, except insofar as such provisions relate to the reception of noise within Class A EDNAs between the hours of 10:00 p.m. and 7:00 a.m. (a) Sounds originating from temporary construction sites as a result of construction activity…."

[76] VMC 20.935.050(A) "Environmental Noise. Unless otherwise exempted by WAC 173-60-050, no development or use may create noise impacts, measured at the property line of the receiving property that exceed the maximum environmental noise levels established by WAC 173-60-050…."

water mark. Table 3.10-4 of the DEIS incorrectly lists railroad improvements as being located in the Aquatic shoreline designation.

Further, even if a conditional use permit would be required under the SMP, which is not the case, simply requiring a conditional use permit does not mean that the Facility is inconsistent with development standards. WAC 173-27-160 indicates the purpose of the conditional use permit as follows:

> *The purpose of a conditional use permit is to provide a system within the master program which allows flexibility in the application of use regulations in a manner consistent with the policies of RCW 90.58.020. In authorizing a conditional use, special conditions may be attached to the permit by local government or the department to prevent undesirable effects of the proposed use and/or to assure consistency of the project with the act and the local master program.*

This does not indicate that the conditional use permit is inconsistent with the local shoreline master program but rather may require special conditions to maintain consistency.

On page 3.10-13, paragraph 1, the DEIS should be modified to remove the exception language for conditional use permit approval. Suggested language is:

> *As shown, the proposed Facility would meet ~~most of~~ the SMP development standards for the Aquatic and High Intensity shoreline designations that would apply if this Project were not an EFSEC project~~, except for the proposed railroad improvements adjacent to the Columbia River, which would require shoreline conditional use approval~~.*

In addition Table 3.10-4 should be modified such that Row 17 and 18, Column 2 reads "Not Applicable" as no highway, arterial or railroad is being located in the Aquatic shoreline designation.

Section 3.11 Visual Resources

The DEIS uses a different methodology for assessing the impacts of the project construction and operations and associated rail and vessel transportation than used the PDEIS submitted to EFSEC. Nonetheless the Applicant concurs with the conclusions that impacts to visual resources would be minor.

Section 3.12 Recreation

Section 3.12.3, Impact Assessment, pages 3.12-22 to 25

The Applicant generally agree with the DEIS conclusions that project construction and operations and associated rail and vessel transportation will have minor to no adverse impacts to recreation sites and activities adjacent to the project site and along the transportation corridors, including minor to no impacts to the Waterfront Development Project.

Section 3.12.3.1, Proposed Facility, pages 3.12-22 and 23, paragraph 4

The DEIS notes that impact pile driving activities would occur within the in-water construction window that overlaps with hunting seasons around Vancouver Lake. The DEIS concludes that minor impacts from construction noise will occur to hunters and other recreationists in the Vancouver Lake Unit closest to the Facility. The DEIS does not characterize what the impact is and how that impact is minor, it simply states:

> *Construction noise from impact pile driving on hunters and other recreationists at the area is expected to be minor for those areas of Shillapoo Wildlife Area – Vancouver Unit closest to the proposed Facility, while noise impacts are not expected for other areas of the unit located at a greater distance from the proposed Facility.*

It is not clear if the impact is related to the actual hunters and recreationists themselves or the activity they are engaged in. The DEIS inappropriately uses a day-night sound level (LDN) from Table 3.9-12 as a baseline for ambient sound levels in the Shillapoo Wildlife Area. While the comparison of sound level may have some merit, the DEIS inappropriately uses an operational noise analysis for construction related impacts. The DEIS analysis assumes a 3 decibel increase in noise at Shillapoo, but does not explain how this increase is justified or how it was derived. According to table 3.9-12, there is no increase in sound level at the specified receptor (R5).

The DEIS should also consider the relative noise levels of hunting activities, such as the discharge of firearms, when considering the level of impact related to construction noise, if mitigation is appropriate or if the mitigation will be effective in mitigating the identified impact. The hunting in the Vancouver Lake Unit is typically for waterfowl or upland game birds (WDFW 2006) and requires the use of a shotgun, which produce peak noise levels (LMAX) in the range of 140 to 160 dBA. In comparison, impact pile driving produces peak noise levels (LMAX) of 110 decibels. Both noise sources are considered to be impulsive. Impact pile driving is more likely to be masked by hunting noise when firearms are discharged at the same time as an impact hammer strike. Furthermore any noise generated by hunters within the Vancouver Lake Unit will be louder and in closer proximity to adjacent parts of the Shillapoo Wildlife Area.

Section 3.12.3.2, Rail Transportation, page 3.12-24 and Table 3.12-7

The DEIS indicates that Wintler Park in the City of Vancouver is accessed by an at-grade crossing with no alternative access and is included in Table 3.12-7. It is important to note that an alternative access is available to Wintler Park that is not affected by at-grade crossing.

Specifically the City of Vancouver Waterfront Renaissance Trail provides access for pedestrian and cyclists from the west[77]. The DEIS should note this alternative access.

Section 3.12.5, Mitigation Measures, pages 3.12-25 and 26

The DEIS proposed three mitigation measures for minor impacts to recreation resources. Because the impacts are minor, all three mitigation measures are not warranted. Nevertheless, the Applicant is willing to implement the first mitigation measure, distribution of the proposed schedule of construction activities to potentially affected recreational sites.

As indicated above, the DEIS lacks adequate basis for identifying noise impacts on hunters and other recreationists resulting from construction activities and fails to consider relative noise impacts attributable to hunters' activities within the Shillapoo Wildlife Area – Vancouver Lake Unit. Because these purported noise impacts would only be minor, the Applicant requests elimination of the second mitigation measure requiring quiet times that correspond to hunting seasons.

The recreational boater safety impacts from the marine vessel traffic attributable to the vessel traffic associated with the proposed Facility are indistinguishable from impacts due to existing marine vessel traffic on the river. The DEIS further identifies recreational impacts as minor. As such, mitigation is not warranted. However, the Applicant would be willing to participate in Lower Columbia River Harbor Safety Committee efforts to develop additional boater safety educational outreach through programs such as the PTP (Prevention Through People) model used by the San Francisco Harbor Safety Committee.]

Section 3.13 Historic and Cultural Resources

The DEIS erroneously concludes that the Rail Transportation (DEIS at Sections 3.13.3.2 and 5.14.2) and Vessel Transportation (DEIS at Sections 3.13.3.3 and 5.14.3) could result in minor impacts to Reserved Fishing Rights. Based upon this conclusion, the DEIS (at Section 3.13.5) identifies potential mitigation that could result in significant unit train or vessel timing restrictions in order to reduce the perceived impacts to Usual & Accustomed (U&A) access points and travel routes during certain times of the year.

In reaching these conclusions, the DEIS (at Section 3.13) inaccurately describes the nature and scope of the reserved Treaty fishing rights held by certain Tribes. There are four Indian Tribes that have treaty fishing rights on the Columbia River below the Snake River confluence: the Yakama Nation, The Confederate Tribes of the Warm Springs Reservation, the Confederated Tribes of the Umatilla Reservation, and the Nez Perce Tribe (collectively referred to as "Treaty Tribes"). The Treaty Tribes negotiated and signed separate treaties with the United States in the

[77] See http://www.cityofvancouver.us/sites/default/files/fileattachments/parks_and_recreation/page/1737/renaissancetrail.pdf

1850s[78]. (These treaties reserved to each of these Tribes the right to take fish at usual and accustomed grounds and stations ("U&A areas")[79].

The DEIS (at Section 3.13) mistakenly refers to the "Columbia River Treaty" as granting fishing rights to the Treaty Tribes. The Columbia River Treaty is a treaty between Canada and the United States negotiated in the latter half of the twentieth century pertaining to Columbia River water storage, and did not grant fishing rights to the Treaty Tribes[80]. Instead, each of the Treaty Tribes has specific treaties (referenced above) with the United States that reserved specific rights to each of the Treaty Tribes.

The DEIS (at Sections 3.13, 3.13.2.3, and 3.13.3.2 and 3.13.3.3) inaccurately states that the Treaty Tribes have U&A areas or off-reservation fishing rights in the area of the Columbia River in the vicinity of, or downstream from, the project. However, these Tribes do not have any adjudicated Treaty fishing rights or adjudicated U&A areas in the vicinity of, or downstream from the project.. Indeed, pursuant to court orders in the *U.S. v. Oregon* treaty fishing rights litigation, since 1977, these Treaty Tribes have exercised their treaty fishing rights upstream of, or immediately adjacent to Bonneville Dam (in what is referred to as "Zone 6" by state and tribal fisheries managers)[81]. As such, there is simply no rational basis to conclude that the Treaty Tribes have U&A areas in the vicinity of the Project or in the vessel transportation corridor downstream of the proposed Facility.

The DEIS (at Section 3.13) also inaccurately states that the Confederated Tribes of Grand Ronde ("Grand Ronde") holds treaty rights to the Lower Columbia and Cowlitz River. The Grande Ronde was not a signatory to any treaty reserving off-reservation fishing rights. As a result, the only fishing right held by the Grand Ronde is limited to waterways on the Grand Ronde reservation[82]. While the Grand Ronde may have the privilege of fishing in the Columbia, as any U.S. citizen or resident of the state may, "that privilege may be granted, limited or withdrawn by the state" as required by the interests of the state. The Grand Ronde has no *treaty right* to fish on the Columbia River. Absent a treaty right, there is no rational basis to conclude that the Grand Ronde has a treaty right to the Lower Columbia and Cowlitz River, or that a U&A area for Grand Ronde exists in the vessel corridor.

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[78] Yakima, June 9, 1855 http://www.fws.gov/pacific/ea/tribal/treaties/Yakima.pdf ; Umatilla, June 9, 1855 http://www.ccrh.org/comm/river/treaties/umatillat.htm ; Warm Springs, March 8, 1859 http://www.warmsprings.com/Warmsprings/Tribal_Community/History__Culture/Treaty__Documents/Treaty_of_1855.html ; Nez Perce, June 11, 1855 http://www.ccrh.org/comm/river/treaties/nezperce.htm

[79] See e.g. U.S. v. Oregon, 302 F. Supp. 899 (D. Or. 1969.

[80] See http://www.crt2014-2024review.gov/Files/International%20Documents%20ColumbiaRiverTreaty.pdf .

[81] See e.g. United States v. Oregon, Civil No. 68-513, Order Adopting a Plan for Managing Fisheries on Stocks Originating From the Columbia River and its Tributaries Above Bonneville Dam (D. Or. Feb. 28, 1977); 2008-2017 United States v. Oregon Management Agreement.

[82] Confederated Tribes of Chehalis Indian Reservation v. State of Wash., 96 F.3d 334 (9th Cir. 1996).

The DEIS (at Section 3.13.3) also overstates the potential impacts of the proposed Facility on tribal treaty fishing rights. The actual impacts of the proposed Facility on tribal treaty rights are negligible. As described above, Treaty Tribes do not exercise treaty fishing rights within the vicinity of the Facility t or vessel corridor (with the possible limited exception of period ceremonial fisheries).[83] Furthermore, the project construction requires minimal in-water construction activities to reinforce piles for Berths 13 and 14 at the Port facilities. In-water work will have minimal impacts on aquatic resources, which the Treaty Tribes rely upon when exercising their respective treaty fishing rights. The Applicant has proposed mitigation for all water quality impacts for in-water work to mitigate any and all impacts on these aquatic resources.

Vessels accessing the proposed Facility will likewise have no impacts on tribal treaty rights. As described above, these vessels will not operate in Treaty Tribes' adjudicated U&A areas. Their impacts on the aquatic environment in the vessel corridor will likely be negligible. Vessel transport impacts on aquatic resources which the Treaty Tribes rely upon are entirely mitigated by the Applicant's proposed mitigation.

The DEIS (at Section 3.13.3.3) misstates the impact of vessel traffic on aquatic resources that the Treaty Tribes' rely upon, in part because it misstates the increase in deep draft vessel traffic on the Columbia River. The project will add one deep draft vessel transit per day into the Columbia River. The Columbia River downstream of the proposed Facility is an industrial waterway, with substantial vessel traffic. As indicated in sections 2.7 and 3.14.2.3, the vessel traffic on the Columbia River is well-established and has occurred over long periods of time. Existing vessel traffic currently creates these impacts, and other increases in non-project traffic will also continue to create them. The analysis and recommendation do not acknowledge that any purported impacts occur from existing vessel traffic and will increase from non-project related increases in vessel traffic. Accordingly the vessel traffic associated with this project does not create an impact distinguishable from the no-action alternative, such that any purported impacts are not attributable to this project, and as such, does not create an adverse impact on any aquatic resources that the Treaty Tribes may rely upon.

The DEIS (at Section 3.13.3.3) inaccurately concludes that:

> *[t]he addition of one vessel (two trips) per day through the vessel corridor may result in minor impacts including a temporary halt to fishing by tribal members in the vicinity when vessels are moving through the area, which could lead to a minor reduction in a day's catch volume.*

DEIS Sections 5.14.3 includes a similar statement. The vessel transport associated with the project will not have any impact Treaty Tribes' ability to access portions of their fishing grounds. As stated above, the vessel corridor is not located within any U&A areas and the Treaty Tribes do not exercise their treaty rights within the vessel corridor. Indeed, the 31 fishing sites set aside for the exclusive use of the Indian fisher identified by the DEIS are all

[83] See e.g. WAC 220-32-060.

located between McNary and Bonneville dams (DEIS at Section 3.13-14). Obviously, the sites' locations between Bonneville and McNary Dams mean that vessel traffic in marine vessel corridor downstream of Vancouver will have no impacts on the Tribes' fishing rights at those sites. Furthermore, the vessel corridor is located on a portion of the Columbia River, which is a busy, industrial waterway. Even if some tribal fishing sites existed in the project vicinity or downstream, there would only be negligible impacts on that tribal fishing due to one additional vessel transit per day. There is no rational basis to conclude that the proposed Facility will have minor impacts on the exercise of Treaty fishing rights.

The DEIS overstates the impacts of the proposed Facility on the aquatic resources that the Treaty Tribes rely upon when exercising their treaty fishing rights. The Applicant's comments on the DEIS findings and conclusions regarding these potential impacts (such as the impact from vessel wakes on fisheries and vegetation resources) are provided in its comments on DEIS Section 3.6 and incorporated here.

The DEIS (at Section 3.13.3.3) concludes:

> *… an additional four trains per day using the inbound rail route could reduce access to U&A areas in places with at-grade crossings, including gillnet sites, boat launches, and fishing fleets in or near the Columbia River*.

DEIS Section 5.14.2 also includes a similar statement. The DEIS identifies 31 sites that occur between the McNary and Bonneville Dams[84]. Although the degree in which an additional four trains per day reduces access at any of these 31 sites depends upon numerous factors such as the geographic location of the site in relation to the railroad tracks and the access and harvest methods by tribal fishers at specific locations, it is highly unlikely that these additional trains will impact access. This is particularly the case, since this volume of Facility related rail traffic falls within historic levels of rail traffic on the corridor generally and, as discussed in more detail under the No Action Alternative discussion at Section 2.8.2.5 above, falls within the expected volume of rail traffic that would occur on the corridor without the Facility. Given the addition of only four trains per day, absent a site specific analysis of the potential impact of an additional four trains per day on each of these 31 sites, there is no rational basis to make broad based conclusions that these additional trains reduce access at U&A areas given this minimal increase in rail traffic.

Section 3.13.3.3, Vessel Transportation, page 3.13-17

The following impact is identified in the DEIS.

> *An increase in vessel traffic and associated wakes and waves could increase shoreline erosion, which could cause degradation, destruction, or loss of archaeological resources located in*

[84] See http://www.critfc.org/about-us/columbia-river-zone-6/; http://www.critfc.org/for-tribal-fishers/in-lieutreaty-fishing-access-sites/

susceptible areas along the shoreline. Areas vulnerable to wave erosion include reaches with actively migrating channel margins and some of the more confined valley sections, but they are not extensive. Impacts to archaeological sites would depend on the location, shoreline type, and type of archaeological site. Since archaeological resources are currently subjected to existing vessel-related disturbance, impacts caused by one additional vessel (two trips) per day are generally considered minor and may include increased erosion of shoreline sites that are more fragile (such as campsites, shell middens, and rock art). Mitigation measures identified in Section 3.6.5 to reduce impacts to aquatic species from wake stranding would also reduce this potential impact to cultural resources.

For the reasons stated in the comment on DEIS Section 3.6.5, the FEIS should modify the proposed mitigation to reflect that the minor impacts from wake effects do not warrant the mitigation measures proposed. In addition, to the extent there were impacts, these impacts would be addressed through the federal permitting process, which will includes a National Historic Preservation Act, Section 106 consultation process.

Section 3.13.4, No Action Alternative, page 3.13-18

The No Action Alternative concludes that:

> *…in the event that the same areas are used for a different facility, no impacts are expected to archaeological or historic resources or to reserved treaty rights under the No Action Alternative as no such resources exist at the proposed Facility site.*

However, in event the same areas are used for a different facility, it is likely that that facility would likewise rely upon rail traffic and marine vessel traffic. Furthermore, the volume of rail traffic and vessel traffic is similar with or without the project and as such, the impact from the proposed Facility on archaeological or historic resources or to reserved treaty rights compared to the impact of the no action alternative is likewise similar. This section should include recognition that other uses of the Port site that are rail and vessel dependent (given the Port's significant rail infrastructure investment at the Facility site and location on the Columbia River) and, therefore would likely have the same impacts on rail and vessel traffic and the associated impacts from that rail and vessel traffic discussed in this section.

Section 3.13.5, Mitigation Measures, page 3.13-19

The DEIS (at Section 3.13.5) identifies potential mitigation that could result in significant unit train or vessel timing restrictions in order to reduce the perceived impacts to U&A access points and travel routes during certain times of the year.

> *EFSEC will work with Indian tribes to obtain information on particularly sensitive fishing windows and to determine access points and travel routes to U&A fishing grounds along the rail and vessel routes to and from the Port from the Washington-Idaho border to the mouth of the Columbia River. This information will be used to assess whether unit train or vessel timing*

restrictions should be or could be implemented to reduce impacts to U&A access points and travel routes during certain times of the year

There is no rational basis to conclude that the proposed Facility will have even minor impacts on the exercise of Treaty fishing rights. See comments on Sections 3.13 generally, 3.13.3 and Section 5.14. Absent such impacts, there is no rational basis to include the mitigation proposed in Section 3.13.5.

This impact analysis and conclusions do not adequately consider the no-action alterative or complete the analysis necessary to directly attribute any purported impact to this project, as distinguished from baseline conditions and non-project impacts. As indicated in section 2.7 and 3.14.2.2 for rail and section 2.6 and 3.14.2.3 for vessels, the rail and vessel corridors are well-established and have been in use for long periods of time. The analysis and recommendation do not acknowledge that existing rail and vessel traffic will continue and non-project related increases in rail and vessel traffic will occur consistent with state projections. Accordingly, rail traffic associated with this facility should not be considered "additional" rail traffic because the railroad is a common carrier and maximizes the capacity of its rail lines to serve a variety of customers such that growth in rail traffic would occur under the no-action alternative. The trains associated with this Facility are part of a natural fluctuation in rail traffic. The rail traffic associated with this project does not represent an increase in traffic from the no-action alternative and any purported impacts are not attributable to this project. For vessel traffic, the increase in vessels associated with the Facility and within the historic range of vessel traffic on the Columbia River and are part of the typical fluctuation in vessel traffic on the river.

Further, as discussed in greater detail above, the proposed mitigation measure is not proportionate to the impact identified. SEPA provides that actions may be conditioned only to mitigate specific adverse environmental impacts, and further provides that responsibility for implementing mitigation measures may be imposed on an applicant only to the extent attributable to the identified adverse impacts of its proposal. Here, impacts are related to preexisting conditions and conditions that will exist even under No Action Alternative. It is therefore inappropriate to require mitigation for these impacts.

Additionally, these proposed mitigation measures cannot be accomplished by the Applicant. Under SEPA, mitigation conditions must be both reasonable and "capable of being accomplished." Because these mitigation measures require activities to be undertaken by third parties outside of the control of the Applicant, the Applicant has no way to ensure that these activities are accomplished. Therefore, these mitigation measures are inappropriate.

Finally, any attempt to impose conditions on the Facility that would purport to regulate timing or other characteristics of rail operations would be preempted under federal law, as discussed in Section 3.0.4 above. Accordingly, EFSEC does not have authority to require this mitigation measure.

Section 3.14 Transportation

The DEIS correctly recognizes that impacts from the Facility-related truck and vehicle traffic on the local road network would be minor. Additionally, while the DEIS acknowledges that impacts from Facility-related rail traffic would be minor, as discussed above, the current analysis of rail impacts in the DEIS fails to mention or account for both the typical fluctuations of rail traffic over time and the right of rail operators to conduct interstate commerce and meet economic demands on their rail lines, under which they own the land. Additionally, the analysis fails to properly account for the railroad's ability to modify operations and install new infrastructure to meet demand, which it plans to do but cannot otherwise share without compromising their economic competitiveness. The FEIS should include recognition of these rail traffic characteristics.

Section 3.14.2.2, Rail Corridor, pages 3.14-14 and 15, Table 3.14-8

The DEIS utilizes total gate downtime per day as a method of determining impacts from Facility related trains. Aggregating the total hours of delay per day is not an accurate measure of delay, since delay is only experienced if there are vehicles present when the train crosses the intersection. If trains cross an intersection in the middle of the night, when limited or no vehicles are present, vehicle delay impact does not occur and should not be included in an impact total or metric. The more appropriate measure is the average vehicle delay of 2.5 minutes per train crossing. The DEIS should be modified to eliminate the total gate downtime per day delay in assessing impacts.

Section 3.14.2.2, Rail Transportation, page 3.14-6, last paragraph and Figure 3.14-5

The DEIS notes that 4 at grade crossings are located along the delivery and return routes to the Port as follows:

> *Figure 3.14-5 shows 4 at-grade crossings and 11 grade-separated roadway-railroad crossings along the main BNSF delivery and return routes to the Port. Numerous WVFA grade separation projects along the BNSF mainline, including the recently completed "trench" project, which created a new rail entrance to the Port, have substantially reduced the number of at-grade crossings in Vancouver, thereby improving safety and reducing vehicle delays.*

As shown in Figure 3.14-5, 3 of the 4 at-grade crossings are not located along the deliver or return routes. The above noted paragraph should be modified to correct this error.

Section 3.14.2.2, Rail Corridor, page 3.14-9, Footnote 4

The DEIS states the following in regard to rail capacity:

> *Table 3.14-7 identifies the estimated number of trains (passenger and freight) per day, daily capacity, utilization, and track miles for the two rail routes analyzed based on Washington,*

Oregon, and Idaho rail plans. These data were collected and analyzed by the Applicant (BergerABAM 2014) and use information within the Washington State Rail Plan (WSDOT 2014b). As indicated in the State Rail Plan, the capacity and the number of trains are based on counts and estimates performed in 2010, 2012, and 2013…

The DEIS makes several statements about rail capacity that appear to be incorrect, unsupported, or missing key information. Because this analysis is based on incorrect information or assumptions, the underlying conclusions are also in error. EFSEC should consult with BNSF directly about this topic. BNSF has historically responded to rail capacity needs, either through operational adjustments or infrastructure improvements, and they have both stated and demonstrated this fact repeatedly. While some sections of the DEIS acknowledge this in passing, the discussion regarding capacity impacts fails to recognize this. The FEIS should correct this deficiency and change conclusions regarding rail capacity impacts.

This impact analysis does not adequately consider the no-action alterative or complete the analysis necessary to directly attribute any purported impact to this project, as distinguished from baseline conditions and non-project impacts. As indicated in Sections 2.6 and 2.8.2.5, the rail corridors are well-established and have been in use for long periods of time. The analysis and recommendation do not acknowledge that existing rail traffic will continue and non-project related increases in rail traffic will occur consistent with state projections. Accordingly, rail traffic associated with this facility should not be considered additional rail traffic because the railroad is a common carrier and maximizes the capacity of its rail lines to serve a variety of customers such that growth in rail traffic would occur under the no-action alternative. The trains associated with this Facility are part of a natural fluctuation in rail traffic. The rail traffic associated with this project does not represent an increase in traffic from the no-action alternative and any purported impacts are not attributable to this project.

Section 3.14.2.2, Vessel Corridor, page 3.13-18 and 19

This section of the DEIS describes the existing corridor. It does not provide existing baseline information on deep draft or other vessel traffic that utilize the navigation channel nor does it contain information on capacity of the navigation system. However, as noted in comments on Sections 3.1, 3.6 and 3.14.3.2 various conclusions are made regarding the impact to a variety of resources from potential increases in deep draft vessel traffic from Facility related vessels. To provide a basis on which to conduct an analysis of the impacts the DEIS should be corrected to show information on existing deep draft vessel traffic. As shown in Attachment 4-3 and in other sources (Ecology 2014), the Columbia River channel already sees a certain number of deep draft vessel trips. The DEIS should also compare the potential increases in vessel traffic associated with the Facility to this baseline amount. As noted in prior comments vessel traffic associated with the facility should not generally be compared solely to tank vessel traffic.

Section 3.14.3.2, Rail Transportation, page 3.14-23, paragraph 3

The DEIS includes the following conclusion regarding the impact of the Facility related trains on the capacity of the rail system:

> *Decisions on the use of locomotives and railroad lines are based on commercial market factors. For example, at some times of year, shipments of anhydrous ammonia10 (for fertilizer used in spring planting) are given priority (Ecology 2015). Considering that the addition of rail traffic associated with the proposed Facility would cause some segments of rail lines to approach or exceed capacity, that trains may be prioritized with some shipments experiencing delays, and that operational or physical improvements could be made to address additional rail traffic, impacts to rail transportation could be moderate to major.*

The conclusion of the impact as being moderate to major is not supported by the analysis and fails to consider the ability of the railroad to address fluctuations in demand and rail capacity. The railroad has historically dealt with demand by changing operations and/or routes and by making investment in its system. Additionally, this number of trains falls within historic ebbs and flows of rail traffic, suggesting that rail line capacity is not as fixed or precise of metric as implied by this DEIS statement.

Section 3.14.3.2, Rail Transportation, page 3.14-23, paragraph 5

The conclusion that rail facilities inside and outside of Washington would approach or exceed capacity and that the impact would be moderate to major lacks support and is not consistent with recognized practice of railroad to modify operations and or add infrastructure as necessary to accommodate rail traffic volumes and schedule needs. In fact, The DEIS makes several statements about rail capacity that appear to be incorrect, unsupported, or missing key information. Because this analysis is based on incorrect information or assumptions, the underlying conclusions are also in error. EFSEC should consult with BNSF directly about this topic and correct the onerous statements regarding rail capacity in the FEIS.

Additionally, and as noted previously, this impact analysis does not adequately consider the no-action alterative or complete the analysis necessary to directly attribute any purported impact to this project, as distinguished from baseline conditions and non-project impacts. As indicated in Sections 2.6 and 2.8.2.5 the rail corridors are well-established and have been in use for long periods of time. The analysis and recommendation do not acknowledge that existing rail traffic will continue and non-project related increases in rail traffic will occur consistent with state projections. Accordingly, rail traffic associated with this facility should not be considered "additional" rail traffic because the railroad is a "common carrier" and maximizes the capacity of its rail lines to serve a variety of customers and growth in rail traffic would occur under the no-action alternative. The project would not result in an increase in rail traffic on the main lines at all. Instead, the trains associated with this Facility are part of a natural fluctuation in rail traffic. The rail traffic associated with this project does not represent an increase in

traffic from the no-action alternative and any purported impacts are not attributable to this project.

Section 3.14.3.2, Rail Transportation, pages 3.14-24 to -28, Figure 3.14-7, and Tables 3.14-14 and -15

Section 3.14.3.2, Rail Transportation, pages 3.14-24 to -28, Figure 3.14-7, and Tables 3.14-14 and -15

The DEIS relies on a series of broad assumptions regarding the operational and demand characteristics of trains and vehicular traffic at key at-grade crossings along the Columbia River Alignment to determine gate downtimes and vehicle delays, without explanation or support of the assumptions. The EIS should include additional evaluation or explanation for the asserted delays and purported impacts. For example, how many of those at-grade crossings are near grade-separated alternatives, which would mitigate delay and any associated impact? How many of the at-grade crossings even exceed the 2,500 ADT threshold set by the FRA as potentially meriting further evaluation? Delay impacts are logically a function of number of vehicles impacted, which is not discussed in the DEIS.

As a preliminary matter, this impact analysis falsely assumes that the trains associated with the Facility represent an increase in rail traffic above what otherwise would be background conditions with the Facility. This analysis does not adequately consider the no action alternative or complete the analysis necessary to directly attribute any purported impact to trains associated with the Facility, as distinguished from baseline conditions and non-project impacts. As indicated in section 2.6 and 2.8.2.5, the rail corridors are well-established and have been in use for long periods of time. The analysis and recommendation do not acknowledge that existing rail traffic will continue and non-project related increases in rail traffic will occur consistent with state projections. Accordingly, rail traffic associated with this Facility should not be considered "additional" rail traffic because the railroad is a "common carrier" and maximizes the capacity of its rail lines to serve a variety of customers and growth in rail traffic would occur under the no-action alternative. The trains associated with the Facility would not result in an increase in rail traffic on the main lines at all. Instead, the trains associated with this Facility are part of a natural fluctuation in rail traffic. The rail traffic associated with this Facility does not represent an increase in traffic from the no-action alternative and any purported impacts are not attributable to this project. For this reason, the Applicant does not believe that the gate down-time analysis or at-grade crossing impacts is an impact of the Facility and should be eliminated as a project-related impact.

More generally, even if the train traffic was separately attributable to the Facility, the analysis in the DEIS is not sufficiently developed and thus the conclusions are not supported. The DEIS assessment of three primary impact metrics: 1) increased gate down times, 2) cumulative total delay for vehicles, and 3) cumulative maximum queue lengths, is largely incomplete as there are no comparisons to any meaningful standards or criteria and while the DEIS aggregates total hours of delay, it fails to explain a comparable context of total traffic or total traffic delays across a similar area. If the FEIS relies on any of these metrics, then a proper ratings system should be

identified for each to gauge whether the impacts of rail transportation associated with the proposed Facility are significant or not. The following specific comments are related to the analysis in the DEIS:

Table 3.14-8:

Aggregation of total hours of delay per day is a meaningless aggregation, since delay is only experienced if there are vehicles present when the train crosses the intersection. If trains cross an intersection in the middle of the night, when no or minimal vehicles are present, vehicle delay impact does not generally occur and should not be included in an impact total or metric. Additionally, aggregation of delay as characterized on page 3.14-25 of the DEIS, implies that a single vehicle will experience the delay caused by every train in that day at that crossing or, even more absurd, would experience the total hours of delay experienced across all at-grade crossing intersections along the entire corridor (stated as 90 hours of delay per day).

Page 3.14-24, paragraph 2:

The DEIS uses an assumed average train speed of 20 mph. This speed may not reflect actual conditions occurring at each at-grade rail crossing. Train speeds can vary widely between rural and urban areas, in addition to changing speed conditions due to switching, slowing, and accelerating. Correlation with average train speeds at key at-grade crossings such as those shown in Table 3.14-15 would contribute to a more realistic delay assessment.

Page 3.14-25, paragraph 3:

The DEIS defines the "magnitude of impact" to be the cumulative delay experienced by all drivers at an at-grade crossing but does not identify any criteria for assessing the significance of the impact. The Highway Capacity Manual (HCM) is referenced earlier in the DEIS as a resource for measuring driver delay at intersections, but even the HCM defines delay-based level-of-service (LOS) criteria for assessing whether intersection conditions are good (LOS "A") or poor (LOS "F"). There is no documentation in the HCM for rail crossing applications. Reliance on AADT volumes reflects average annual conditions and does not reflect the seasonality of traffic.

Page 3.14-26, paragraph 1:

The DEIS cumulates delay across almost 200 at-grade intersections to claim 90 hours of delay each day (ie, a 24-hour period). This method of accumulating delay across all times of day and all locations as if it is a single impact grossly overstates the nature (and the significance) of the impact. This methodology should be eliminated.

Page 3.14-26, paragraph 3:

The DEIS states the impacts to motorists from at-grade crossing delays associated with Facility trains could be "moderate" to "major". No criteria is identified in the DEIS to gauge whether the delays or queues from gate closures result in this level of impact. This is particularly significant since each of the intersections identified currently experiences some amount of crossing delay with existing rail traffic. To assert that an impact is "moderate" to "major" when it might not even vary from existing condition demonstrates the flaw with this approach. Without the criteria, it is difficult to determine whether the DEIS accurately characterizes the impact. The vehicle queue conditions summarized in Column 7 of Table 3.14-15 should be the primary metric for determining the impact of delays at the key at-grade crossings. The DEIS should be updated to reflect this criteria including additional information needs to further evaluate the queuing.

Page 3.14-28, Table 3.14-15:

As noted on prior comment, cumulative vehicle delay, as shown in Column 6 of the table, is not a good metric for measuring impact unless there is associated criteria that can define what levels of delay are tolerable or excessive.

The cumulative maximum queue lengths shown in Column 7 do not consider the effects of roadway geometrics and capacities for accommodating vehicle queues. For example, the queues shown may be reduced by half to reflect the fact that all of the key crossings listed have two directional approaches. Queues may be further reduced if particular crossings have two travel lanes in each direction.

Additionally, the Industrial St W 16th St crossing should be eliminated from the table as Facility trains will now bypass the West Industrial/West 16th Street crossing in Vancouver as the enter the Port.

Recognizing that the at-grade crossing impacts discussed in the DEIS are attributable to rail traffic generally and not Facility-specific rail traffic, we nonetheless suggest that the FEIS should limit any refinement of the at-grade crossing impact assessment to the first 7 of 8 key locations shown in Table 3.14-15, as Facility trains will now bypass the West Industrial/West 16th Street crossing in Vancouver. The remaining 7 at-grade crossings in Spokane Valley, Pasco, and Washougal experience 2,500 AADT or higher, which is a threshold that has been used in the rail industry[85] for screening key crossing locations along BNSF's Columbia River Alignment.

[85] Surface Transportation Board 2013. Draft Environmental Assessment CSX Transportation, Inc. – Joint Use- Louisville & Indiana Railroad Company, Inc. Docket No. FD 35523 August 2013.

Section 3.14.3.2, Rail Transportation, page 3.14-26, paragraphs 1, 2, and 3, and Table 3.14-15, page 3.14-28

The DEIS claims that 90 hours of delay per day across the state/ the percent increase in gate down time/and the urban impact during rush hours---would result in a moderate to major increase in delay. However, the classification of the impact to transportation resources is stated without appropriate context and does not consider the much higher volumes of regular non-rail traffic delays in communities across Washington, dwarfing the minor delays from the project trains.

For example, the Texas Transportation Institute (TTI) develops annual estimates of traffic congestion delay for urban areas throughout the United States[86]. The 2014[87] annual congestion data for urban areas in Washington[88], excluding those urban areas shared with another state[89], total over 170 million hours. Dividing by 250 weekdays equals an average of 682,899 hours of delay per day across the state (not including delay in rural areas or in urban areas shared with another state). A total of 90 additional hours of traffic delay across the state from project trains, as stated in the DEIS, would be 0.013 percent of traffic congestion delay across the state- by no means a moderate to major increase in delay.

The last two sentences in the last paragraph beginning on page 3.14-25 should be modified as follows:

> *When accounting for the number of affected vehicles and the number of trains on these two segments (i.e., four trains on the Vancouver to Pasco segment and eight trains on the Pasco to Washington stateline segment), the total combined vehicular delay would be 90 hours each day.*[14] <u>By comparison, the average traffic delay in urban areas across Washington exceeds 680,000 hours per day.</u> *In practice, the number of affected vehicles may be lower or higher, since traffic is not typically distributed uniformly throughout the day (TRB 2000).*

In addition, the conclusion of impacts contained in the 3rd paragraph on page 3.14-26 should be modified as follows to recognize the additional delays caused by rail traffic is not significant in the context of overall delays:

> *The incremental additional delay caused by gate downtime would be experienced at 200 roadway-railroad at-grade crossings along the 445-mile Columbia River Alignment. While the number of vehicles that would be affected based on a uniform traffic distribution would be relatively small, a*

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[86] Lomax, Tim, D. Schrank, B. Eisele. 2014. Urban Mobility Information. Texas A&M Transportation Institute. http://mobility.tamu.edu/ums/congestion-data/, accessed 10 December 2015.

[87] 2015 data for the 101 largest cities in the country is becoming available, but the data for smaller cities had not been released as of the preparation time of this analysis.

[88] Includes Seattle; Spokane; Bellington; Bremerton; Kennewick/Richland; Marysville; Mount Vernon; Olympia/ Lacey; Wenatchee; and Yakima.

[89] Excludes Portland, OR/WA; Lewiston, ID/WA; Longview, WA/OR; Walla Walla WA/OR.

much higher volume of traffic could be affected when trains pass through at-grade crossings in more urbanized areas during peak commuting periods. In addition, the project would result in insignificant to minor increases in traffic delay across the state when compared to existing sources of delay. *Given this consideration, and accounting for the fact that rail transportation would increase gate downtime delay by between 15 and 26 percent, impacts to motorists from delays at at-grade crossings resulting from rail transportation associated with the proposed Facility could be* minor ~~*moderate to major*~~.

Section 3.14.3.2, Rail Transportation, pages 3.14-28 and 29

The text describes railroad crossing locations along the rail routes that are operationally sensitive to increases in rail traffic. The text, however, does not include a source of information other than a general reference to WSDOT. The FEIS should add the source of WSDOT information (report, emailed information, conversation, etc.), and evaluate and explain whether that source is based on any standard or objective benchmark, as opposed to a statement of unsupported personal opinion.

Section 3.14.3.2, Rail Transportation, page 3.14-31

The DEIS asserts:

> *The new standards for the design and construction of rail tank cars to reduce vulnerability to breaching or failure during derailment (DOT Specification 117) issued jointly by PHMSA and FRA on May 1, 2015 include requirements for increased thickness of the of the tank shell, the addition of full height protection (head shields) at each end, improved protection for the top fittings and discharge valves, and reconfigured tank vents for automatic reclosing (see Section 4.2.4.2 for further information). These new designs and retrofits will increase the weight of rail tank cars which could lead to more track wear and subsequent maintenance (PHMSA 2015).*

The DEIS makes several statements about tank car properties, including weights and impacts to track configuration, that appear to be incorrect, unsupported, or missing key information. Because this analysis is based on incorrect information or assumptions, the underlying conclusions are also in error. EFSEC should consult with BNSF directly about this topic.

This impact analysis and conclusion does not adequately consider the no-action alterative or complete the analysis necessary to directly attribute any purported impact to this project, as distinguished from baseline conditions and non-project impacts. In the absence of this Project, other entities will continue to use and likely increase the use of the railway corridor to transport crude oil to meet the current demand of West Coast refineries for mid-continent North American crude oil. Indeed, Section 2.8.2.5 specifically acknowledges that West Coast demand:

> *….would require continued transport of crude oil by existing transportation modes (including pipelines, tanker trucks, and rail) from sources to refineries, or from sources to new or expanded crude-by-rail terminals in other West Coast locations…*

Nevertheless, this section does not analyze or acknowledge the impacts of this aspect of the no-action alternative. The specific crude oil trains associated with this project do not represent an increase in risk from the no-action alternative and any purported impacts are not directly and specifically attributable to this project.

Section 3.14.3.3, Vessel Transportation, page 3.14-31, paragraph 1

The DEIS indicates that the vessel transits from the project when combined with the baseline would represent approximately half the capacity of the navigation system. There is no information in the DEIS regarding the capacity of the navigation system. In addition, various other sections of the DEIS rely on baseline vessel information in completing impact assessments. Various sources contain information regarding the current vessel activity on the river including VEAT data (Ecology 2014) and Applicant provided information[90]. The Applicant agrees with the characterization of the impact on transportation resources as minor but the FEIS should specify the basis by which it determined the capacity of the navigation system.

Section 3.14.4, No Action Alternative, page 3.14.32

This section should include recognition that other uses of the Port site that are rail and vessel dependent (given the Port's significant rail infrastructure investment at the Facility site and its location on the Columbia River navigation channel) and, therefore would likely have the same impacts on rail and vessel traffic as the Facility.

Section 3.14.5, Mitigation Measures, page 3.14-32

The DEIS proposed the following mitigation to address Transportation impacts:

> *BNSF, UTC, WSDOT, and affected local jurisdictions should coordinate to identify the need for, and feasibility of, constructing new grade-separated railroad crossings in areas along the proposed rail routes where excessive gate downtimes and vehicular delays are anticipated.*
>
> *UTC, WSDOT, and affected local jurisdictions should coordinate to evaluate railroad crossing locations that are considered by WSDOT to be operationally sensitive to increases in train traffic to identify appropriate mitigation measures, possibly including upgrading passive crossings to active safety crossings, rerouting high-traffic routes to use existing grade-separated crossings, adding U-turns to allow drivers to easily access alternate routes, and/or installing grade-separated crossings (bridge or underpass).*
>
> *Both of these studies should be modeled after and coordinated with the study to be undertaken by the Washington State Legislature's Joint Transportation Committee (JTC) to investigate road-rail conflicts in Washington cities.*

[90] DNV/GL 2016 Vancouver Energy 2014 AIS Traffic Analysis, January 2016 (Attachment 4-3)

This proposed mitigation measure cannot be accomplished by the Applicant. Under SEPA, mitigation conditions must be both reasonable and "capable of being accomplished." Because this mitigation measure requires activities to be undertaken by third parties outside of the control of the Applicant (such as state agencies and the Washington State Legislature), the Applicant has no way to ensure that these activities are accomplished. Therefore, this mitigation measure is inappropriate and should not be included as mitigation imposed as project conditions or conditions that must be satisfied by others before the project can commence operations.

Section 3.14.6, Significant Unavoidable Adverse Impacts, page 3.14-32 and 33

The DEIS identifies the following significant unavoidable adverse impacts related to Transportation:

> *Rail transportation associated with the proposed Facility would result in incremental additional delay caused by gate downtime at 200 roadway-railroad at grade crossings along the 445-mile Columbia River Alignment. The total duration of gate downtime delay caused by a single train at each crossing, including the time needed to raise and lower the gate, is just over 5 minutes. When accounting for all of the proposed trains, the combined gate downtime delay at each at-grade crossing would be between 21 and 41 minutes per vehicle each day if a single vehicle encountered all trains in the same day. This amount represents an increase of between 15% and 26%, as compared to existing gate downtime delay at at-grade rail crossings caused by existing rail traffic.*
>
> *An increase in train traffic may cause some rail segments to approach or exceed capacity, particularly in areas of high freight movements. For these rail segments, similar impacts, including rail congestion, resulting in delays and/or queues may occur, resulting in moderate to major impacts to rail transportation. However, in the event that mitigation measures implemented to address rail congestion are effective, this level of impact could be reduced to minor or negligible levels.*

For the reasons discussed above in comments to Section 13.4.3.2, these statements regarding significant unavoidable adverse impacts are not correct, not appropriately attributable to the Facility, as distinguished from rail traffic generally and, as such, should be removed in the FEIS.

Section 3.15, Public Services and Utilities

This section of the DEIS replicates many of the errors associated with the analysis of rail gate down-time delays discussed in comment to Section 3.14, above. For all of those same reasons the impacts and mitigation measures identified in this section that are associate with at-grade crossing delays are based on incorrect or unsupported analysis, are overstated, are associated with No-Action Alternative rail traffic and for those same reasons, should be corrected or eliminated in the FEIS. There is no basis characterize these rail crossing impact issues as a major

impact attributable to the Proposed Action. See also comments regarding emergency response to an incident in comments to Chapter 4.

Section 3.15.3.2, Rail Transportation, pages 3.15-13 and 14

This section of the DEIS bases impacts on the additional gate downtime resulting from project related trains. The impacts assessment and associated mitigation measures identified for this section needs to be updated consistent with our prior comments on Section 3.14 related to the impacts on at-grade crossings. The DEIS concludes that increased delays ***could*** result in major impacts to emergency responders. In making this determination the DEIS fails to consider the baseline condition of the existing rail corridor and existing levels of rail traffic and fails to consider the availability of grade separated access. In doing this it assumes that the potential for delay and thus impact is consistent across all at-grade crossings and in all communities which is not the case. For example the City of Vancouver made substantial improvements to streets in the vicinity of the Waterfront Development Project that eliminated at-grade crossings and provided grade separated crossings eliminating potential for delays to emergency service providers from passing trains.

Section 3.15.4, No Action Alternative, pages 3.15-14

This section should include recognition that other uses of the Port site that are rail dependent (which is likely, given the Port's significant rail infrastructure investment at the Facility site) would likely have the same impacts on rail traffic and the associated impacts to public services and utilities from that rail traffic discussed in this section.

Section 3.15.5, Mitigation Measures, page 3.15-15

The DEIS proposes the following rail operations-specific mitigation:

> *Encourage BNSF to make SECURETRAK (a realtime GIS tracking program for crude-by-rail trains for use by state and/or regional fusion centers) available to emergency response vehicles in areas with at-grade crossings along the proposed rail route in Washington. BNSF should provide grants to those jurisdictions that would require technology upgrades and training in order to effectively use SECURETRAK.*
>
> *Investigate the need for and feasibility of constructing new grade-separated railroad crossings in cities along the proposed rail route to reduce impacts to emergency response times from increased train traffic and excessive gate downtimes. Such studies could be funded in part by BNSF as is currently being done for a mayor-appointed task force conducting a similar investigation in Edmonds, Washington (My Edmonds News 2015). Study participants should include BNSF, UTC, WSDOT, and affected local jurisdictions and emergency responders. See Section 3.14.5 for a discussion on mitigation for at-grade crossings. This study should be modeled after and coordinated with the JTC study to investigate road-rail conflicts in Washington cities scheduled to be completed by December 1, 2016*

The DEIS makes several statements about the SECURETRAK program that appear to be incorrect, unsupported, or missing key information. Because this analysis is based on incorrect information or assumptions, the underlying conclusions are also in error. EFSEC should consult with BNSF directly about this topic.

This proposed mitigation measure cannot be accomplished by the Applicant. The Applicant has no access to SECURETRAK and no ability to verify its suitability for the intended mitigation. Under SEPA, mitigation conditions must be both reasonable and "capable of being accomplished." Because this mitigation measure requires activities to be undertaken by third parties outside of the control of the Applicant (BNSF specifically), the Applicant has no way to ensure that these activities are accomplished. Therefore, this mitigation measure is inappropriate.

Similarly, as discussed in more detail in various sections above, the proposed DEIS mitigation measure suggested that new grade-separated crossing might be required based on Facility related rail traffic is without merit, well exceeds the proportionate share of Facility-related rail traffic, and thus exceeds SEPA mitigation authority. See SEPA impact and mitigation authority comments at Section 3.0.3 above.

3.15.6, Significant Unavoidable Adverse Impacts, Page 3.15-15

The DEIS identifies the following as a significant unavoidable adverse impact for Public Services and Utilities:

> *Delays to emergency responders (including fire protection, emergency medical service, and police protection) could occur along the rail corridor from trains associated with the proposed Facility in areas with at-grade crossings when a train is passing. The additional four unit trains per day associated with the proposed Facility would increase gate downtime by between 15% and 26% along the Columbia River Alignment. This increase in vehicle delays could constitute a major impact to emergency responders.*

As discussed above in comments to Section 3.14, this conclusion is based on an inappropriate methodology of aggregative impacts, fails to adequately recognize the rail traffic that has and would otherwise occur without the project and thus overstates the impact associated with the Facility, as distinguished from baseline conditions and non-project impacts. As indicated in sections 2.6 and 2.8.2.5, the rail corridors are well-established and have been in use for long periods of time. The analysis and recommendation do not acknowledge that existing rail traffic will continue and non-project related increases in rail traffic will occur consistent with state projections. Accordingly, rail traffic associated with this facility should not be considered "additional" rail traffic because the railroad is a "common carrier" and maximizes the capacity of its rail lines to serve a variety of customers such that growth in rail traffic would occur under the no-action alternative. The trains associated with this Facility are part of a natural fluctuation

in rail traffic. The rail traffic associated with this project does not represent an increase in traffic from the no-action alternative and any purported impacts are not attributable to this project.

As discussed in greater detail above, the DEIS incorrectly describes these impacts as significant and unavoidable. The DEIS analysis does not demonstrate a reasonable likelihood of more than a moderate adverse impact related to delays to emergency responders. The DEIS erred in concluding that any of these impacts is significant.

This section should be revised to identify no significant unavoidable adverse impacts to public services and utilities.

Section 3.16 Socioeconomics

As recognized by the DEIS, the Facility is expected to result in significant positive economic impacts to the local, regional, and state economies. These positive impacts include increases in economic activity, increases in jobs, and increases in tax revenues. In contrast, adverse economic impacts are expected to be quite limited. For example, one of the few quantified impacts was associated with potential property value impacts to properties adjacent to the rail from increased rail traffic. However, as the DEIS correctly noted, current literature indicates that these impacts are potentially zero and at most 1.5 percent for properties in close proximity to the rail line.

Section 3.16.1.5, Rail and Vessel Traffic, page 3.16-3

The DEIS identifies potential impacts from increased congestion on the rail system. While the DEIS does not quantify an aggregate effect, it does find:

> *..the average costs of carrier and shipper cost per train hour of delay was estimated to be $409.07 (2014 dollars).*[91]

However, the DEIS does not perform any analysis of system operations to determine whether any shipping delays would arise from trains delivering crude supplies to the Facility, nor does it consider the responses that the rail system operators could make to mitigate any changes in shipping times that might occur. As noted in the PDEIS, with the additional trains arising from the Facility's operations, rail utilization would range from 26 to 108 percent of rated capacity, as rated in the Washington State Rail Plan.[92] Thus, based on that assessment, except for one segment (Spokane to Pasco), there is sufficient capacity to accommodate increased rail traffic from the Facility without any capital improvements to the rail infrastructure and without adjustments to other rail traffic. However, this assumes static scheduling of train routes that do not account for the flexibility available to rail operators to route trains over routes with lower

[91] DEIS, Section 3.16.1.5, p. 3.16-3.

[92] Schatzki, Todd and Bruce Strombom, "Assessment of the Socioeconomic Impacts of the Vancouver Energy Distribution Project: Secondary Economic Impacts," September 5, 2014, Table 11, p. 27-28.

utilization. Moreover, this does not account for the opportunity rail operators have to increase segment capacity through various capital investments and operational changes. Given this operational flexibility, it is likely that additional rail traffic (if any) associated with the Facility would not lead to any meaningful changes in rail congestion.

The DEIS makes several statements about rail capacity that appear to be incorrect, unsupported, or missing key information and ignores statements repeatedly made by BNSF regarding its response to rail capacity and demand. Because this analysis is based on incorrect information or assumptions, the underlying conclusions are also in error. EFSEC should consult with BNSF directly about this topic.

Section 3.16.3.1, Proposed Facility, page 3.16-12

The DEIS mischaracterizes employment directly created by the Project. The DEIS states that:

> *A total of 239 direct full-time onsite and offsite jobs are expected to be supported during Phase I of Facility construction. Despite this number, it is anticipated the Project will require 407 part-time employees to fill the majority of these full-time positions.*

In fact, the 407 positions that will be created will reflect both full-time and part-time positions, not solely part-time positions. Consequently, the sentence should be corrected, to read:

> Onsite and offsite jobs representing ~~*A*~~ a *total of 239 direct full-time* ~~*onsite and offsite jobs*~~ equivalent positions *are expected to be supported during Phase I of Facility construction.* Despite this number, *it is anticipated the Project* ~~*will require 407 part-time employees to fill the majority of these full-time positions*~~ employment will be filled through an estimated 407 employees, including full-time and part-time positions.

Section 3.16.3.1, Proposed Facility, page 3.16-12

The following sentence incorrectly identifies the assumed time period of full plant operations:

> *In addition to these jobs, the estimated direct offsite employment for operations is projected to be 211 full-time jobs during startup (2016) and 440 full-time jobs each year over the* 2017–2022 *period*

The following corrected sentence should read as follows:

> In addition to these jobs, the estimated direct offsite employment for operations is projected to be 211 full-time jobs during startup (2016) and 440 full-time jobs each year over the 2017–~~2022~~2030 period.

Section 3.16.3.2, Rail Transportation, page 3.16-15

The conclusions related to environmental justice impacts from increased gate downtimes are in error.

As a preliminary matter, the analysis is based on the flawed premise that the project will increase rail traffic and therefore increase gate downtimes. This impact analysis does not adequately consider the no-action alterative or complete the analysis necessary to directly attribute any purported impact to this project, as distinguished from baseline conditions and non-project impacts. As indicated in Sections 2.6 and 2.8.2.5, the rail corridors are well-established and have been in use for long periods of time. The analysis does not acknowledge that existing rail traffic will continue and non-project related increases in rail traffic will occur consistent with state projections. Accordingly, rail traffic associated with this Facility should not be considered additional rail traffic because the railroad is a "common carrier" and maximizes the capacity of its rail lines to serve a variety of customers and growth in rail traffic would occur under the no-action alternative. The trains associated with this Facility are part of a natural fluctuation in rail traffic. The rail traffic associated with this project does not represent an increase in traffic from the no-action alternative and any purported impacts are not attributable to this project.

Fundamentally, this project is not building rail infrastructure or choosing the course of a new rail line that will create new rail impacts on populations depending on the course. Rather, the entire impact at issue relates to the use of existing rail system with existing populations in the vicinity.

Additionally, the methodology used to reach this conclusion is flawed. First, the DEIS does not explain or justify the selection of the affected area for purposes of determining this specific impact. The term "affected area," although not defined by the regulatory guidance, should be interpreted as that area on which the proposed project will or may have an effect.[93] The scope of the geographic area considered is important to ensure that the minority and low-income populations are not being falsely inflated or deflated. The DEIS explains that the

> *The Environmental justice analysis for the rail corridor provides a more geographically specific study area than each respective county by analyzing the CTs within 0.5 mile of both sides of the*

[93] Environmental Protection Agency, Final Guidance For Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses (April 1998).

rail corridor from the Washington-Idaho border to Vancouver, Washington, and within 0.25 mile of the Columbia River from Kennewick/Pasco to Vancouver, Washington.[94]

The DEIS uses that same affected area for all types of impacts, even though the impact area for gate down-time may be different than impacts on other elements of the environment.

The environmental justice analysis incorrectly defines the affected area and the comparison population in determining whether the proposed action will have disproportionately high impacts on minority and low-income populations. The DEIS incorrectly conflates the "affected area" with individual census tracts. The Council on Environmental Quality's guidance directs agencies to "[c]onsider the composition of the ***affected area*** to determine whether low-income, minority or tribal populations are present and whether there may be disproportionately high and adverse human health or environmental effects on these populations" (emphasis added). Environmental justice impacts may be an issue if the minority population percentage of the affected area is "meaningfully greater" than the minority population percentage in the general population or other "appropriate unit of geographic analysis." By conflating the affected area with individual census tracts, the DEIS incorrectly concludes that if any of the census tracts in the affected area has a meaningfully greater percentage of low-income or minority populations, than the project will result in environmental justice impacts. The disproportionate impact determination must be based on whether the population of the entire affected area contains a meaningfully greater minority or low-income population, not whether any individual census tract within the much larger affected area contains such a population.

Finally, The DEIS does not justify its selection of the statewide population as the appropriate point of comparison with the affected area population to determine whether there are meaningfully greater minority and low-income populations in the affected area. A justification of why the state is the most appropriate comparison population should be provided. The Environmental Protection Agency's NEPA guidance on environmental justice emphasizes the importance of selecting an appropriate comparison population: "a key element here is the selection of the appropriate level of geographic analysis; that is, selecting a comparison population to which the population in the affected area will be compared to identify if there are 'meaningfully greater' percentages."[95] A more appropriate comparison may be to an area that is

[94] In contrast, the general study area, which presumably applies to the rest of the socioeconomic analysis, consists of "counties within 0.5 mile on either side of the rail corridor from the Washington-Idaho border to the Port of Vancouver and includes both Washington and Oregon counties located within 0.25 mile of the Columbia River shoreline from Pasco/Kennewick to Vancouver, Washington." The environmental justice study areas for the facility and the vessel corridor are similarly more limited than the study areas used for the socioeconomic analysis. No explanation is provided for why the environmental justice study areas are more limited than the larger socioeconomic study areas.

[95] Environmental Protection Agency, Final Guidance For Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses (April 1998).

potentially affected by the proposed action to ensure the proposed action does not somehow target low-income and minority populations if the impacts could be directed somewhere else.[96]

Section 3.16.3.2, Rail Transportation, page 3.16-14 and Appendix N, Table N-17

The DEIS quantifies income tax revenues to the state of Oregon, finding that the project would generate approximately $362,100 in income tax during both construction phases and $332,900 annually with full operations in 2017.[97] However, estimates in the DEIS actually understate the likely change in Oregon income taxes because the calculations in the DEIS reflect only a portion of Facility employment during the construction phase.[98] When accounting for all construction employment, likely Oregon income tax revenues from the Facility would be approximately $610,000.

The DEIS also notes that the additional rail activity may lead to additional railroad employment (and associated economic benefits), which are not included in the DEIS statements regarding economic impact.[99] However, because of the broad expanse of the rail system, these positions may not be filled from the local population, but from other geographic areas within the western rail system.

Section 3.16.3.2, Rail Transportation, page 3.16-15, and Appendix N Socioeconomics Tables, Table N-21

The DEIS estimates the cost of rail crossing delays to be approximately $220,660 annually once the Facility reaches full operations.[100] This value is higher than that estimated in the PDEIS due to a combination of factors, including slower assumed train speeds and a larger number of crossings analyzed. Based on this analysis, the DEIS concludes that this impact represents a "moderate cumulative effect".[101] This conclusion is unreasonable.

First, the conclusion is based on the flawed premise that the project will increase rail traffic and therefore increase gate downtimes. This impact analysis does not adequately consider the no-action alterative or complete the analysis necessary to directly attribute any purported impact to this project, as distinguished from baseline conditions and non-project impacts. As indicated in Sections 2.7 and 3.14.2.2, the rail corridors are well-established and have been in use for long

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[96] See *Communities Against Runway Expansion, Inc. v. Federal Aviation Administration,* 55 F.3d 678, 688 (D.D.C. 2004). (the agency's selection of the area of potential affects as a comparison for the area actually affected was reasonable; comparison to a larger geographic area was not required).

[97] DEIS, Table N-17, Appendix N.

[98] Calculations in Table N-18 understate likely Oregon income tax revenues in the construction phase by not considering off-site direct employment (reflecting an additional 90 full-time equivalent positions) and under-stating all Phase II construction employment (96 full-time equivalent positions, rather than 50 position, as assumed in the DEIS).

[99] DEIS, Section 3.16.3.2, p. 3.16-14.

[100] DEIS, p. 3.16-15; also, Table N-21, Appendix N.

[101] DEIS, Section 5.17.2, p. 5-43.

periods of time. The analysis and recommendation do not acknowledge that existing rail traffic will continue and non-project related increases in rail traffic will occur consistent with state projections. Accordingly, rail traffic associated with this Facility should not be considered "additional" rail traffic because the railroad is a "common carrier" and maximizes the capacity of its rail lines to serve a variety of customers and growth in rail traffic would occur under the no-action alternative. The trains associated with this Facility are part of a natural fluctuation in rail traffic. The rail traffic associated with this project does not represent an increase in traffic from the no-action alternative and any purported impacts are not attributable to this project.

Even if the purported impact could be directly attributed to the project, in comparison to the positive economic benefits created by the project, the impact associated with rail crossing delays is comparatively small. During full Facility operations, the project would lead to annual increases in labor income of approximately $90 million and annual increases in total value added (including tax revenues and proprietor income) of approximately $116 million. The annual cost of $220,660 attributed to gate-down delays therefor constitutes 0.2 percent of labor income and 0.2 percent of total value added. It is unreasonable to conclude that an impact representing less than one-half of one percent of these benefits should be considered "moderate." At most, in the context of the overall economic benefit from the project, this level of costs associated with delay should be considered minor to negligible.

Section 3.16.4, No Action Alternative, page 3.16-16

This section should include recognition that other uses of the Port site that are rail dependent (given the Port's significant rail infrastructure investment at the Facility site) and, therefore would likely have the same impacts on rail traffic and the associated socioeconomic impacts from that rail traffic discussed in this section.

Section 3.16.5, Mitigation Measures, page 3.16-17

The DEIS proposes the following mitigation measure:

> *Coordinate with BNSF to schedule shipments to reduce congestion and delay for other trains using the Spokane to Pasco segment of the Columbia River Alignment to the extent possible.*

This proposed mitigation is based on the flawed premise that the project will increase rail traffic and therefore increase gate downtimes. This proposed mitigation does not adequately consider the no-action alterative or complete the analysis necessary to directly attribute any purported impact to this project, as distinguished from baseline conditions and non-project impacts. As indicated in Sections 2.6 and 3.14.2.2, the rail corridors are well-established and have been in use for long periods of time. The analysis and recommendation do not acknowledge that existing rail traffic will continue and non-project related increases in rail traffic will occur consistent with state projections. Accordingly, rail traffic associated with this Facility should not be considered additional rail traffic because the railroad is a "common carrier" and maximizes the capacity of its rail lines to serve a variety of customers and growth in rail traffic would occur

under the no-action alternative. The trains associated with this Facility are part of a natural fluctuation in rail traffic. The rail traffic associated with this project does not represent an increase in traffic from the no-action alternative and any purported impacts are not attributable to this project.

As discussed in greater detail in Section 3.0.4 above, the proposed mitigation measure is not proportionate to the impact identified. SEPA provides that actions may be conditioned only to mitigate specific adverse environmental impacts, and further provides that responsibility for implementing mitigation measures may be imposed on an applicant only to the extent attributable to the identified adverse impacts of its proposal. Here, impacts are related to preexisting conditions and conditions that will exist even under a No Action Alternative. It is therefore inappropriate to require mitigation for these impacts.

Further, this proposed mitigation measure cannot be accomplished by the Applicant. Under SEPA, mitigation conditions must be both reasonable and "capable of being accomplished. Because this mitigation measure requires activities to be undertaken by third parties outside of the control of the Applicant, the Applicant has no way to ensure that these activities are accomplished. Therefore, this mitigation measure is inappropriate.

Finally, because this proposed mitigation measure relates directly to rail operations and rail scheduling this is an example of a proposed mitigation measure that would be preempted by federal law. Accordingly, EFSEC does not have authority to require this mitigation measure.

The DEIS also proposed the following mitigation measure:

> *Coordinate with BNSF to schedule rail shipments to avoid travel through populated areas during peak traffic times to the extent possible to reduce unequable burden to environmental justice populations.*

As discussed in greater detail in Section 3.0.4 above, the proposed mitigation measure is not proportionate to the impact identified. SEPA provides that actions may be conditioned only to mitigate specific adverse environmental impacts, and further provides that responsibility for implementing mitigation measures may be imposed on an applicant only to the extent attributable to the identified adverse impacts of its proposal. Here, impacts are related to preexisting conditions and conditions that will exist even under a No Action Alternative. It is therefore inappropriate to require mitigation for these impacts.

Further this proposed mitigation measure cannot be accomplished by the Applicant. Under SEPA, mitigation conditions must be both reasonable and "capable of being accomplished. Because this mitigation measure requires activities to be undertaken by third parties outside of the control of the Applicant, the Applicant has no way to ensure that these activities are accomplished. Therefore, this mitigation measure is inappropriate.

Finally, because this proposed mitigation measure relates directly to rail operations and rail scheduling, this is an example of a proposed mitigation measure that would be preempted by federal law. Accordingly, EFSEC does not have authority to require this mitigation measure.

Section 3.16.6, Significant Unavoidable Impacts, page 3.16-17

The DEIS characterizes the following impact as a significant and unavoidable adverse impact:

> *The addition of rail traffic associated with the proposed Facility would cause some segments of rail lines to approach or exceed capacity, with some shipments experiencing delays, costing rail carriers and shippers a combined $409.07 for each hour of train delay time accrued.*

For the reasons discussed in Section 3.16.1.5 above, the DEIS improperly characterizes this impact, even though it does not quantify the aggregate impact. For the same reasons, this impact is not a significant unavoidable adverse impact. As discussed in section 3.0.3 above, the DEIS analysis does not demonstrate a reasonable likelihood of more than a moderate adverse impact related to train traffic delays. The DEIS erred in concluding that this impact is significant.

The DEIS characterizes the following impact as a significant and unavoidable adverse impact:

> *Trains traveling to the proposed Facility would increase gate downtime delay at all roadway-railroad at-grade crossings resulting in costs for personal and business travelers, which can be translated into an annualized economic cost of approximately $220,660.*

For the reasons discussed in Section 3.16.3.2 above, the DEIS improperly characterizes this impact as a "moderate" impact. For the same reasons, this impact is not a significant unavoidable adverse impact. (In fact the economic cost associated with delay is substantially less than the economic benefit of the project and thus should be recognized as a positive impact, not an adverse impact.) In addition, as discussed in Section 3.0.3 above, the DEIS analysis does not demonstrate a reasonable likelihood of more than a moderate adverse impact related to train-caused traffic delays. The DEIS erred in concluding that this impact is significant.

The DEIS also characterizes the following impact as a significant and unavoidable adverse impact:

> *Increased gate downtimes from increased train traffic associated with the proposed Facility would have moderate to major impacts for some minority and/or low-income populations within the rail corridor study area from motorist delays and delays in response times for emergency responders.*

For the reasons discussed in Section 3.16.3.2 above, the DEIS improperly characterizes this impact as having a moderate to major impact. For the same reasons, this impact is not a significant unavoidable adverse impact. As discussed in Section 3.0.3 above, the DEIS analysis does not demonstrate a reasonable likelihood of more than a moderate adverse impact related to train-cause traffic delays. The DEIS erred in concluding that this impact is significant.

This section should be revised to identify no significant unavoidable adverse impacts.

COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR VANCOUVER ENERGY

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Section 4.1 Introduction

The analysis in Chapter 4 suffers from several key flaws that appear repeatedly throughout the document. Those flaws are addressed immediately below. Additionally, our more specific section-by-section comments follow.

1. The Analysis of Impacts in Chapter 4 Is Inconsistent with the State Environmental Policy Act (SEPA) because It Does Not Adequately Consider Probability of Risks.

The analysis in Chapter 4 largely ignores the likelihood or frequency of any particular risk and focuses solely on the potential consequence of that risk when considering whether the risk constitutes a "significant" impact. There is a difference between the probability and consequence of risk and each is important. Ignoring the probability or frequency of a risk is a fundamental flaw to the Draft Environmental Impact Statement (DEIS) analysis in Chapter 4.

Indeed, as noted in the discussion of Section 3.03 of the DEIS, above, SEPA requires a lead agency to consider the likelihood of an event when assessing whether the impact is "significant." Under SEPA, an EIS is only required to analyze "**probable significant**, adverse environmental impact[s]."[1] The definition of "probable" for purposes of SEPA is "'likely or reasonably likely to occur . . . Probable is used to distinguish likely impacts from those that merely have a possibility of occurring, but are remote or speculative."[2] This is also reflected in the definition of "significant," which means "a ***reasonable probability*** of more than a moderate effect on the quality of the environment."[3] In applying the "probable" standard, the Washington Supreme Court has found that remote consequences need not be included in an EIS.[4] Much of this chapter (and the corresponding conclusions regarding impact and mitigation) fail to consider properly the probability or frequency of the risk, thereby violating this basic SEPA premise by characterizing as "significant" those impacts that are improbable and highly unlikely, even by its own analysis. This approach of declaring improbable events as "significant" impacts is contrary to SEPA and any efforts to exercise substantive SEPA authority from those improbable events would be illegal.

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[1] RCW 43.21C.03; see also WAC 197-11-402.

[2] WAC 197-11-782.

[3] WAC 197-11-794 (emphasis added).

[4] *Cheney v. Mountlake Terrace,* 87 Wash.2d 338, 344 (1976) ("SEPA does not require that "every remote and speculative consequence of an action be included in the EIS" and the "adequacy of an EIS must be judged by application of the rule of reason."). *See also West 514, Inc. v. County of Spokane*, 770 P.2d 1065 (1989) (supplemental EIS was not required because the plaintiff did not establish the probability or likelihood of blight resulting from the proposal).

This error is also inconsistent with generally accepted standards of risk assessment, according to which risk is typically defined as the frequency of the event occurring times the consequence of that event should it happen. See Attachment 4-1 (BakerRisk, 2016[5]).

In some instances, identified below, the DEIS seeks to explain its decision to ignore the probability of an event by asserting that the probability of an event cannot be quantified or studied. As noted below in comments to Section 4.4, the DEIS is in error. There are generally accepted methods and data available to calculate probability of a risk. When those methods and data are used to assess the probability of an event, the events that the DEIS considers to be "significant" solely on the basis of the potential consequence should be reclassified as non-significant because they are improbable and remote.[6]

A meaningful statistical analysis of potential equipment failures or other operational conditions leading to spills is possible for equipment and operations and should be the basis for reaching conclusions regarding significant impacts under SEPA. A risk-based approach would provide a scientific picture of oil spill risk from the proposed project and oil transportation. Scientific models are built to describe the likelihood and the consequences of spills and spill events involving fires. In addition, these studies consider the full range of mitigation in order to determine realistic quantitative measures of risk. As described further in comments to Section 4.1, the assessment of spill consequences for risk analysis can and should be based on data and consideration of equipment and prevention measures rather than reliance on regulatory Worst Case Discharges that are specified by regulation to set thresholds for response capabilities. Indeed, expert experiences with studies of similar facilities and operations demonstrate that the assumptions in the DEIS about the nature of the risk of the facility operations are likely incorrect and confirm the quoted statement from the EPA, that properly designed, constructed, and maintained aboveground storage tanks are highly unlikely to fail. (BakerRisk, 2016, [5]). The risks of spill and explosion events from the Facility identified in the DEIS are improbable. Additionally, to refine the qualitative rail and marine vessel transport risk assessments that the Applicant provided in the PDEIS the applicant retained experts to conduct a more thorough quantitative assessment of rail and marine vessel transportation risks. (Barkan et al., 2016[7], DNV GL, 2016[8]). The DNV GL report, in particular, also partially responds to the recommendations in the 2014 Washington State Marine and Rail Oil Transportation Study for additional Columbia River Marine Vessel risk assessment. Copies of those assessments are attached to this DEIS comment letter as Attachments 4-2 and 4-4, respectively, and are referred to in more detail later in our comments on the rail and marine vessel risk assessments contained in the DEIS.

[5] Wright, Brendan. Letter to Stephen Posner, January 22, 2016

[6] The singular focus on improbable events in the analysis overshadows the fact that those events and risks that have a higher likelihood of occurrence are also the type that can be mitigated.

[7] Barkan, P.L.,M. Rapit Saat, M.M. Ramos. 2006. Petroleum Crude Oil Unit Train Transportation Risk Analysis: Vancouver Energy Project, Jan. 2016

[8] DNV GL Vancouver Energy Terminal Quantitative Vessel Traffic Risk Assessment. January 2016

By rejecting this type of reasoned, analytical approach to risk assessment and considering only the consequence of an event, the DEIS inflates the risk of any event and concludes there are "significant unavoidable" impacts for events which are less likely than most risks that society accepts on a daily basis. For example, the DEIS presents a scenario in Section 4.10 involving one or more tank failures coupled with damage to the secondary containment berm, which could result in a very large crude oil spill at the proposed Facility. This type of improbable incident (which the DEIS admits is "unprecedented") is nevertheless characterized as "significant" and "unavoidable" simply because the "possibility cannot be totally eliminated." This approach is inconsistent with SEPA. SEPA does not require absolute certainty that a risk will be eliminated. Similarly, as described in further detail below, the DEIS describes purported impacts from the risk of a vessel explosion as "major" without any discussion of the probability of that event. As described in comments to Section 4.6.5.2, independent expert analysis that applies commonly accepted methodology confirms the likelihood of *any* fire or explosion on a ship (including events much less severe than the "major" events described in the DEIS) is measured in increments of thousands of years and confirms that any fire or explosion scenario is remote and improbable. (DNV GL, 2016[8]). These are only two examples. Others are described below. The return intervals for the types of risks discussed in Chapter 4 stand in stark contrast and far exceed the limited duration of the lease and the anticipated lifespan of the Facility. The characterization of whether these and other risks described in Chapter 4 are "significant" should be made in the context of its probability, consistent well-documented standard scientific practices to assess risks. Decisions should not be made solely based on the potential consequence of a risk.

2. The Analysis of Impacts in Chapter 4 Fails to Adequately Consider the No Action Alternative.

The discussion of risk from transport of oil by rail or vessel largely ignores the No Action Alternative and fails to complete the analysis necessary to directly attribute any purported impact to this project, as distinguished from baseline conditions and non-project impacts. In the absence of this Project, other entities will continue to use and likely increase the use of the railway corridor to transport crude oil to meet the current and future demand of West Coast refineries for mid-continent North American crude oil. Indeed, Section 2.8.2.5 specifically acknowledge that West Coast demand "….would require continued transport of crude oil by existing transportation modes (including pipelines, tanker trucks, and rail) from sources to refineries, or from sources to new or expanded crude-by-rail terminals in other West Coast locations…" In particular, while the ultimate destination may change and trains may travel further to other destinations, rail deliveries under the No Action Alternative will continue along the same route to reach refineries in Washington. Nevertheless, this chapter does not analyze or acknowledge the impacts of this aspect of the No Action Alternative. The specific crude oil trains associated with this project do not represent an increase in risk from the No Action Alternative and any purported impacts are not directly and specifically attributable to this project.

3. The Analysis Does Not Support the Detailed Conclusions Asserted in Chapter 4.

As explained further below, the discussion of risk of transportation of crude oil to the facility in Chapter 4 is not sufficiently refined to support the specific and detailed conclusions about impacts on each of the elements of the environment. There are key factors essential to understand the nature of the risk that an identified event presents to each element of the environment. For example, when assessing risk to human health and safety it is important to consider whether an incident occurs in urban/populated area or rural areas when assessing risk to human health and safety, but the DEIS fails to refine its analysis to that degree. Similarly, the DEIS failed to consider the likelihood of an incident occurring on or near surface water or where groundwater aquifer contamination is likely to occur to determine the impact to water resources and instead simply assumes impacts to those resources without supporting analysis.

While it may be true that impacts from a spill could be greater if the spill reached specifically identified resources, Chapter 4 makes no effort to quantify or study the likelihood that an already unlikely event will occur in proximity to those resources along the transportation route. Instead, Chapter 4 simply assumes those events will occur and jumps to general conclusions regarding significant unavoidable adverse impacts, in an overly summary fashion. Because these more sensitive risk locations are a relatively small portion of the rail or vessel transportation route, the risk conclusions are overstated. For example, the likelihood of a large rail spill or explosion event affecting significant portions of the assessed mile-wide rail corridor or reaching a resource would be even lower than the likelihood of the improbable large spill or explosion events. Indeed, Section 4.3 of the analysis prepared by Barkan, Saat, and Ramos quantifies the probability that a rail car incident involving a spill will occur at any average location on the rail route. (Barkan et al., 2016[7]). This very low probability event is measured in the thousands of years and does not rise to the level of significance. The probability of these events occurring in the vicinity of these resource locations is even more remote and therefore not "significant."

4. The Impact Analysis in Chapter 4 Does Not Adequately Consider Mitigating Measures When Assessing the Consequence.

Chapter 4 fails to adequately recognize planning and regulatory measures in place to respond to significant events (such as spill planning, Geographic Response Plans, etc.). While the opening sections of this chapter describe these measures, the DEIS then essentially ignores them when describing the level of impact from an incident. This omission is significant. These spill response measures are known to be effective. For example, as confirmed in a recent internal assessment of spill response actions and capabilities to a worst-case discharge, the proposed equipment and personnel response times meet and/or exceed timelines to mobilize equipment to address Geographic Response Plans in a timely manner given likely oil trajectories (see Attachment 4-5, Vancouver Energy Spill Response Exercise Report [BergerABAM 2016[9]]). There

[9] BergerABAM 2016 Vancouver Energy Spill Response Exercise Report. January 2016

are also documented large spills on rivers, which did not result in major impacts (M/V Westchester, Mississippi River 2000, M/V Eagle Otome, Sabine River, Texas).[10]

Similarly, the DEIS fails to recognize all of the safety measures built into the design, including containment at the facility, automatic shut-off valves in the pipeline, tank car design standards, and vessel design. These are important elements to the risk assessment of the facility and transport. Rather than considering these, the DEIS uses a regulatory Worst-Case Discharge used for planning purposes, and then simply assumes it will occur when assessing the significance of the impact. As noted in comments above, proper risk assessment techniques exist to assess risk in light of the specific measures that will be in place for the scenarios evaluated in the DEIS. Failure to incorporate these into the analysis constitute a fatal flaw and overstate the risk.

5. The Impact Analysis of Potential for Explosions and Spills in Chapter 4 Relies on Inaccurate Characterizations of the Behavior of Crude Oil.

As indicated in the reports prepared by Brendan Wright (see Attachment 4-6) and BakerRisk, (see Attachment 4-1) the discussion of flammability of crude oil or the health effects of spilled crude oil includes errors and overstatements that must be corrected (BakerRisk, 2016[5], Wright, 2016[11]). It is important for the DEIS to accurately define the potential scope of a fire or explosion or spill. In particular, the vernacular use of the term "explosion" describes a wide range of events, and, without adequate explanation, the connotations of the phrase "explosion" as used in this section are either misleading or could potentially be misunderstood. Indeed, in many instances the DEIS describes fire and explosion scenarios more similar to an LPG boiling liquid expanding vapor explosion ("BLEVE") that are simply not feasible or probable with crude oil in the range of conditions relevant to transportation and handling for Vancouver Energy. The manners in which crude oil behaves in an incident, especially one with a fire, is not quantified and appears to be incorrect and overstated. The DEIS must accurately define the kind of events that can occur in an accident involving crude oil in order to assess the risk and properly judge the necessary safety and emergency response considerations. Importantly, the DEIS should be consistent with standardized emergency response guidance, including the Emergency Response Guidebook ("ERG"),[12] which characterizes and prepares for hazards risks based on the accurate characterization of the behavior of flammable liquid such as crude oil (Wright, 2016[11]). With proper characterization of the behavior of crude oil, many of the events

[10] Michel, J., C. B. Henry Jr., and S. Thumm. 2002. Shoreline assessment an environmental impacts from the M/T Westchester oil spill in the Mississippi river. Spill Science & Technology Bulletin, Vol. 7, Issues 3-4, Nov. 2002, Pages 155-161.

[11] Wright, Brendan. Letter to Stephen Posner, January 22, 2016

[12] U.S. Department of Transportation PHMSA, Transport Canada, and Secretariat of Transport and Communications, *2012 Emergency Response Guidebook: A Guidebook for First Responders During the Initial Phase of a Dangerous Goods/Hazardous Materials Transportation Incident* ("ERG"), *available for download at* http://phmsa.dot.gov/preparerespond/importantdocumentsandresources.

identified in the DEIS as "significant unavoidable" adverse impacts should be re-characterized as improbable events that do not rise to the level of significance.

Section 4.1, Introduction, page 4-1

The DEIS lists factors that could lead to a crude oil release; however, the list is confusing because items are not mutually exclusive:

- *Equipment malfunction or failure;*
- *Human error or fatigue;*
- *Terrorism, sabotage, or vandalism;*
- *Powerful natural forces (e.g., earthquakes, floods, storms, landslides, mudslides, ground settlement);*
- *Metallic corrosion and/or fatigue; and*
- *Navigational error and/or loss of power.*

The last two bullets (metallic corrosion and/or fatigue, and navigational error and/or loss of power) are examples of the first two bullets (equipment malfunction or failure, and human error or fatigue).

The DEIS should correct this list by deleting the final two items, which would leave a thorough, non-repetitive list of general factors. Alternatively, if the DEIS intends to include specific examples identified in the final two bullets, it should provide similar detail of the various factors in each of the general categories. By way of example, table 5-3 of the risk assessment prepared by DNV GL lists 15 causal factors causing groundings.

Section 4.1, Introduction

The Section 4.1 uses the phrase *depending on the composition and volatility of the crude oil being transshipped*… The DEIS should use the term "properties" instead of "volatility" as there are numerous properties that affect a crude oil fire and/or explosion. Volatility is just one property of crude oil that affects how it reacts, and listing it on its own creates undue concern about that one characteristic. See the comment on volatility in Section 4.5.1.1.

Additionally, as explained in the introductory comments at the outset of the Applicant's response to Chapter 4, it is important to accurately define the potential scope of a "fire and/or explosion" that could potentially occur as the result of any of these events. The use of the term "explosion," in the vernacular, describes a wide range of events, many of which are not applicable to events involving crude oil.

Section 4.2 Proposed Facility, Rail, and Vessel (System) Safety Considerations

Section 4.2.2, Regulations for Transportation of Crude Oil by Rail, page 4-4, paragraph 1

The DEIS should not list the Surface Transportation Board (STB) here as it does not play a role in crude by rail safety regulation. The STB oversees items such as rates, not safety. Instead, the US DOT (and its agencies PHMSA and FRA) should be listed as and called out as the primary federal regulators. The DEIS should also note that the US Code of Federal Regulations (CFR) has multiple detailed sections that govern the safe transportation of hazardous materials, along with rail operations safety. Safety is the most important aspect of the federal regulatory regime, and states and municipalities should follow the federal orders and rules on crude by rail safety and transportation.

Section 4.2.2, Regulations for Transportation of Crude Oil by Rail, page 4-4, paragraph 2

The DEIS states that regulatory changes have been made in response to recent "incidents involving crude oil," however, the industry and regulatory changes have actually been made in response to incidents involving multiple hazard class 3 flammable liquids (including ethanol, crude oil, and other petroleum products). The DEIS should clarify this statement. Overall, the efforts by regulators and industry have focused on three areas: (1) Prevention, (2) Mitigation, and (3) Response.

Section 4.2.2, Regulations for Transportation of Crude Oil by Rail, page 4-4, paragraph 5

In the fifth Paragraph, the DEIS misstates the NDIC order. The order went into effect on April 1, 2015 (not in December 2014). Oil producers at the wellhead must condition the crude oil, not Shippers. The intent of the Order was to "improve the marketability and safe transportation of the crude oil" through wellhead conditioning of the crude oil to remove more light ends and essentially put a cap on vapor pressure (not volatility, per se). Then, rail facilities are required to notify NDIC when *discovering* that any crude oil tendered for shipment violates federal safety standards – the rail facilities are not required to (and it is not feasible to) test all crude oil coming into or out of the facility for light end content, vapor pressure, or volatility.

Section 4.2.2, Regulations for Transportation of Crude Oil by Rail, page 4-5, first full paragraph

In the first full paragraph of page 4-5, addresses state regulation of rail-related issues. As noted in our comments on Section 3.0.4, state and local regulation of many rail-related issues are pre-empted by federal law. This pre-emption limits UTC regulation of safety issues, as noted in the DEIS. The paragraph also generally describes the 2015 Ecology Oil Transportation study. We have included a more detailed response on the individual recommendations from the 2015 Ecology Oil Transportation study in our comments to Section 4.9.1. In the summary of the recommendations, the paragraph on page 4.2.2 lists "railcar placarding." Railcar placarding standards are a federal requirement subject solely to federal regulation to facilitate interstate and international commerce.

Section 4.2.4.1, The Proposed Facility, page 4-6

Section 4.2.4.1 is incomplete. While the DEIS states that it will provide information on relevant safety-related industry design and operation standards for each segment of the system, it does not comprehensively describe oil terminal industry safe operating practices. The DEIS should add discussion of other unlisted oil terminal industry safe operating practices described in section. See for example the extensive discussion in Section 4.16.3 of the Applicant's PDEIS, and specifically PDEIS Table 4.16-8.

Section 4.2.4.2, Transportation of Crude Oil by Rail, page 4-7

In the first paragraph of this section, the DEIS should also note that Transport Canada also jointly announced the new standards for rail tank cars, along with the US DOT agencies (PHMSA and FRA).

In addition, EFSEC has omitted consideration of several other relevant industry or project standards relevant to its review (Wright 2016). These include:

- ANSI/API Recommended Practice 3000 (API RP 3000) – Classifying and Loading of Crude Oil into Rail Tank Cars. API RP 3000 is an industry-wide practice that ensures that all crude oil shipped by rail has the proper classification and packing group assignment, along with a proper rail tank car fill and that loaded railcars are properly inspected/sealed prior to shipment. (Wright 2016).

- The Applicant would impose standard requirements on crude oil specifications (specs) and quality with all shippers in order to manage the integrity of the crude oil received at the Facility. (Wright 2016).

- The 2012 Emergency Response Guidebook, published jointly by PHMSA and Transport Canada is a regulatory-required primary guidebook for first responders during the initial phase of a hazardous materials transportation incident. This guidebook is shared with all first responders across the United States, including in Washington State. (Wright 2016).

Section 4.2.4.3, Transportation of Crude Oil by Vessel, page 4-10, first full paragraph

Section 4.2.4.3 is incomplete. While the DEIS states that it will provide information on relevant safety-related industry design and operation standards for each segment of the system, it does not comprehensively describe navigation industry safe operating practices on the Columbia River, nor does it describe oil terminal industry safe operating practices.

The DEIS should instead describe navigation safe operating practices on the Columbia River and oil terminal industry safe operating practices including, for example: Lower Columbia

River Harbor Safety Plan[13], International Regulations for Preventing Collisions at Sea 1972 (COLREGs) published by the International Maritime Organization (IMO)[14],[15]; and, Industry practices published by published by Oil Companies International Marine Forum[16]. Additionally, Section 5.2 of the analysis prepared by DNV GL, includes descriptions of risk-reducing effects of risk controls in a river environment that improve safety of vessel operations (DNV GL, 2016[8]).

Section 4.2.4.3, Transportation of Crude Oil by Vessel, page 4-10

There is a misleading discussion of pilotage in Section 4.2.4.3:

> *Vessels would employ state-licensed pilots for vessel transits in the Lower Columbia Region.*

To the extent that this sentence, in conjunction with Figure 9 in Appendix J, implies that vessels from the Project would only employ state-licensed pilots for portion of the transit from the Facility and across the Columbia River bar, the statement is in error. Figure 9 in Appendix J shows the Vancouver Energy Terminal in the "Upper Columbia River." Figure 9 in Appendix J does not align with River Pilot's understanding or definition of their transit of the Columbia River.

Vessels will be piloted for the entire transit from Facility to open water, and the Facility is in the Lower Columbia River. The statement in 4.2.4.3 and in Appendix J should be revised accordingly and Figure 9 updated to align with the Pilots definition of Lower and Upper Columbia River.

There is a misleading discussion of departure and anchorage in the river in Section 4.2.4.3:

> *Loaded vessels would not be allowed to depart the terminal unless there is an unrestricted pathway to sea, and no vessels would be allowed to anchor in the river.*

The Applicant will implement procedures that will only allow vessels calling at the Facility to depart a dock or enter the river when they can make the transit of the entire river with a minimum 2 feet of underkeel clearance and 10 feet across the bar. In addition, planned voyages for outbound Facility vessels will not include anchorage in the river. Only on advice of a River or Bar Pilot would a laden Vancouver Energy-related vessel anchor in the river to address emergent circumstances. The River and Bar Pilots have to retain this ability to make this professional judgment to effectively implement their charge of ensuring safe vessel transit. Accordingly, to the extent that the sentence in the DEIS suggests a different approach, it is incorrect.

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[13] Washington Department of Ecology. "Lower Columbia River Harbor Safety Plan". January 2013. http://www.ecy.wa.gov/programs/spills/prevention/LCHarborSafetyPlan.pdf

[14] Public Law 95-75, 91 Stat 308, 33 U.S.C. 1601-1608, 33 CFR 480, 48 FR 28634

[15] U.S. Department of Homeland Security, United States Coast Guard. Navigation Rules, Amalgamated. http://www.navcen.uscg.gov/?pageName=navRulesContent.

[16] Oil Companies International Marine Forum. Publications. http://www.ocimf.org/library/publications/

The DEIS should be revised to update the discussion concerning anchorage in the river and administrative controls by the Applicant concerning departure from the terminal as follows:

> *Loaded vessels would not be allowed to depart the terminal unless* the vessel can make the transit of the entire river with a minimum 2 feet of underkeel clearance and 10 feet across the bar ~~*there is an unrestricted pathway to sea*~~*, and* ~~*no*~~ laden *vessels would only be allowed to anchor in the river* on the advice of a River or Bar Pilot in an emergency situation.

Section 4.3, Accident Prevention and Response Plans, paragraphs 2 and 3

In the first paragraph of this section, instead of saying "Volatile vapors from a spill can create a flammable atmosphere," to be technically correct the DEIS should state "Any vapors" instead of "Volatile vapors," which avoids confusion about the impact of volatility of crude oil. See our comment on volatility in Section 4.5.1.1. More generally, the discussion of the potential for "flammable atmosphere and explosion hazards" in this section is an example of the mischaracterization of the likelihood and nature of potential "explosion" events in the DEIS that are based on underlying flawed assumptions about the behavior of crude oil (BakerRisk, 2016[5], Wright, 2016[11]).

This section of the DEIS also omits mitigation as a key strategy used by regulators and the industry to avoid damage when it states, "*Preventing oil spills is the best strategy for avoiding potential damage to human health and the environment*." For example, prevention would include avoiding derailments in the first place, and mitigation would include having tougher railcars to better withstand impact (releasing less or no crude oil).

Therefore, the DEIS should be revised as follows:

> *Preventing* and mitigating *oil spills* ~~*is*~~ are *the best* strategies~~*y*~~ *for avoiding potential damage to human health and the environment*."

The fourth bullet list in the second paragraph of this section of the DEIS should more fully explain what activities are meant by the phrase "maintenance of stable oil condition during storage/transport, including oil temperature and pressure." Per regulations and industry best practices, under regular transportation conditions, the natural variation in the condition of the oil, along with any variation in temperature and pressure are kept well within the design parameters of the railcars, storage tanks, piping, and marine vessels. Barring the effects of an emergency response situation, under normal transport conditions, the temperature or pressure would not be altered to exceed such parameters while in transport. Further, because the Project is not a refinery or other processing facility, the crude oil will also not be subject to increases in temperature or pressure while stored at the facility.

Section 4.3.3, Geographic Response Plans, pages 4-12 and 4-13

The DEIS does not include a complete description of the relevant Geographic Response Plans (GRP) along the rail and vessel corridors, including status of recent updates. For that reason, the DEIS overstates the potential for significant impact in the event of a spill. While the DEIS discusses the Spokane and Lower Columbia River GRPS in this section, the DEIS should be updated to specifically include discussion of the Middle Columbia GRP and Western Resource Response List ([WRRL], Ecology 2015), including appropriate maps of the locations of spill response equipment along the rail and vessel corridors, including the information regarding BNSF and Tesoro response equipment.

Instead, the DEIS completely omits the Middle Columbia GRP in its analysis, which covers the rail corridor from Pasco to the Bonneville Dam where it parallels the Columbia River. The Middle Columbia River GRP is divided into four pool GRPs by dams on the river; Bonneville Pool, The Dalles Pool, John Day Pool and McNary Pool (NAC 2015). Sensitive resources and responses strategies for each pool are listed in each pool GRP.

Furthermore, the DEIS fails to mention the Western Resource Response List ([WRRL], Ecology 2015[17]). The WRRL includes caches from multiple public agencies and private entities within the rail and vessel corridor (see Attachment 4-7, Spill Preparedness and Response Cache Locations, Rail and Vessel Corridors).

More generally, the DEIS needs to consider all available resources and their locations that could be deployed in the event of a spill. While the DEIS includes discussion of the general capabilities of BNSF, Clean Rivers Cooperative(CRC) and the Maritime Fire Safety Association (MFSA) there is no mention of the distribution of response resources throughout the rail and vessel corridors, nor of the types of equipment available and how they can be deployed to other locations quickly (e.g. air transported containers). There is a more complete description of these resources in the PDEIS, which should be reviewed and relevant portions included in the FEIS. *See, e.g.,* PDEIS at Section 5.18.3, pages 5-274 through 5-276.

Specifically, the DEIS also does not mention Tesoro Corporation's commitment to stage additional response equipment as described in Section 5.1.9.2 of the PDEIS. This includes:

- In Pasco, 5,000 feet of river boom and associated anchor systems, and one Current Buster number 2 on reel in a connex with blower and HPU system installed
- In Vancouver, 5,000 feet of river boom and associated anchor systems, and one Current Buster number 2 on reel in a connex with blower and HPU system installed

(Haugstad 2013).

[17] Washington Department of Ecology. 2015. Western Resource Response List. Available at http://www.ecy.wa.gov/programs/spills/preparedness/WRRL/WRRL.htm. Accessed December 23, 2015.

More generally, the discussion of BNSF's response caches is incomplete and should be revised with input from BNSF. As indicated in the Applicant's PDEIS at Section 5.1.9.2, BNSF maintains and stages specialized emergency response and spill equipment including fire protection trailers across its network. BNSF installs and maintains equipment caches at BNSF yards in Spokane, Pasco and Seattle (BNSF 2013b). Response equipment caches that can be used to respond to crude oil spills in these locations include:

- A fire trailer (Pasco), composed of two lots of 275 gallons of foam, two 625-gpm fire pumps, two 10,000-gallon bladders of water, 100 feet of fire hose, and fire monitors

- Emergency response air trailer (Pasco)

As indicated in the PDEIS, in response to the overall increase in shipments through the Spokane-Pasco-Portland corridor, BNSF has made an investment of $250,000 to stage additional response materials in Pasco, Wishram, and Portland starting in the first quarter of 2014. These caches include the following materials:

- At Wishram, five helicopter-portable containers, with a total of 2,000 feet of river boom and associated anchor systems, and a skimmer system

- In Pasco, a spill trailer containing 1,000 feet of river boom and associated anchor systems, a skimmer system, and boom vanes

- In Vancouver, a spill trailer containing 1,000 feet of river boom and associated anchor systems, a skimmer system, and boom vanes

Finally, the DEIS incorrectly states on page 4-13 first paragraph that *large areas of the inland rail corridor do not have applicable GRPs (i.e., Cheney to Pasco, Washington).* This ignores The BNSF System Emergency Response Plan (SERP) outlined in Section 4.3.9 of the DEIS, which plans for incident response preparedness for potential incidents throughout its rail system. The Plan defines how BNSF prepares and implements response procedures, including notification procedures and responder roles and responsibilities. The system-wide plan links to publicly developed plans, such as the Northwest Area Contingency Plan and the Geographic Response Plans (GRPs), implemented thereunder. BNSF assesses the presence of critical environmental resources, and develops subarea plans to ensure preparedness at sensitive locations. BNSF has conducted this planning process for the transportation of petroleum products for its Pacific Northwest operations (BNSF 2013a).[18] This planning effort assists BNSF employees, BNSF contractors, and local, state, tribal, and federal agencies during the initial phase of the response or beyond as necessary. BNSF coordinates the review of this planning effort with local, state, tribal, and federal agencies.

[18] Union Pacific railroad has conducted a similar planning exercise for crude oil trains that it delivers into Oregon (UPRR 2009).

To protect the environment and BNSF hazmat response team, as well as to ensure BNSF teams respond appropriately to crude oil incidents. BNSF documents its' response strategy in BNSF's GRPs. BNSF and GRPs that outline the types of crude oil BNSF handles, their characteristics, and how to respond safely and effectively to crude oil releases at specific locations including incidents that result in a fire or impact bodies of water.

The BNSF GRPs identify the relationship of BNSF's planned response strategies at BNSF-established Company Control Points (CCPs), with existing measures implemented under GRPs developed under the Northwest Area Contingency Plan (Ecology 2014[19]). Mapbook K14A in the PDEIS illustrates the location of BNSF's GRPs for the rail subdivision within Washington State on which crude oil would be delivered to the Proposed Action.

For each of the planning subdivisions, the BNSF GRPs:

- Identify BNSF rail track mileposts
- Illustrate the BNSF rail system in relationship to existing built and natural features of the location being planned for
- Present CCP locations in relation to rail track mileposts and existing GRP response locations

For each predetermined CCP, the BNSF GRPs present detailed information regarding:

- The exact position/location of the CCP (latitude/longitude) and site access instructions, including notifications to site owner or manager
- Waterbodies located at or near the location
- Resources at risk from an oil spill near this location; e.g., water intakes, sensitive habitats
- Site access instructions and locations for staging of response equipment
- Response strategies planned for this location and the recommended deployment of response equipment
- Equipment recommended to be deployed at the location and number of personnel required for response
- Information for notifications/contacts to secure entry at the location
- Track and worker safety precautions

In the event of an incident at a specific location, in addition to implementing the response strategies identified for the CCP, BNSF employees and contractors inform the state and federal on-scene coordinators of such actions to ensure their coordination with actions at adjacent GRP

[19] Northwest Area Committee. 2015. Middle Columbia River Geographic Response Plan. Available at http://www.ecy.wa.gov/programs/spills/preparedness/GRP/ColumbiaRiver/MidColumbiaRiver.htm. Updated October 2015.

locations. BNSF and its contractors also implement GRPs established under the Northwest Area Contingency Plan. Appendix K, Mapbook K14, illustrates the locations of BNSF and GRP strategies along the rail corridor.

More information on BNSF's SERP and GRPs is provided in the Applicant's PDEIS at Section 5.9.1.2.

Accordingly, the DEIS should incorporate BNSF GRP elements as described in the SERP and remove the statement that "large areas of the inland rail corridor do not have applicable GRPs (i.e., Cheney to Pasco, Washington)" from page 4-13.

Section 4.3.7, Industry Response Plans, page 4-18, first full paragraph

The DEIS observes that the current MFSA spill contingency plan is not designed to address spills greater than 300,000 bbl and is primarily focused on addressing spills of refined petroleum products. The typical capacity of the handymax class vessels, which would be expected to usually transport the crude oil from Vancouver Energy, is not much more than 300,000 bbl (at 319,925 bbl). Moreover, when the facility is approved, MFSA will amend its Contingency Plan and add any additional equipment necessary to meet the additional commodity types and quantities. Facility vessels would not be loaded in an amount that exceeds the MFSA spill contingency plan volumes. See WAC 173-182, Section C. As noted by the MFSA representative that testified at the public hearing, these changes and requirements would be in place before any ship called the Columbia River bound for the Facility.

Section 4.3.8.3, Oil Spill Contingency Plan, page 4-20, first full paragraph on page

The DEIS propagates an error from Section 1.4 of the Oil Spill Contingency Plan (OSCP, included in Attachment D of the DEIS), that a worst-case discharge is an unabated release over 72 hours[20]. In accordance with the requirements of WAC 173-182, and WAC 173-182-315 in particular, the actual worst-case discharge is an unabated release over 48 hours, which is correctly stated in Section 1.5 of the OSCP, and used in the trajectory analysis included in Appendix H of the OSCP.

From Section 1.5 of the OSCP:

> The trajectory analysis was completed based on a 48-hour worst-case spill condition. The trajectory analysis report is provided in Appendix H. The results of the analysis indicate that the geographic area of potential impact from an incident originating in Vancouver, Washington, within 48 hours of release is the Lower Columbia River from RM 105 (45°38'4.19"N, 122°42'10.55"W) to RM 47 (46° 8'40.52"N, 123°17'46.39"W).[21]

[20] Page 4-20 of the DEIS and Section 1.4 of the Oil Spill Contingency Plan dated 6-26-2015.

[21] Page 1-6, Section 1.5, of the Oil Spill Contingency Plan dated 6-26-2015.

Amend Section 4.3.8.3 of the DEIS as follows (as well as making appropriate corrections to the OSCP):

> *The OSCP provides the oil spill response actions that the Applicant would assume responsibility for in the case of a spill within a geographic boundary. For planning purposes, the geographic area at risk from a WCD (defined by the Applicant as an unabated release over ~~72~~ 48 hours during maximum current speeds) extends from ~~approximately 5 miles upriver from~~ the proposed Facility (river mile [RM] ~~109~~ 105) to ~~the mouth of the Columbia River and approximately 100 miles~~ River Mile 47 ~~in either direction (north or south)~~ ~~along the Washington and Oregon coastlines~~. The probable route of discharge off the proposed Facility property would follow natural drainage patterns to the south, past existing rail infrastructure, through the Terminal 4 stormwater pond located on Port of Vancouver (Port) property and into the Columbia River. All proposed Facility employees would have the authority to activate the Spill Response Team, activate spill response action contractions, and act as the Incident Commander if a designated or more senior manager is not available.*

Section 4.3.8.4, Fire and Explosion Prevention and Response Plans, pages 4-20 and 4-21

The section title and the second to last paragraph should be amended for clarity and consistency. The use of the term "explosion" is misleading and mischaracterizes the likelihood and nature of potential "explosion" events in the DEIS that are based on underlying flawed assumptions about the behavior of crude oil. As stated in comments above and in the reports prepared by Brendan Wright and BakerRisk, it is important for the DEIS to accurately define the potential scope of a fire or explosion. The vernacular use of the term "explosion" describes a wide range of events, and, without adequate explanation, the connotations of the phrase "explosion" as used in this section are misleading. The DEIS must accurately define the kind of events that can occur in an accident involving crude oil in order to properly judge the purported impacts and any resulting safety and emergency response considerations (BakerRisk, 2016[5], Wright, 2016[11]).

Section 4.3.8.4, Fire and Explosion Prevention and Response Plans, page 4-21, paragraph 2

The discussion of the fire prevention design elements is incomplete. In addition to the FPRP, a licensed Fire Protection Engineer would be involved in design documents, installation and testing. The DEIS should be revised to describe this additional step. Prior to the second full paragraph of this section, (starting with … *The Applicant would consult…*) the DEIS should include the following language:

> <u>In addition to the FPRP, a licensed Fire Protection Engineer from the State of Washington will be responsible for the 100% design documents, shop drawings, system installation and final commissioning/acceptance testing of the fire suppression and detection systems for these facilities. The respective Fire Protection Engineer will work closely with the fire department and local code enforcement agencies to ensure the</u>

systems are code compliant and within the limitations of the codes and standards adopted by the local jurisdiction applicable to these facilities.

For over two years, the Applicant has been supportive of a thorough gap analysis to evaluate existing capabilities of the Vancouver Fire Department (VFD) against industry standards for response preparedness, and has urged and continues to urge EFSEC to complete that objective assessment. Training opportunities provided by the Applicant and other entities are described in greater detail in the comment to Section 4.6.3.3 below.

Section 4.4 Likelihood of Incidents Resulting in a Crude Oil Spill and Range of Potential Spill Volumes

Section 4.4 Likelihood of Incidents Resulting in a Crude Oil Spill and Range of Potential Spill Volumes, and Section 4.4.1, Proposed Facility, pages 4-24 to 4-26

The DEIS incorrectly uses regulatory definitions of worst case spill as the basis for identifying significant adverse environmental impacts, without recognizing the difference between volumes used for response planning purposes and the volumes expected from an impact with "reasonable likelihood" of occurrence. This inappropriately conflates the SEPA definition of "significant," which includes a reasonable likelihood of more than a moderate impact, with regulatory definitions for spill planning purposes.

Worst-case discharges for spill planning purposes are specified by regulation and are designed to identify the required response capabilities at a facility. They are based on extremely unlikely events to ensure an extra measure of safety and response capability in responding to spills. *See* Ch. 173-182 WAC. Spill response planning is commonly based upon a regulatory definition of a worst-case spill size, regardless of engineered or operational constraints on the reality of such a spill.

Because worst-case spills for planning purposes do not include a reasonable likelihood component, they are not the best available way to describe potential environmental impacts and their likelihoods. As noted in introductory comments to Section 4.1, the likelihood of an event is a crucial factor when determining whether an impact is significant under SEPA. Improbable and remote events like the regulatory WCD used in the DEIS are not "probable" "significant" impacts. The reliance of the DEIS on WCD without any assessment of the probability of that event ignores the inherent difference between consequence and frequency, and bases the risk assessment exclusively on the consequence. This is a flaw and inconsistent with SEPA.

A meaningful statistical analysis of potential equipment failures or other operational conditions leading to spills is possible for equipment and operations like the Facility, vessels, and rail transport, and should be the basis for reaching conclusions regarding significant impacts under SEPA. A risk-based approach would provide a scientifically based picture of oil spill risk from the proposed project. Scientific models are built to describe the likelihood and the consequences of spills, fire/explosion at sites with major accident hazards. In addition, these studies consider

the full range of mitigation in order to determine realistic quantitative measures of risk. The assessment of spill consequences for risk analysis can and should be based on data and consideration of equipment and prevention measures in place rather than WCDs that are specified by regulation to set thresholds for response capabilities. For example, the DNV GL Quantitative Vessel Traffic Risk Assessment uses historical data for similar equipment or operations being operated globally, and applies it to the planned site operations. The resulting oil spill risk is presented in Section 10.2 of the report (DNV GL, 2016[8]).

Ultimately, the DEIS has not completed the necessary statistical analysis to support the conclusions about the risk of fire or explosion resulting from a spill or accident and instead makes unsupported assumptions about the risk without thorough analysis of the specific scientific model. DNV GL and Barkan, Saat and Ramos have provided such a risk assessment for rail and vessel transportation. (Barkan et al., 2016[7]); (DNV GL, 2016[8]). The more precise risk assessment describe in Barkan, Saat and Ramos and DNV GL reports should be incorporated in to the FEIS for a more complete assessment of the risk. The unsupported risk statements in the DEIS should be removed.

Moreover, as described below, based on expert experiences with similar facilities and operations the assumptions in the DEIS about the nature of the risk of the facility operations are likely incorrect. (BakerRisk, 2016[5]). The discussion in the DEIS of purported impacts from spill, fire and explosion events at the facility includes overstatements and errors that should be corrected. As described in the reports prepared by BakerRisk and Brendan Wright, above, the scenarios described are not consistent with how crude oil behaves (BakerRisk, 2016[5], Wright, 2016[11]).

Section 4.4 Likelihood of Incidents Resulting in a Crude Oil Spill and Range of Potential Spill Volumes, page 4-25, first full paragraph

The DEIS asserts that there are insufficient data on spill frequency from terminals and that there are insufficient data on "spill related fires and explosions" along the rail corridor and the vessel corridor.

The underlying assertion that there is insufficient data to make such a meaningful statistical analysis is incorrect. (BakerRisk, 2016,[5] DNV GL, 2016,[8] Barkan et al., 2016[7]). There are good data to support a meaningful analysis of the likelihood of fire and/or explosion (appropriately defined). Meaningful scientific models have been built to describe the likelihood and the consequences of spill, fire/explosion at sites with accident hazards. Indeed, expert experiences with studies of similar facilities and operations demonstrate that the assumptions in the DEIS about the nature of the risk of the facility operations are likely incorrect and confirm the quoted statement from the EPA, that properly designed, constructed, and maintained aboveground storage tanks are highly unlikely to fail. (BakerRisk, 2016,[5]). Similarly, expert reports on rail and vessel risk prepared for this project use data and sound methodology to assess risk. (DNV GL, 2016,[8] Barkan et al., 2016[7])

Because the conclusions in the DEIS regarding the risk of fire or explosion resulting from a spill are not supported by the analysis. The DEIS instead makes unsupported assumptions about the likelihood and consequence of that risk.

Section 4.4 Likelihood of Incidents Resulting in a Crude Oil Spill and Range of Potential Spill Volumes, page 4-25, paragraph 2

The issues of concern listed in Section 4.4 for derailments do not include conclusions from recent studies:

> *The independent analysis also provided EFSEC with the likelihood of derailments along various geographic segments of the rail corridor based on track curvature, flash flood potential, detector spacing, and train speeds, presented in Appendix E.*

Discussion in DEIS lacks a rigorous discussion on causes of derailments.

The average number of main line derailments per traffic exposure e.g. train mile or ton mile can be a useful metric to evaluate the overall trend in derailment rates over a specific period of time, or in a macro-level (e.g. nationwide with national average rate) rail transportation risk analysis. In the context and scope of the DEIS, specific rail route characteristics need to be taken into account to estimate derailment rates. The study prepared by Dr. Christopher Barkan does just this using recent data and analytical techniques to evaluate the specific infrastructure characteristics that recent research has shown to be significantly correlated with derailment rate.

Train derailments occur as a result of many different causes; however, some are much more prevalent than others. An analysis of freight train derailments from 2001 to 2010 on Class I railroads' mainline track found that broken rails or track welds were the leading cause of derailments [22, 23].

Multivariate statistical analyses of North American train derailment data, combined with information on FRA track class, method of operation (i.e. signaling system) and traffic density, showed that each of these variables had a strong, significant effect on derailment rate [24].

Earlier studies [25, 26, 27] found that higher FRA track classes had lower derailment rates, varying by more than an order of magnitude. FRA track class is a good proxy for track quality as higher

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[22] U.S. Rail Transportation of Crude Oil: Background and Issues for Congress, Dec 2014.

[23] Xiang Liu, M. Rapik Saat, Christopher P.L. Barkan, "Analysis of Causes of Major Train Derailment and Their Effect on Accident Rates," Transportation Research Record, No. 2289, 2012, pp. 154-163.

[24] Liu, X., Saat, M.R., Barkan, C.P.L. (2015). Freight-train derailment rates for railroad safety and risk analysis. Accident Analysis and Prevention (under review).

[25] Nayak, P.R., Rosenfield, D.B., Hagopian, J.H., 1983. Event probabilities and impact zones for hazardous materials accidents on railroads. Report DOT/FRA/ORD-83/20. FRA, U.S. Department of Transportation, Washington, DC.

FRA track classes are intended to ensure safe operation at higher operating speeds and therefore require a variety of more stringent engineering safety and maintenance standards [28].

Signaled trackage uses low-voltage, electric current in the rails (known as "track circuits") to detect the presence of trains in a given section. An important secondary benefit of track circuits is that they enable detection of several types of infrastructure problems, most notably broken rails, which are the leading cause of major derailments on U.S. railroad mainlines. Non-signaled trackage, on the other hand, is not equipped with track circuits, and incurs much higher derailment rates[11]. The entire route proposed in the state of Washington uses track circuits to provide train presence detection, help maintain safe train speeds and separation, and also detect broken rails and certain other problems that may affect track and rail integrity.

Another general factor that needs to be taken into account in estimating derailment rates is traffic density. Track with a higher traffic density receives more frequent track maintenance leading to higher track quality[15] and lower derailment rates[11].

More generally, as discussed in the comments to Section 4.4.2, below, the DEIS' methodology for addressing the risk of a rail incident is flawed. The DEIS makes several errors in the analysis of the likelihood that a derailment would occur, the number of cars that would derail and the likelihood that a derailed car would spill its crude oil. The analysis prepared by Barkan, Saat, and Ramos, corrects these errors (Barkan et al., 2016[7]). The FEIS should be incorporate this methodology and results.

Section 4.4.1, Proposed Facility, page 4-26, paragraph 1

This section of the DEIS incorrectly describes and overstates the facility spill risk. It uses regulatory Worst Case Discharge (WCD) to determine significance of the impact and ignores relevant design measures relevant when assessing reasonably likely discharges and SEPA significance. This ignores the SEPA requirement to consider the likelihood of the impact described in introductory comments to Section 4.1. As noted in Applicant's comments on Section 4.4 of the DEIS, the WCD from a facility spill is an extremely unlikely event. The regulatory WCD is used during facility design to determine capacity of safety berms and containment and financial assurances, including a factor of safety. While valid for planning spill response and for determining financial assurances, the WCD is not an accurate proxy for determining a risk of probable significant adverse impacts. Indeed, as noted in the DEIS itself, "the record also shows that properly designed, constructed, and maintained aboveground

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[26] Treichel, T.T., Barkan, C.P.L., 1993. Working paper on mainline freight train accident rates. Research and Test department, Association of American Railroads, Washington, DC.

[27] Anderson, R.T., Barkan, C.P.L., 2004. Railroad accident rates for use in transportation risk analysis. Transportation Research Record 1863, 88-98.

[28] Federal Railroad Administration (FRA), 2011a. 49 CFR Ch. II (10–1–11 Edition) PART 213 - Track safety standards. U.S. Department of Transportation, Washington D.C. http://www.gpo.gov/fdsys/pkg/CFR-2011-title49-vol4/pdf/CFR-2011-title49-vol4-part213.pdf.

storage tanks are highly unlikely to fail." DEIS at 4-25. A risk analysis should instead consider the potential oil volume that could escape impervious containment and potentially reach the environment and therefore it must account for the presence and reliability of engineered containment systems that are specifically designed and sized to avoid this size discharge under all likely spill scenario. The most likely risk of small releases and even unlikely large releases are likely to be contained by the facility. (BakerRisk, 2016[5]).

The primary event identified in this section of the DEIS that could lead to tank failure is a *massive earthquake*, which is also a highly unlikely event, with a recurrence measured in the thousands of years. Improbable and remote events like the WCD at issue are not "significant" impacts.

As indicated in comments to the purported impacts on each element of the environment, below, these flaws in the analysis of the frequency of potential spills from the facility undermine the DEIS conclusions that there are potential "significant" impacts from likelihood of spill from the facility. Based on the unlikely nature of the catastrophic scenarios identified in the DEIS, the facility risk does not present any significant unavoidable adverse impacts.

Section 4.4.1, Proposed Facility, page 4-26, paragraph 5

In assessing risk of transfer spills, the DEIS correlates the vessel impact volumes to the transfer volumes, but the explanation is not clear. There is inadequate explanation as to how the DEIS author arrived at the "effective" WCD to evaluate, based on vessel size, without consideration of transfer rates, volumes, and safety systems incorporated into the design to address emergency shut down and limit spill size.

Section 4.4.1 states:

> *However, the independent analysis suggests that the most "effective" WCD in this area depends on both the vessel size and the crude oil density. [The "effective" WCD is the most credible or realistic volume for a WCD based on the amount of oil that would effectively be released in the event of a vessel impact accident (collision or grounding) based on maximum possible outflow as determining by modeling (Appendix J).]*

This comparison with or analogy to collision or grounding spills is flawed because the causes, volumes, and mechanisms for collision and grounding spills are very different than transfer spills. Cargo transfer spill volumes are dependent on the transfer flow rate, specific transfer equipment, and operational practices, no on the receiving vessel size or capacity.

The DEIS should calculate possible spill volumes and estimate their associated frequencies by dividing the equipment into isolatable sections and analyzing historical failure data for each equipment part per a standardized rule set common in safety QRA studies. The analysis prepared on behalf of the Applicant by DNV GL includes this statistically based assessment of spill risk from vessel loading activities (DNV GL, 2016[8]). Section 8 of the DNV GL Quantitative Vessel Traffic Risk Assessment describes the estimated frequency and consequence of transfer-

related spills. It is also important to note that in the DNV GL study, "releases" in that specific context of transloading should not be generally interpreted as spills to a waterway. Small spills on land will be predominantly within secondary containment systems. As indicated in the study, small releases are the most likely from vessel loading activities while large spills are unlikely and improbable. In particular, larger spills from vessel loading activities of the kind assumed as the WCD in the DEIS of 1,200 bbl (or even higher) are highly improbable with associated frequency of 2.4×10^{-6} per year, which is once in 420,000 years. Accordingly, the WCD utilized in the DEIS to assess risk of spill from vessel loading activities overstates the risk. The WCD is highly improbable and not a significant adverse impact of the project.

Section 4.4.1, Proposed Facility, pages 4-25 and 4-26

The EIS erroneously considered the full contents of transfer pipelines as the "realistic" worst-case discharge for purposes of assessing the risks and impacts of this element of the Facility. As indicated in comments to Section 4.4, above, the regulatory WCD utilized for purposes of spill planning is not an appropriate benchmark or metric for purposes of a quantitative risk assessment used to assess whether a project presents significant unavoidable adverse impacts. The event is highly unlikely and does not consider system design, including, for example, the use of automatic pipeline shutoff valves throughout the transfer system. All the transfer pipelines are fully welded steel pipe. The valves on the crude piping are designed to close within 30 seconds of a system alarm that would be triggered by any of the following: operator shutdown; ESD; fire detection; gas detection; seismic sensors within the PLC cabinets; power failure; loss of air pressure; leak detection/flow control. The pumps have built in pressure relief systems and the piping includes stepped pressure relief valves to the tanks to ensure that the pressure within the piping never exceeds 150 psi. The piping is designed with expansion loops to ensure the thermal expansion stresses are mitigated/negligible in all operating conditions. The vessel loading line has a pressure return line to the tanks so that, in the event of a shutdown, the pressure would divert to the return line and flow to the tank once the pressure in the line exceeds 25 psi. This ensures that there is enough pressure to push the product into the tank even if the tank is near full capacity. With these systems design elements it is highly improbable that the regulatory WCD used for spill planning purposes would ever be reached.

Section 4.4.1, Proposed Facility, page 4-26, paragraph 3, bullet 1

The DEIS conservatively estimates a capacity of a single loaded rail car at 700 bbl. This was the typical average maximum loading for a light crude oil (such as Bakken) when the PDEIS was prepared, but it should be noted that this number does not account for the different types of crude oil, railcars, and recently updated regulations. With the new DOT-117 railcars for Bakken crude oil, actual max loadings being seen are now somewhat less at approximately 685 barrels, depending on the specification of crude oil. For relatively heavier crude oils (including dilbit), loadings could be substantially less at approximately 500 to 600 bbl. Therefore, using 700 bbl in calculations is likely more conservative than needed as the WCD. By way of reference, the

Canadian Association of Petroleum Producers (CAPP) stated the following in their annual report released in June 2015 (see page 33):

Reference: http://www.capp.ca/publications-and-statistics/crude-oil-forecast.

- Rail tank car capacity carrying light oil: 600 to 700 bbl
- Rail tank car capacity carrying heavy oil: 500 to 525 bbl

Section 4.4.2, Rail Transportation

There are several significant issues related to the methodologies, assumptions and results in determining the likelihood of incidents resulting in a crude oil spill and range of potential spill volumes during rail transportation include:

1. As explained in comments to Section 4.4, above, the DEIS lacks specificity in the derailment rate estimates utilized in the DEIS. Additionally, in estimating the average nationwide derailment severity (i.e. number of railcars derailed in a derailment) specific characteristics of the train or accident are not considered. Severity increases with derailment speed, train length and proportion of loaded cars. An alternative approach would consider analysis of the statistical distribution of cars derailed based on derailment speed, train length and the proportion of loaded cars [29].

2. The probability of a release from a railcar involved in a derailment does not consider specific tank car design, train or accident characteristics. An alternative approach using a current, up-to-date database of tank car safety performance in accidents[30] would account for tank car safety design, derailment speed and number of cars derailed. The methodology in the DEIS may result in an overestimation of the probability of a release from a railcar as it considers the US average tank car performance. The recently introduced DOT-117 or any other equivalent tank car type has enhanced safety features that would substantially reduce the probability of release.
3. The DEIS assumes that any tank car release results in loss of all its contents. Published statistical analyses of releases from non-pressure-type tank cars in accidents (the same classification for crude oil tank cars) show that only one-third of the cars lost between 80 to 100 percent of the lading while another one-third lost less than 5 percent of the lading[31,32].

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[29] Liu, X., Saat, M.R., Barkan, C.P.L. (2015). Freight-train derailment rates for railroad safety and risk analysis. Accident Analysis and Prevention (under review).
[30] Treichel, T.T. (2014). RSI-AAR Tank Car Accident Safety Research for Crude Oil and Ethanol Cars. Presentation in: NTSB Forum - Transportation of Crude Oil and Ethanol, 22-23 April 2014 Washington, DC. http://www.ntsb.gov/news/events/Documents/Panel%201_C_Todd%20Treichel.pdf
[31] Treichel, T.T. (2014). RSI-AAR Tank Car Accident Safety Research for Crude Oil and Ethanol Cars. Presentation in: NTSB Forum - Transportation of Crude Oil and Ethanol, 22-23 April 2014 Washington, DC. http://www.ntsb.gov/news/events/Documents/Panel%201_C_Todd%20Treichel.pdf

The report prepared by Barkan, Saat, and Ramos, attached to this comment letter, also assesses the risk of rail-related incidents but uses a more refined analytical methodology along with more up-to-date data and specifically accounts for the route, train and tank car characteristics (Barkan et al., 2016[7]).

Section 4.4.3, Vessel Transportation, page 4-29, paragraph 1

In general, the methodology in the DEIS related to vessel spill risk analysis is flawed. The assumptions about spill volumes are based on regulatory WCD, not risk analysis based on actual data. *See* Comments on Section 4.4. As a result, the DEIS erroneously identifies as "significant" those risks that are, by its own analysis, remote. DNV GL has prepared a risk-assessment, which applies commonly accepted methodology to define risk probability and consequence. (DNV GL, 2016[8]).

Section 4.4.3.2, Estimates of Potential Crude Oil Spill Size and Frequency during Vessel Transportation, page 4-31, first full paragraph

The DEIS should delete the following statement on page 4-31, about Table 4-7:

> *The independent analysis confirms that a large to very large spills are very uncommon but can occur, and the WCDs for such event can be substantial.*

This sentence confuses the more specific figures described above. More generally, it communicates the same flaw described earlier in comments to Section 4.1 above because it ignores the probability of the risk event and focuses exclusively on the consequence when characterizing the nature of the risk.

Section 4.5 Physical, Temporal, and Environmental Factors Affecting Crude Oil Spill Impacts

Section 4.5.1.1, Physiochemical Properties, page 4-32

The second paragraph of Section 4.5.1 on page 4-32 should be corrected to delete the statement that:

> …*different crude oils exhibit a wide range of properties*.

From a refining scientific standpoint, the statement may be accurate but, from a technical transportation safety standpoint, different crude oils are very consistent and are characterized as a hazard class 3 flammable liquid. There are different spill response considerations for lighter or heavier crude oils, but crude oil is very consistently characterized as a flammable liquid from a transportation safety standpoint.

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[32] Treichel, T.T., Hughes, J.P., Barkan, C.P.L., Sims, R.D., Phillips, E.A., Saat, M.R. (2006). Safety performance of tank cars in accidents: probability of lading loss. Report RA-05-02, RSI-AAR railroad tank car safety research and test project. Association of American Railroads, Washington, D.C

Section 4.5.1.1, Physiochemical Properties, page 4-33

The items listed on page 4-33 as important physiochemical properties should be revised because it gives undue emphasis on flashpoint, as compared to other characteristics relevant to flammability. The US Department of Energy on Literature Survey of Crude Oil Properties Relevant to Handling and Fire Safety in Transport (Published in March 2015, Section 8.1 on page 83 of that Sandia National Laboratories Report) confirms that there several parameters that define the degree of flammability of a fuel, which include the following::

> **Flashpoint:** Temperature that results in a vapor concentration in air corresponding to the lower flammability limit. When this temperature is reached, there will be a flash of flame without sustained burning. The fire point is the temperature at which sustained burning occurs and is higher than the flashpoint.
>
> **Flammability limits:** Range of vapor concentration in the air that will support combustion. These are termed lower flammability limit (LFL) and upper flammability limit (UFL).
>
> **Auto-ignition temperature:** Minimum temperature at which a fuel-air mixture ignites.
>
> **Minimum ignition energy:** Minimum energy required to ignite a flammable fuel-air mixture.
>
> **Burning velocity:** Velocity at which a fuel-air mixture issuing from a burner burns back to the burner.
>
> A fuel with a lower flashpoint, wider range of flammability limits, lower auto-ignition temperature, lower minimum ignition energy, and higher maximum burning velocity is considered more flammable. From a fuel classification and regulation standpoint, the main parameter considered relevant is the flashpoint. For operational handling, the above parameters are useful.

Section 4.5.1.1, Physiochemical Properties, page 4-33, paragraphs 3 to 5

The description of Bakken crude oil on page 4-33 should be revised. Contrary to the description in the first paragraph of the section, the North Dakota Petroleum Council 2014 study shows that Bakken crude oil has a *relatively narrow* range of characteristics. Like other light shale oil produced across the US and internationally, Bakken crude contains a *relatively higher* quantity of light ends and has a *relatively higher* vapor pressure. It is not accurate to say that Bakken crude oil has a "high" quantity of volatile hydrocarbons or vapor pressure on its own, without a statement of what that amount is compared against. All crude oil is flammable and crude oil is only one of a long list of flammable liquids, all of which are classified as Class 3 materials for purposes of transportation. It would be more accurate to state that light crude oil is more

readily ignitable than heavier crude oil, all else equal. While the last paragraph of this section includes statements to this effect, the statements in the first paragraph are misleading and should be edited.

Additionally, the last sentence of the second paragraph in the section titled Bakken Crude Oil should be revised as follows: "Other Packing Group I and II ~~oils~~ hydrocarbons can include gasoline, ~~No. 2~~fuel oil, jet fuels, West Texas Intermediate crude oil, petroleum products, dilbit, and diesel (depending on the additive package), etc."

The third paragraph of the section titled "Bakken Crude" should be revised to describe "*relatively higher* volatility and flammability," for the same reasons described above. Under certain conditions, any crude oil (like any other flammable liquids) could ignite. The NDIC order's intent was that no Bakken crude oil ship with a vapor pressure (VPCR4 per ASTM D6377, which needs to be noted since a vapor pressure number on its own without a defining test method isn't technically accurate) above 13.7 psia. Most Bakken crude production was already being conditioned to well below this vapor pressure. Ultimately, the NDIC deferred to federal preemption and rules on the classification of crude oil and definition of a hazard Class 3 flammable liquid.

Section 4.5.1.1, Physiochemical Properties

As explained in further detail in the report prepared by Brendan Wright, the DEIS contains numerous statements about the "volatility" of crude oil that are misleading or inaccurate and must be corrected (Wright, 2016[11]). The DEIS should cite to the study work currently being done by US Department of Energy (US DOE) on properties of crude oil and risk of fire and explosion in transportation. The US DOE study follows on multiple government and industry studies (including unpublished industry studies shared with the US DOT or US DOE as reference for their own studies and work).

Section 4.5.1.2, Toxicity to Humans and Other Biological Receptors

The discussion in this section of toxicity of crude oil includes overstatements that must be corrected (BakerRisk, 2016[5], Wright, 20161[11]). It is important for the DEIS to accurately define the potential health hazards of a spill based on an accurate understanding of the behavior of crude oil. The circumstances described in the section as risk scenarios are not expected to be present in the event of a release. Facility spill will typically constitute a negligible health hazard to offsite populations. (BakerRisk, 2016[5]). The project includes specific measures to protect against these risks that are not addressed in this section. The DEIS should clarify the scope of this risk and better explain this risk as associated with associated with crude oil.

Section 4.5.1.3, Flammability of Crude Oil, page 4-35

As indicated in the reports prepared by Brendan Wright and BakerRisk the discussion of flammability of crude oil includes errors and overstatements that must be corrected (BakerRisk,

2016[5], Wright, 2016[11]). It is important for the DEIS to accurately define the potential scope of a fire or explosion. The vernacular use of the term "explosion" describes a wide range of events, and, without adequate explanation, the connotations of the phrase "explosion" as used in this section are misleading. Indeed, the DEIS describes fire and explosion scenarios more similar to an LPG boiling liquid expanding vapor explosion ("BLEVE") that are simply not feasible with crude oil. The DEIS must accurately define the kind of events that can occur in an accident involving crude oil in order to properly judge the necessary safety and emergency response considerations. Importantly, the DEIS should be consistent with standardized emergency response guidance, including the Emergency Response Guidebook ("ERG"),[33] which characterizes and prepare for risks based on the accurate characterization of the behavior of flammable liquid such as crude oil.

Section 4.5.3, Releases of Crude Oil in the Terrestrial Environment, page 4-38

The DEIS, at Section 4.5.3, indicates that dilbit contains a higher concentration of higher molecular weight hydrocarbons and is therefore not as prone to evaporation and is consequently more persistent in terrestrial environments (all relative to lighter oil such as Bakken crude). However, the section fails to acknowledge that diluted bitumen does not necessarily have a greater concentration of high molecular weight hydrocarbons than other heavy crude oils have greater concentrations of high molecular weight hydrocarbons.[34] As indicated in the discussion in the section, dilbits may have more asphaltenes and resins than other heavy oils, but even this is a generalization. This inaccurate understanding and improper characterization of diluted bitumen crudes is problematic in the subsequent sections, because the authors' analysis of oil spill impacts is based on this incorrect premise.

Section 4.5.4, Releases of Crude Oil in the Freshwater Environment, and Section 4.5.5, Releases of Crude Oil in the Estuarine/Marine Environment, pages 4-38 to 4-39

The DEIS characterizes Heavy Oils broadly and appears to mischaracterize the oil proposed to be handled by the facility. The DEIS indicates that Heavy Oils have a density of 1.01 and sink; however, this project does not include any Heavy Oils with a density of 1.01 or greater. This section of the DEIS should discuss the density ranges of oils (and their fates) proposed to be handled at the facility. Earlier sections of the DEIS used API designations for Heavy Oil, which is less than 22.3 API, with anything less than API 10 having a density greater than water. The facility will not handle oil with an API of less than 18 (density = 0.946 at 60°F), where API

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[33] U.S. Department of Transportation PHMSA, Transport Canada, and Secretariat of Transport and Communications, *2012 Emergency Response Guidebook: A Guidebook for First Responders During the Initial Phase of a Dangerous Goods/Hazardous Materials Transportation Incident* ("ERG"), *available for download at* http://phmsa.dot.gov/preparerespond/importantdocumentsandresources.

[34] See http://www.ai-ees.ca/media/10927/properties_of_dilbit_and_conventional_crude_oils_-_aitf_-_final_report_revised.pdf

Gravity = (141.5/Specific Gravity) -131.5. Conclusions of impacts based on the possibility of sinking oil may be incorrect.

Any discussion of the potential for submerged or sunken oils from the facility and associated transportation would be limited to weathering processes and incorporation of suspended particulate matter or from incorporation with shoreline sediments. In a 10-day study of the dilbit Access Western Blend in Alberta, Canada, no sinking was observed in various wind and wave conditions in estuarine water salinity (Witt-Obrien 2013[35], Polaris 2014[36]). References throughout the document to instances where oil is heavier than water do not apply. Dispersed oil interaction with suspended sediment may lead to a limited portion of the oil becoming submerged or sunken. Estuaries also have higher water density relative the freshwater in the river making oil less likely to sink.

Dispersion is the break-up of bulk oil into droplets, which can be entrained into the water column through turbulence but also that would refloat if and when buoyant forces overcome turbulent forces, as in quieter or slower flowing regimes. The authors are mixing terms of dispersion and dissolution despite making note that these are different processes. Oil-water emulsions are also typically characterized as either stable, meso-stable, or unstable. The latter two naturally break down into water and oil once mixing ceases.

When oil enters the environment from spills, ruptures, or blowouts, it undergoes continuous compositional changes associated with weathering. Weathering processes include evaporation, dissolution, emulsification, sedimentation, microbial degradation and photooxidation. Weathering changes the oil's physical and toxic properties. Fresh oil is more volatile, contains more water-soluble components, floats, is not very viscous, and more readily disperses from the source. Weathered oil initially loses volatile components, which are also the most water-soluble components, and the oil becomes more viscous and more likely to coagulate as opposed to spreading out in a thin film. Over time, weathering continues to change the composition of oil until it degrades in the environment, leaving behind only small quantities of residue (e.g., tar balls). Some of the oil (especially heavier oil) may mix with water and emulsify, forming a viscous mixture that is resistant to rapid weathering and more difficult to remediate.[37]

Portions of spilled oil may adhere to shoreline materials and may infiltrate into sediments depending on oil volume and viscosity and sediment grain sizes (pore space). Where exposed, sunlight may photo-oxidize stranded oil and where unexposed biological degradation may occur. The DEIS indicates that on sandy beaches oil can penetrate up to 2 meters (Mosbech

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[35] Witt O'Briens, Polaris Applied Sciences, and Western Canada Marine Response Corporation. 2013. A study of fate and behavior of diluted bitumen oils on marine waters; Dilbit Experiments, Gainford, Alberta.

[36] Polaris Applied Sciences, Inc. 2013. A comparison of the properties of diluted bitumen crudes with other oils. https://crrc.unh.edu/sites/crrc.unh.edu/files/comparison_bitumen_other_oils_polaris_2014.pdf

[37] Fingas, M. 2011. Models for water-in-oil emulsion formation. In Oil Spill Science and Technology, Ed. M. Fingas, Elsevier Gulf Professional Publishing, p. 243-274.

2002)[38]. In the Mosbech citation, there is no scientific evidence presented regarding this depth of penetration and by what types of oils and we are uncertain of its origin. Crude oils generally do not penetrate deeply into fine sediments. A Bakken crude may penetrate into sand, mixed sediment, or boulder/riprap bank materials but is not retained effectively by the open pore space. Dilbits are more viscous than Bakken crude and hence would have very limited penetration into sand but could penetrate into pebble and coarser materials (Harper 2015)[39] (CRREL/SLRoss)[40]. Retention would be expected to be greater for dilbit than Bakken, where it penetrates into riverbanks.

Oil layers sometimes become buried by movement of sediment or sand by wind and water, but in our experience penetration of heavier oils to the depth reported would be rare in a riverine environment. A light crude oil such as Bakken would have limited persistence in sediments. Dilbit presents a potential fouling or coating concern in marshes. In a review of the literature on impacts of 32 oil spills or field experiments in marshes, recovery occurred within 1–2 growing seasons for most spills, even in the absence of any treatment[41]. The longest recovery was reported for cold climates combined with heavy pooled oil or oil penetration and intensive treatment. Only several instances in very large crude oil spills have reported ongoing recovery after 10 years. Both types of oil proposed are unlikely to penetrate deeply in fine wetland or marsh sediments.

There should also be discussion in the DEIS of response actions that affect trajectories and estimates of weathering processes. For example, spreading and downriver movement will be affected by containment (secondary, pre-booming). This section also omits any discussion of response actions that affect trajectories and weathering processes. As explained in more detail in Vancouver Energy Spill Response Exercise Report (BergerABAM 2016), in an exercise to determine the adequacy of response action resources, the Applicant was able to locate, allocate, and deploy adequate response equipment and trained personnel in accordance with all application spill planning standards. The results of this exercise to test the adequacy of proper execution of the response actions (along with pre-booming and secondary booming) show that response actions significantly impact oil spill trajectories positively.

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[38] Mosbech, A, ed. 2002. Potential Environmental impacts of oil spills in Greenland. An assessment of information status and research needs. National Environmental Research Institute, Denmark. NERI Technical Report No. 415.

[39] Harper, J.R., Laforest, S., and Sergy, G, 2015. Field Investigations of Intertidal Sediment Permeability Related to Spilled Oil Retention in British Columbia Shorelines. Proceedings of the Thirty-Eighth AMOP Technical Seminar, Vancouver BC. Environment Canada. Ottawa, ON, p. 631-648.

[40] CRREL/SLRoss, 2015. Investigation of the Behaviour of Diluted Bitumen and Heavy Conventional Crude Oil Spills. Final Report prepared for the American Petroleum Institute. 125pp plus appendices.

[41] Michel, J. and N. Rutherford. 2014. Impacts, recovery rates, and treatment options for spilled oil in marshes. Mar Pollut Bull. 2014 May 15;82(1-2):19-25. doi: 10.1016/j.marpolbul.2014.03.030. Epub 2014 Apr 3.

The DEIS indicates "dilbit contains a higher concentration of higher molecular weight hydrocarbons" but does not indicate the relative degree of differences with other oils. The diluted bitumen may not have a greater concentration of high molecular weight hydrocarbons than other heavy crude oils.

Winds may have an effect on slick movement but currents are expected to be the predominant transport mechanism, which is not explicitly stated. Depending on wind speed and direction, there may be a small (approximately 3 percent) vector added to the current transport.

Section 4.6, Responding to an Oil Spill, Fire, or Explosion, page 4-39

This section includes multiple references to "explosions" that should be corrected or refined. As stated in comments to Section 4.5.1.3 above and in the reports prepared by Brendan Wright and BakerRisk, it is important for the DEIS to accurately define the potential scope of a fire or explosion (BakerRisk, 2016[5], Wright, 2016[11]). The DEIS must accurately define the kind of events that can occur in an accident involving crude oil in order to properly judge the necessary safety and emergency response considerations. Importantly, the DEIS should be consistent with standardized emergency response guidance which characterize and prepare for risks based on the accurate characterization of the behavior of flammable liquid such as crude oil.

Section 4.6.3.2, Crude Oil Fire and/or Explosion, paragraph 2

This section of the DEIS should be revised to incorporate the input of the Emergency Response Guidebook (ERG). The U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA), along with equivalent regulators in Canada and Mexico, prepare the ERG. As discussed in the report prepared by Brendan Wright, the ERG provides guidance to first responders during the initial response phase and addresses scenarios that could be present upon an incident involving Hazardous Materials (Wright, 2016[11]).

Additionally, as indicated in comments above, the discussion in this section of flammability of crude oil includes errors and overstatements that must be corrected (BakerRisk, 2016[5], Wright, 2016[11]). It is important for the DEIS to accurately define the potential scope of a fire or explosion based on an accurate understanding of the behavior of crude oil. The characterization of explosions or fires in this section do not reflect the fact that an ignited release of crude would most likely form a pool fire that forms slowly enough that onsite populations have time to evacuate away from the event. (BakerRisk, 2016[5]). Proper emergency response plans should mitigate this hazard to have a negligible impact on populations in and near the facility.

Section 4.6.3.3, Fire Department/Medical Facility Response Preparedness, page 4-45

For over two years, the Applicant has been supportive of a thorough gap analysis to evaluate existing capabilities of the Vancouver Fire Department (VFD) against industry standards for response preparedness to respond to the Vancouver Energy Facility. The Applicant has urged, and continues to urge EFSEC to complete that objective assessment. The consultation with VFD

described in this section appears to fall short of the gap analysis that the Applicant has been urging.

The VFD gap analysis should do more than survey the department. While ongoing interviews with VFD officials is an important component, the analysis should also include coordinated discussions between VFD officials and the Applicant, including the Applicant's Fire Protection Engineer of Record, and other appropriate parties deemed necessary to develop a complete understanding of the proposed Facility design and the VFD operational capabilities. Recommended elements of the analysis should include:

1. Describe existing VFD personnel, training, equipment, and response capabilities, including an evaluation of those existing conditions against industry-standard requirements for fire departments of similar classification to identify the existing, baseline conditions.
2. Identify emergency response and crude oil handling industrial facility standards and regulatory requirements applicable to facilities such as the proposed terminal, including, by way of example, the US DOT Emergency Response Guidebook (ERG), and various relevant portions of the National Fire Protection Association (NFPA) recommended practices and standards. Listed below, for example, are sections of the NFPA that the Applicant believes may be relevant to this review:
    - NFPA 13E, Recommended Practice for Fire Department Operations in Properties Protected by Sprinkler and Standpipe Systems;
    - NFPA 291, Recommended Practice for Fire Flow Testing and Marking of Hydrants;
    - NFPA 297, Guide on Principles and Practices for Communication Systems;
    - NFPA 471, Recommended Practice for Responding to Hazardous Materials Incidents;
    - NFPA 1000, Standard for Fire Service Professional Qualifications Accreditation and Certification Systems;
    - NFPA 1002, Standard for Fire Apparatus Driver/Operator Professional Qualifications;
    - NFPA 1005, Standard for Professional Qualifications for Marine Fire Fighting for Land-Based Fire Fighters;
    - NFPA 1006, Standard for Technical Rescuer Professional Qualifications;
    - NFPA 1026, Standard for Incident Management Personnel Professional Qualifications;
    - NFPA 1031, Standard for Professional Qualifications for Fire Inspector and Plan Examiner;
    - NFPA 350, Guide for Safe Confined Space Entry and Work;
    - NFPA 1081, Standard for Industrial Fire Brigade Member Professional Qualifications;
    - NFPA 1231, Standard on Water Supplies for Suburban and Rural Fire Fighting;
    - NFPA 1404, Standard for Fire Service Respiratory Protection Training;
    - NFPA 1405, Guide for Land-Based Fire Departments That Respond to Marine Vessel Fires; and
    - NFPA 1407, Standard for Training Fire Service Rapid Intervention Crews.

3. Evaluate any gaps between VFD personnel, training, and equipment identified in Item 1 above against the industry standards identified in item 2 above. Any identified gaps then should be evaluated for potential mitigation or shared mitigation.

Notwithstanding the pending gap analysis, the Applicant has on several occasions offered and committed to provide training at no cost for members of the VFD at the nationally recognized Texas A&M Engineering Extension Service's Emergency Training Services Institute on a bi-annual basis. Such training would include crude oil train derailment response, crude oil transshipment response at a marine terminal, industrial rescue, industrial fire suppression, flammable liquids handling and fire suppression, and foam application. Participants would also obtain NFPA 1081 certification.

BNSF also invests in community hazmat training and provides free railroad hazmat response. For example, in 2014 and 2015, BNSF underwrote the travel and training expenses for nearly 256 local first responders from Washington for specialized training conducted at a national training and research center, the Security and Emergency Response Training Center (SERTC) in Pueblo, Colorado. The three-day, hands-on field exercises at SERTC provides 24 hours of specialized training for a crude oil incident.

The Applicant believes that these industry-standard training programs are the appropriate standard for response preparedness training and thus should address the emergency response impacts and mitigation described in the DEIS. The FEIS should complete the more thorough and objective gap assessment measured against these standard industry programs so that any specific information, training, or equipment gaps can be identified and addressed in more specific mitigation for the Facility.

Section 4.6.4.3, Fire Department/Medical Facility Response Preparedness, pages 4-46 to 4-49

The survey methodology described in Section 4.6.4.3 of the DEIS falls short of the informative gap analysis that the Applicant has been urging for some communities along the rail line. Instead it compiles opinions from a small percentage of local responders who participated in the voluntary survey, and it is not clear whether those who responded are along the rail transportation route analyzed in the DEIS. Further, the survey asked questions without any benchmark as to what level of training is expected or required for local fire departments and what level and access to equipment is typical.

For example, all firefighters must have hazardous materials training which includes training on the US DOT Emergency Response Guidebook (ERG). Accordingly, all fire departments along the rail line, including rural fire departments, should have adequate training and awareness to implement the Emergency Response Guidebook guidance for first responders during the initial phase of a hazardous materials transportation incident, including a derailment with fire involving Class 3 flammable liquids. This response, described in Section 128 of the ERG, would include evacuating affected populations to the appropriate distance, along with guidance on carefully combating a fire involving tanks or car/trailer loads, such as by either fighting the fire

from the maximum distance possible or if available using unmanned hose holders, or if deemed necessary even to withdraw from area and let the fire burn (potentially. until additional expertise and resources, or both, arrive to direct any further response, which would likely be directed by the regional emergency services agency or equivalent). Such a hazardous materials incident initial phase response, as guided by the ERG, does not require detailed knowledge of the characteristics of various crude oils, except as those characteristics are identified on the hazardous materials placards including the UN product ID number. In addition, there are National Fire Protection Association (NFPA) recommended practices and standards which address related topics relevant to the emergency response and training of firefighters and fire agencies, such as NFPA 471 Recommended Practice for Responding to Hazardous Materials Incidents, which should be followed by organizations that respond to hazardous materials incidents and by incident commanders responsible for managing hazardous materials incidents. It is unclear from the DEIS whether the local fire departments surveyed lack this minimum training required by regulation and industry standards, or whether there is an additional level of training they believe they should have.

The Applicant has offered and intends to offer additional training to key communities along the rail line, including, for example, Spokane Valley. This training consists of no-cost attendance for members of the fire departments at the nationally recognized Texas A&M Engineering Extension Service's Emergency Training Services Institute on a bi-annual basis. Such training would include crude oil train derailment response, crude oil transshipment response at a marine terminal, industrial rescue, water response, industrial fire suppression, flammable liquids handling and fire suppression, and foam application. Participants would also obtain NFPA 1081 certification.

BNSF also invests in community hazmat training and provides free railroad hazmat response. For example, in 2014 and 2015, BNSF underwrote the travel and training expenses for nearly 256 local first responders from Washington for specialized training conducted at a national training and research center, the Security and Emergency Response Training Center (SERTC) in Pueblo, Colorado. The three-day hands-on field exercises at SERTC provide 24 hours of specialized training for a crude oil incident. BNSF also maintains its own fire response capabilities, including more than 250-trained responders staged across the network, and equipment including its fleet of 28 industrial fire-fighting foam trailers. BNSF also mobilizes local, regional, and national contractors to fight fires, mitigate the incident, remediate the environmental damage, direct traffic, etc.

Given BNSF's fire response capabilities, the local fire department's hazardous materials training, additional training provided by the Applicant and BNSF, and mutual aid agreements with other first responders, it is unclear what additional training or equipment is necessary to appropriately mitigate the risks to communities along the rail lines. The FEIS should complete the more thorough and objective gap assessment of local responders along the rail line, including an assessment of existing baseline conditions (matched against the required training described above), so that any specific information, training, or equipment gaps can be identified

and addressed in more specific mitigation, and in an appropriate shared fashion, if gaps are identified along the rail corridor or the vessel corridor where many other parties already regularly transport flammable and hazardous materials.

Section 4.6.4.3, Fire Department/Medical Facility Response Preparedness, page 4-48

The specific discussion of derailment of unit trains in the quoted section from the PHMSA Commodity Preparedness and Incident Management Reference Sheet is misleading. Many trains are a mile in length, whether they are unit trains pulling all crude oil or a manifest train pulling a variety of railcars and commodities. Thus, the detours and road closures created by a train of that length described in the reference sheet is not an extraordinary risk unique to a crude oil unit train that is one mile long, and could be similar to any train of that length.

Section 4.6.5, Vessel Transportation

Section 4.6.5.1, Crude Oil Spill, pages 4-49 to 4-52

This section and other sections of this chapter do not include a complete discussion of spill response measures, GRP response times, and personnel and contractors available for WCD. This Section and other sections do not include a description of the adequacy of spill response measures. While Section 4.3 covers the regulatory requirements and aspects of response, the discussion fails to include GRP response times, personnel, contractors or other details clarifying the extensive resources available to the Facility in the event of a spill. The DEIS provides a cursory description of spill prevention and spill intervention measures; however, extensive spill prevention and response resources are available. Facility design, construction, operations, and maintenance all focus on safe operations and reduction of the risks of accidents or emergencies to as low as reasonably practicable.

In the event of a spill, the responsible party (vessel, facility, or rail) activates their approved oil spill contingency plan (the same as a Vessel Response Plan, VRP, for ships or a Facility Response Plan, FRP, for facilities). Agencies at the Federal and State level review the spill contingency plans and provide approval if plans meet regulatory requirements and planning standards are addressed.

In the Northwest Area (defined as the coastal and inland zones of Idaho, Oregon, and Washington), the RRT and Area Planning Committee have joined together to accomplish all planning and preparedness activities and jointly publish the Northwest Area Contingency Plan (NWACP). The NWACP also incorporates the Statewide Master Plan required by the state's OHSSA. The Northwest Area Contingency Plan undergoes regular review and updates. The 2016 version is available on the Internet at: http://www.rrt10nwac.com/nwacp/ .

The NWACP addresses response to both spills of oil and releases of hazardous substances. The NWACP is used in conjunction with the NCP and provides a single coordinated framework for liaison and assistance during an oil spill response depending on the necessary level of federal,

state or local agency involvement. Federal and State agencies coordinate their resources and authorities to achieve a mutually acceptable resolution of pollution incidents. The Washington Department of Ecology (Ecology) is the pre-designated State On-Scene Coordinator in Washington and the Oregon Department of Environmental Quality (ODEQ) is the pre-designated State On-Scene Coordinator in Oregon.

In addition to the main volume, the NWACP is made up of Geographic Response Plans (GRPs). GRPs are the strategic and tactical volumes of the NWACP and are site-specific plans for responding to oil spills in Washington, Oregon and Idaho. The plans are tailored to a specific beach, shore, or water way. Each GRP has two primary objectives, which are to: pre-identify sensitive natural, cultural or significant economic resources; and give responders directions by prioritizing response strategies. The GRPs are developed to identify sensitive areas and resources in a geographic region that would be at risk from a spill in the area and the recommended strategies and tactics to mitigate impacts on those sensitive areas and resources if threatened by a spill. Facility or vessel response plans are required to address spill response priorities and protection strategies for a spill originating at their respective locations.

Given that Facility or Vessel Response Plans must work in context of Area Plans, the GRPs are thus an integral part of the VRPs and FRPs. The strategies identified in a GRP serve as guidelines for responsible parties, federal and state agencies' coordinated efforts and are deployed during an oil spill. Each GRP has several chapters with a variety of information that is useful to responders, both in the initial hours and for longer periods of time if a response is sustained. Responders implement the directions listed in the GRP without delay while the responders also act to contain the oil and recovery it off the surface of the water. Over time, the GRP protection strategies are refined and supplemented based on field assessments and actual deployments (as part of spill response or exercises). The GRPs are available online at: https://fortress.wa.gov/ecy/coastalatlas/storymaps/spills/spills_sm.html

The Oil Spill Contingency Plan (OSCP, Appendix D) applies to all potential spills at the facility, from the hose connection at a vessel receiving oil at the dock, lines across the dock and to secondary containment, and to any discharge within the facility itself (from lines, tanks, or rail cars). As identified in the OSCP, spill response planning contemplates small to worst-case discharges (WCD) as discussed in Scenarios (Section 4.4). The facility WCD is the entire contents of the largest tank to water; i.e., not allowing for containment on land via the impermeable secondary containment around tanks or for tertiary containment from roadway and topography between the tank farm and the river.

The oil spill response equipment required to respond to these scenarios are established within tiered response timeframes, with immediate initial response provided from personnel and equipment at the facility and augmented by resources cascaded to the spill site. Two primary response contractors (PRCs) (Clean Rivers and Marine Spill Response Corp (MSRC)) are under contract to Tesoro and have personnel and equipment to provide spill response services within established timeframes. Additional response support is also provided through Mutual Aid agreement with BNSF and from other Tesoro operations, as required. All of the spill response

resources that are owned, maintained, and operated by the PRCs throughout the Pacific NW (as well as California, Alaska, and British Columbia) are listed in the Western Response Resource List (WWRL), available at http://www.wrrl.us/.

In an analysis of the resources that are available for response to a WCD from the facility, the two contracted PRCs provide the following levels of equipment available at the staging sites for the WCD (Port of Vancouver, Washington; St. Helens, Oregon; and Longview, Washington) upon activation:

HR	EDRC (bbl/day)	Storage (bbl)	Boom (ft)	Responders
2	25,623	1,368	6,200	32
6	111,704	45,523	51,930	271
12	158,616	51,364	135,842	238
24	160,183	91,764	137,990	483
36	189,607	95,764	140,630	516
48	189,607	95,764	140,630	716

Key components of a rapid and efficient response entail:

- Notifications
- Internal and to PRCs
- To water intake users downstream
- To local, State, and Federal entities per OSCP
- Source Control
- Transfers from secondary or tertiary containment to secure temporary storage
- Containment
- Surveillance and tracking
- Intercept berms, bunds, or trenches to minimize oil movement or seepage into the river
- Containment boom on the river (terminal boom for pre-booming, Current-Buster at facility, and PRC boom)
- Recovery
- Skimming and pump operations from containment boom and recovery sites (see GRPs below)
- Temporary storage (skimmers, vacuum trucks, tanks, barges)
- Protection

The PRC resources would be used to implement GRP strategies applicable within the 48-hour planning window (see list in the ICS232 form developed for a WCD planning exercise). The list includes those sites listed in the NWACP GRP October 2015 listing for the Lower Columbia River and is augmented with additional sensitive sites known to the response organization. Culturally sensitive areas that may require protection would be in addition to those listed but are not included in public documents.

As explained in more detail in Vancouver Energy Spill Response Exercise Report (BergerABAM 2016[9]), in an exercise to determine the adequacy of response action resources, the Applicant was able to locate, allocate, and deploy adequate response equipment and trained personnel in accordance with all application spill planning standards. The results of this exercise to test the adequacy of proper execution of the response actions (along with pre-booming and secondary booming) show that environmental impacts would be minimized or avoided to the extent feasible.

Section 4.6.5.2, Crude Oil Fire and/or Explosion, page 4-53, paragraph 1

The discussion of fire or explosion on a vessel does not include any discussion of the probability of that event occurring. The study prepared by DNV GL models the likelihood of an explosion on a vessel, among other events. (DNV GL, 2016[8]). As explained in Section 6.2 of the report, the frequency of a fire or explosion event of any magnitude on a project vessel is over a thousand years while a fire or explosion event that results in any spilling of cargo, discussed in Section 6.2.5, has a frequency of once every 4,000 years. The extreme explosion events described in the DEIS are improbable and remote, especially in the context of the Facility's limited lease and anticipated duration. It should not be characterized as significant.

Section 4.7, Resource-Specific Impacts

The many errors and issues identified above related to fundamental assumptions, data omissions, and flawed methodology, lead to errors in the DEIS' analysis of impacts to each element of the environment described in Section 4.7. Those errors and issues are not repeated in their entirety in the Applicant's comments on Section 4.7. Instead the following sections identify several specific examples and otherwise focus on issues and concerns unique to Section 4.7.

Section 4.7.1, Potential Scenarios for Resource Impact Analysis

In general, the scenarios described in Section 4.7.1 do not acknowledge or consider the likelihood of any of the events and the discussion of safety measures inherent in the design is not considered. For example, the scenario describing the "Large spill at Proposed Facility" assumes that the very large spill is completely contained within the bermed area, yet also assumes that the oil slick will spread 7 RMs. These statements are inconsistent. More generally, and as indicated in the report prepared by BakerRisk, even large spills from tanks and pumps at the facility should be contained by berms or by appropriate sumps if designed to RAGAGEP (BakerRisk, 2016[5]).

Similarly, as stated in introductory comments to Section 4.1, the discussion of flammability of crude oil includes errors and overstatements that must be corrected (BakerRisk, 2016[5], Wright, 2016[11]). It is important for the DEIS to accurately define the potential scope of a fire or explosion based on an accurate understanding of the behavior of crude oil.

Additionally, the discussion of spills from rail cars is without any discussion of probability or likelihood or probable outcomes in light of any of the identified scenarios. It overstates the likely spill from an individual tank car. As explained in the discussion of Section 4.4.2 above, the DEIS assumes that any tank car release results in loss of all its contents. Historical data of releases from non-pressure-type tank cars in accidents (the same classification for crude oil tank cars) shows that only one-third of the cars lost between 80 and 100 percent of the lading while another one-third lost less than 5 percent of the lading[42,43]. Science based risk assessments, like that prepared by Barkan, Saat, Ramos, should consider probability and consequence when compiling risk profiles. (Barkan et al., 2016[7]). Instead the DEIS simply assumes consequences and its conclusions are therefore not supported.

The discussion of spills and events from vessels are similarly flawed. The scenarios make assumptions that spilled oil would spread unimpeded, reaching, for example, 125 river miles, without any consideration of trajectory, weathering, and dilution, or response measures. The GRP and on-water response times confirmed in the Vancouver Energy Spill Response Exercise Report (BergerABAM 2016[9]), would reduce the likelihood of a substantial amount of oil moving downriver. Likewise, the DEIS' failure to accurately analyze oil trajectory negates the impact that weathering and dilution of oil would have on oil spread throughout the vessel corridor. The DEIS consequently makes incorrect assumptions regarding oil trajectory and impact. Moreover, the scenarios do not address the probability of the event or its likely outcome using a risk based approach. The report prepared by DNV GL attached to this letter uses accepted methods and data to generate a thorough risk assessment of vessel traffic (DNV GL, 2016[8]).

Finally, as noted in the comments to Section 3.03 of the DEIS, the four-tier impact rating scheme is flawed, inconsistent with SEPA, and inconsistently applied throughout. The rating scheme is not well defined with respect to the various resource-at-risk categories. The categories "negligible," "minor," "moderate," and "major" should be better defined in terms of anticipated area affected, nature and degree of effects and duration of anticipated effects. There should be supporting evidence and reference to case histories or cited literature for estimated adverse effects as well as the potential range of outcomes. There should be a section devoted to a review of oil spill studies and case histories in rivers, streams and estuaries for the resource categories such as aquatic species, vegetation, wildlife, mammals and others. Reported resource impact magnitude and recovery times for various study organisms in resource categories should be used to better define injury categories.

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[42] Treichel, T.T. (2014). RSI-AAR Tank Car Accident Safety Research for Crude Oil and Ethanol Cars. Presentation in: NTSB Forum - Transportation of Crude Oil and Ethanol, 22-23 April 2014 Washington, DC. http://www.ntsb.gov/news/events/Documents/Panel%201_C_Todd%20Treichel.pdf

[43] Treichel, T.T., Hughes, J.P., Barkan, C.P.L., Sims, R.D., Phillips, E.A., Saat, M.R. (2006). Safety performance of tank cars in accidents: probability of lading loss. Report RA-05-02, RSI-AAR railroad tank car safety research and test project. Association of American Railroads, Washington, D

Section 4.7.2, Earth Resources

Section 4.7.2.1, Proposed Facility

The assessment of crude oil spill impacts from the proposed Facility on earth resources fails to consider the likelihood of the event or give adequate consideration of mitigation measures designed to contain the release.

Additionally, as indicated in comments above, the discussion in this section of flammability and explosions of crude oil includes errors and overstatements that must be corrected (BakerRisk, 2016[5], Wright, 2016[11]). It is important for the DEIS to accurately define the potential scope of a fire or explosion based on an accurate understanding of the behavior of crude oil. As described in the reports prepared by BakerRisk and Brendan Wright, above, the scenarios described are not consistent with how crude oil behaves (BakerRisk, 2016[5], Wright, 2016[11]). The DEIS suggests that if a large explosion were to occur, a localized crater could be created and debris could be ejected beyond facility boundaries. However, it is questionable whether such an event could occur, given the nature of crude oil. (BakerRisk, 2016[5]). If a tank or a release from other facility elements were to ignite, the most likely outcome would be a pool fire that can be controlled. (BakerRisk, 2016[5]). Given that the majority of releases at the site should be contained by dikes with protective barriers between the fire and the bedrock, it is an extremely low probability that the bedrock could be impacted by a fire at the facility. (BakerRisk, 2016[5]).

Section 4.7.2.2, Rail Transportation, Crude Oil Spill and Explosion, page 4-57

The DEIS does not use any accepted methodology for analyzing oil spill impacts on earth resources from rail spills, and instead considers impacts based only on an assumed amount of released oil. The analysis fails to consider the key elements that actually inform such impacts and largely ignores the effectiveness of spill response measures.

Additionally, as indicated in introductory comments to Section 4.1, this impact analysis of spill, fire or explosion from rail transportation does not adequately consider the No Action Alternative. Under the No Action Alternative, other entities will continue to use and likely increase the use of the railway corridor to transport crude oil to meet the current and future demand of West Coast refineries. To the extent that there is a risk of derailment event involving released crude, that risk exists under the No Action Alternative.

Moreover, the purported impact of a crude oil fire or explosion, specifically, on the rail transportation corridor is overstated. There is no support for statement that explosive forces from a crude oil fire are sufficient to impact bedrock and create a potentially "major impact." This ignores the potential likelihood of an event of that magnitude. As previously indicated, the discussion of a tank car fire should be based on an accurate and carefully defined understanding of the behavior of crude oil when ignited (Wright, 2016[11]).

Section 4.7.2.3, Vessel Transportation, Crude Oil Spill, pages 4-57 and 4-58

The assessment of impacts from vessel spills on aquatic resources is based on an amount of oil the DEIS assumes will be released. It does not consider the likelihood of the event or the proximity of the resources. The analysis does not use any methodology to evaluate the potential impact or determine the behavior of spilled oils. Sunken oil in sediments may create a moderate impact to water column and benthic organisms, or have little to no impact, but the toxicity potential of the oil, bioavailability, exposure, duration, animal abundance, and seasonality, among other factors, determine those impacts. The analysis ignores response measures designed to protect resources.

If a spill occurred, a small portion of a spill may deposit in sediments along riverbanks or in river bedload. However, as noted DEIS comments to Section 4.5.4, such deposits are unlikely to have more than a minimal impact given the types of crude oil the facility plans to receive, and the oil spill and response capabilities of the facility.

The section states that tarballs could form if dense crude oil is left to significantly weather, and sink to the bottom of the river. However, the likelihood of oil submergence or sinking tarballs is low, and if it did occur, would be the result of an extremely unlikely series of events. In order for tarballs to form, it would require a major oil spill with ineffective or failed spill response such that the spilled oil would be left to weather "highly" and mix with river sediment sufficient to cause sinking. Given the low likelihood of such a spill event, combined with the substantial spill prevention design elements of the project (including pre-booming and response booming), and spill response capabilities (Vancouver Energy Spill Response Exercise Report [BergerABAM 2016[9]]), such an impact is unlikely.

Section 4.7.3, Air Quality

Section 4.7.3.1, Proposed Facility, pages 4-58 to 4-59

The DEIS incorrectly concludes that there would be short-term moderate air quality impacts from a larger crude oil spill at the Facility and that an odor impact would minor to moderate. This section fails to consider extremely low probability of the event that would be needed to create the identified impacts of concern. As discussed in the reports prepared by Brendan Wright and BakerRisk, the likelihood of the spill event or explosion is extremely low, already (BakerRisk, 2016[5], Wright, 2016[11]).

Additionally, assessing the air quality or odor implications of a spill at the facility is conjecture without defining the spill volume, crude characteristics, duration and location of the event and the attendant meteorological conditions. The discussion of an oil spill at the facility in Section 4.7.3.1 fails to identify emissions or off-site concentrations or exposure, so there is no basis for characterizing the impact. If the author is suggesting there is a health impact, a nuisance impact, or an aesthetic impact, documentation of that determination should be presented. Lacking that documentation, the risk characterization is arbitrary and groundless. Failure to take into

account scientifically based reasonable scenarios as well as mitigating circumstances severely limits the effective characterization of impact. For example, mitigation measures, including evacuations, are intended to mitigate for that exposure impact and should be recognized in the EIS.

Section 4.7.3.1, Proposed Facility, Crude Oil Spills, page 4-58, paragraph 4

The DEIS incorrectly suggests evaporation of volatile components of spilled crude oil could contribute to ozone formation that would not likely violate NAAQS but could result in a minor contribution to greenhouse gases. Ozone formation is a complicated process that depends on meteorological conditions and atmospheric chemistry. While it is possible a sudden localized increase in VOC emissions from a crude oil spill could contribute to ozone formation, the spill would have to occur when the proper ratio of atmospheric NOx and VOC concentrations is present and in the presence of sunlight. Furthermore, even if these conditions are met, the incremental ozone formation attributable to additional VOC is likely to occur a considerable distance from the spill and is unlikely to be measurable.

Accordingly, the DEIS should note the multiple requirements for ozone formation, the low potential for a measurable increase in ozone concentrations, and acknowledge that the formation unlikely to occur near the facility - if at all.

Section 4.7.3.1, Proposed Facility, Crude Oil Spills, paragraph 5

The DEIS states BTEX and PAHs are classified as hazardous air pollutants (HAPS), which cause serious health effects, or adverse environmental and ecological effects (EPA, 2013). The DEIS should note that the adverse effects depend on exposure (concentration and duration) and in some cases requires an extended exposure period at significant concentrations in ambient air. The source of these compounds is not limited to crude oil. Moreover, the presence of such compounds in crude oil is not sufficient to establish that an oil spill of any particular quantity will result in exposures to nearby populations that result in serious adverse effects.

Section 4.7.3.1, Proposed Facility, Crude Oil Fire or Explosion, page 4-59

The DEIS incorrectly states that "It is anticipated that a large crude oil fire or explosion could directly cause a short-term violation of one or more particulate matter NAAQS from an estimated few hundred meters to up to 2 miles downwind of the fire (National Institute of Standards and Technology 1997, API 2004). " Similarly, the DEIS states that emissions from oil combustion and response equipment would likely create "a localized short-term NAAQS exceedance." Ultimately, the section incorrectly conclude that these impacts from a "small fire at the proposed Facility would be minor to moderate and from a large explosion and fire would be moderate to major."

This analysis of the events, especially the "large explosion and fire" does not adequately consider the very low likelihood of the identified event or otherwise sufficiently characterize the nature of the event to be able to support the conclusions.

Moreover, the API study and the NIST study do not support the conclusions in the DEIS. The NIST study cited in support presents a methodology for predicting smoke plume trajectories with *in situ* burning in complex terrain (mountainous areas). Ignoring differences between *in situ* burning and crude oil fires or explosions, the study does not compare model predictions with the 24-hour NAAQS. Rather, it applies the 24-hour average exposure criteria to a one-hour period to conservatively characterize exposure for short-term periods. The API study addresses a range of environmental and public health issues related to *in situ* burning of crude oil but never supports the statement that emissions from oil combustion and response equipment would likely create "a localized short-term NAAQS exceedance."

It is critical to recognize that meteorological conditions vary over a 24-hour period so modeled impacts for a one hour period are not reflective of impacts for a 24-hour period. Secondly, the PM emissions from a fire will vary with time and the fire is unlikely to last 24 hours. Finally, the 24-hour PM10 and PM2.5 NAAQS are based on statistical measures and measured or predicted values are averaged over a three-year period to determine compliance; it is very unlikely that a single event would cause a NAAQS violation.

Neither the API study, the NIST study, nor the DEIS provide documentation supporting the characterization of air quality impacts of an undefined fire or explosion as a moderate or major impact. We note that the DEIS describes a major impact as of "high intensity and/or of long-term or permanent duration, of localized or regional extent, and/or that affect culturally important, ecologically important, or unique/rare resources." The DEIS discussion of air quality impacts does not support characterizing air quality impacts as major.

Section 4.7.3.1 fails to identify emissions or concentrations or exposure, so there is no basis for claiming emissions from a crude oil fire or explosion would cause a violation of the NAAQS. Lacking that documentation, the risk characterization as major or even moderate is groundless.

Section 4.7.3.1, Proposed Facility, Crude Oil Fire or Explosion, page 4-59

The DEIS incorrectly states that SO2 and NOx emissions from oil combustion and response equipment would create acid rain resulting in minor to moderate impacts from acid rain. Acid rain is a genuine concern in the eastern United States at locations downwind of multiple power plants combusting high sulfur coal. The EPA and state agencies have made significant progress in reducing the pollutants that lead to acid rain. It is not technically sound to state that a single incident of oil combustion will produce acid rain resulting in minor to moderate impacts. Using logic such as this, a single high fat content meal would lead to minor to moderate heart disease. In both cases, the adverse effect is associated only with chronic, long-term exposure.

The DEIS and the cited references do not support the characterization of air quality impacts of an undefined fire or explosion as a moderate or major impact. We note that the DEIS describes a major impact as of "high intensity and/or of long-term or permanent duration, of localized or regional extent, and/or that affect culturally important, ecologically important, or unique/rare resources." The DEIS discussion of air quality impacts from a fire or explosion does not support characterizing air quality impacts as major.

Section 4.7.3.1 fails to identify emissions or concentrations or exposure, so there is no basis for claiming emissions from a crude oil fire or explosion would cause acid rain impacts. Lacking that documentation, the risk characterization as major or even moderate is groundless.

Section 4.7.3.2, Rail Transportation, and Section 4.7.3.3, Vessel Transportation, pages 4-59 and 4-60

These sections indicate the air quality implications of a crude oil spill, fire or explosion along a rail or vessel route would be "similar" to those identified for the proposed facility, and that the impacts could be major depending on the location of the event. Neither section includes any discussion of what type of air emission event could occur along the rail or vessel route, nor any discussion of receptors or how emissions could dissipate.

The characterization of the impact as major (or even moderate) is not supported by any analysis of the event being assessed, and the methodology and analysis that justify characterization as a moderate or major air quality impact is not included. Instead, the DEIS just assumes a major impact. Assessing air quality or odor implications of a spill at the facility is speculation without defining the spill volume, crude characteristics, duration, location and the meteorological conditions. However, depending upon the location, nature and duration of the event, impacts could be non-existent or minor, especially in a small or medium event, or considering an event location where any emissions are likely to dissipate before reaching sensitive receptors, or safety and response measures are sufficient to reduce or eliminate environmental or human health impact.

Finally, as indicated in introductory comments to Section 4.1, this impact analysis of spill, fire or explosion from rail transportation does not adequately consider the No Action Alternative. Under the No Action Alternative, other entities will continue to use and likely increase the use of the railway corridor to transport crude oil to meet the current and future demand of West Coast refineries. To the extent that there is a risk of derailment event involving released crude, that risk exists under the No Action Alternative.

The Final EIS should correct the analysis and delete the second sentence of Sections 4.7.3.2 and 4.7.3.3.

Section 4.7.4, Water Resources

Section 4.7.4.1, Proposed Facility, Crude Oil Spill, pages 4-60 to 4-62

The DEIS discussion of purported impacts from facility spills on surface water, groundwater, water supply, wetlands and floodplains is in error. In all instances described in Section 4.7.4.1, the DEIS analysis and conclusions regarding potential magnitude of the impacts from various size spills at the Facility do not fully account for spill containment, do not recognize spill response plans and resources, and fail to recognize the low likelihood of an incident, particularly spills of a larger magnitude. Thus, conclusions regarding the impact are overstated.

The Analysis Does not Consider Containment

The DEIS nominally recognizes the containment in its analysis of the impacts of spills on the various resources in this section, but then ignores the impact of that containment. For example, the DEIS states that impacts to surface water quality from small to medium spills at the proposed Facility would depend on the location of the spill and the presence or absence of secondary containment. However secondary containment is provided and the DEIS earlier acknowledges that the largest potential spill identified at the proposed Facility would be located within the bermed and lined secondary containment area surrounding the storage tanks. The secondary containment area would be capable of containing 110 percent of the API Standard 650 maximum capacity of the largest storage tank, plus precipitation from a 24-hour, 100-year storm event. Thus, this statement of major impact "depending on containment" is incorrect. There will be containment. The already low likelihood of a release from the facility also escaping a berm or occur near the water would be even more remote. Proper design, construction, and maintenance of tanks, berms, and sumps will result in an extremely low probability of a facility release impacting the Columbia River. It is not appropriate to identify an impact, based on a scenario (no containment) that is incorrect and ignores the proposed design of the Facility. The DEIS should clarify that, because of the extensive spill prevention and containment measures implemented in the site design in this area, even the largest possible spill is unlikely to have even a minor impact on groundwater quality.

The Analysis Does Not Consider Response Measures

The impact analysis also ignores the effectiveness of spill response measures that are further described in comments to Section 4.3. This omission is significant. These spill response measures are known to be effective. In an exercise to determine the adequacy of response action resources, the Applicant was able to locate, allocate, and deploy adequate response equipment and trained personnel in accordance with all application spill planning standards. (Vancouver Energy Spill Response Exercise Report [BergerABAM 2016[9]]). The results of this exercise to test the adequacy of proper execution of the response actions (along with pre-booming and secondary booming) show that a spill would have minimal impact on aquatic resources other than in the immediate spill area of the facility. The failure to consider these measures and

design elements, as well as the failure to consider the likelihood of any of these events occurring violates SEPA.

The Analysis Does Not Consider the Proximity of the Resource of the Ability of a Release to Reach the Resource

The specific purported impacts to groundwater are based on flawed assumptions about potential for groundwater contamination, generally, or ground improvements creating pathways for groundwater improvements. These concerns are misguided, as described in comments to Section 3.3.1.

The wetlands and surface water analysis is also inaccurate because it does not fully consider the proximity of the facility to wetlands, including the mitigation bank in the proximity of the Facility, and surface water. Because the Facility includes secondary containment designed to prevent crude oil from leaving the area it is extremely unlikely that crude oil spills would reach these habitats. Other portions of the facility are located at a greater distance and downslope from these resources, making it extremely unlikely for crude oil to impact them.

While the mitigation bank wetlands are hydrologically connected to the Columbia River via the Vancouver Lake Flushing Channel, a spill that reaches the Columbia River would not reach those wetlands via the flushing channel. Specifically, the Vancouver Lake Flushing Channel is equipped with tidal gates to control flows and could be closed to block the flow of water and oil from a flooding event back into the lake and adjacent wetlands, further protecting them in the unlikely event of an oil spill. As confirmed in the recent internal assessment of spill response actions and capabilities, aquatic spill response equipment could also be deployed at the flushing channel to further reducing the risk of crude oil spills reaching wetlands adjacent to Vancouver Lake during a flooding event.

Even in the event of a WCD in any of the scenarios, any oil that is released will not reach wetlands. The analysis indicates that the WCD cannot reach the wetlands north of Old Lower River Road or the wetland located east of the Storage Tanks because of the site configuration, topography and the size of the WCD. As a preliminary matter, and as described in comments to Section 4.4, above, the WCD is not based on a proper risk methodology, does not represent a probable scenario and should not form the basis of a "significant" impact. Nevertheless, assuming this amount of spill, the oil will not reach wetlands.

Given the topography of the site, the site design and configuration, and the size of the WCD associated with rail unloading transfer pipelines, it is highly unlikely to impossible for the WCD to reach the wetlands north of Lower River Road. The WCD identified in the DEIS associated with the rail unloading transfer pipelines is equal to approximately 13,800 cubic feet of crude oil being released. The closest point between the facility and the wetland is approximately 1,270 feet. The elevation at the rail unloading building (top of rail) is 31 feet 10 inches. The average elevation of Old Lower River Road is elevated above the existing road between 37 and

40 feet in the area of the rail unloading building closest point at Area 200 to the wetlands. The topography in this area is generally flat in the area of the rail corridor and immediately south of the rail corridor gently slopes to the south. The spilled crude oil would accumulate in a shallow pool generally south of the rail corridor and would slowly migrate above ground to the existing storm drainage system located within Terminal 5. Even assuming the WCD only occupied the area north of the railroad tracks between NGL Supply Co. Ltd and the CPU Generating Station (approximately 122,740 square feet) the resulting WCD would pool to a depth of less than 1.5 inches and would not reach the elevation of 37 feet to be able to flow to the north and would not impact existing wetlands, including the wetland mitigation bank. Given the topography in the area, it appears oil cannot reach the wetland under the WCD scenario. Considering a WCD would slowly migrate south away from the wetlands and would not accumulate to a depth capable of overtopping Old Lower River Road there is a negligible risk to the wetlands north of Old Lower River Road from a WCD release near the rail unloading building.

The WCD associated with marine transfer pipeline is equal to approximately 31,650 cubic feet of crude oil. The closest point between the transfer pipeline and the wetland north of Lower River Road is approximately 690 feet. The vertical elevation at the point at which the transfer pipeline enters the storage area containment berm is 27.5 feet[44]; and the elevation of Lower River Road is approximately 32.00 feet[45]. The topography in the point at which the transfer pipeline enters the containment berm is gradually sloping to the south. In the unlikely event that a WCD occurs at the nearest point from the transfer pipeline at the storage tanks and the wetland, the spilled crude oil would accumulate in a shallow pool generally between the south side of the storage tanks and the rail corridor, and would slowly migrate above ground to the existing storm drainage system located within the rail corridor. Even assuming the WCD was confined only to the area between Farwest Steel property line and the containment berm south of Lower River Road and north of the point at which the transfer pipeline enters the containment area (approximately 61,400 square feet[45]) the resulting WCD would pool to a depth less than 6.5 inches. Considering a WCD would slowly migrate south away from the wetlands and would not accumulate to a depth capable of overtopping Old Lower River Road and therefore there is no risk to existing wetlands, including the wetland mitigation bank, from a WCD spill. There is a negligible risk to the wetlands north of Old Lower River Road from a WCD occurring immediately outside of the containment areas at the storage area.

The topography along the transfer pipelines generally slopes towards the south. A WCD occurring at any point along the transfer pipeline areas would pool and sheet flow to downstream storm drainage infrastructure located at the Port's Terminal 4 and Terminal 5; and at the facilities Marine Terminal. Both Terminal 4 and Terminal 5 stormwater systems could be plugged upstream of the outfalls to contain a WCD. Additionally the swales located at the Marine Terminal would contain spilled crude oil before a release to the Columbia River would

[44] Vancouver Energy Draft National Pollutant Discharge Elimination System Permit Engineering Report, February 2015.

[45] Clark GIS, 2015 contour data accessed 12/18/2015

occur. On-site aquatic spill response measures stored at the Marine Terminal area could also be rapidly deployed further reducing the risk of a WCD reaching the Columbia River.

Finally, a spill would not reach the wetlands, because of the extensive spill prevention and response measures available to the facility. Booming is available at the terminal, both for pre-booming operations during transfers and for emergency spill response, providing additional lines of defense for protecting sensitive areas and wetlands. In addition, GRPs in the immediate downstream vicinity of the terminal include measures that would prevent oil from reaching the wetlands include exclusion booming at Hayden Island for Columbia Slough, and notification for pump shutdown, gate closure, and exclusion plus collection booming to prevent oil reaching the Vancouver Lake Flushing Channel. Therefore, the DEIS' statement that "a large spill, particularly a spill from the rail unloading transfer pipeline, could spread into these wetlands" is simply without basis.

The FEIS should revise the analyses of impacts to these identified resources from a spill from the Facility based on the additional analysis provided. Descriptions in Section 4.7.4.1 of possible impacts to resources resulting from spills of crude oil at the facility from the transfer pipelines, specifically in Areas 200, 300, and the connected portions of Area 500, should be modified to reduce the risk of a transfer piping WCD to negligible as it is nearly impossible for a WCD from the transfer pipelines to reach the adjacent wetlands and aquatic environments. Additionally, WCDs from the transfer pipelines similarly could not reach the Fruit Valley Neighborhood located across Lower River Road.

Section 4.7.4.1, Proposed Facility, Crude Oil Fire or Explosion, pages 4-62 to 4-63

This analysis of impacts from a crude oil fire or explosion at the facility does not adequately consider the low likelihood of an incident. As indicated in introductory comments to Section 4.1 of the DEIS, the probability of the risk is an essential component of the determination of whether an impact is significant.

The discussion in this section of flammability of crude oil includes errors and overstatements that must be corrected (BakerRisk, 2016[5], Wright, 2016[11]). It is important for the DEIS to accurately define the potential scope of a fire or explosion based on an accurate understanding of the behavior of crude oil. Statements regarding "large explosion or fire event" and "explosion debris field" are not supported by analysis. Fires would be contained by secondary containment within the facility and blast hazards are extremely unlikely due to the nature of crude oil and the lack of ignition sources for this type of installation. (BakerRisk, 2016[5]).

Additionally, the DEIS discussion regarding potential impacts from the use of fire retardant foam chemicals on groundwater, and potentially on water supply if contaminated surface water entered the unconfined aquifer and then entered local water supply well, does not account for the fact that the Applicant has made a commitment to use a self-healing biodegradable foam (Solberg self-healing biodegradable foam) for firefighting at the facility. The FEIS should use the

correct foam assumptions and correspondingly revise statements regarding potential adverse impacts to surface and groundwater quality from other suppression foams that will not be used at the Facility.

The Applicant provided EFSEC with the Fire System Operation Description for the Facility (Poole Fire Protection 2014[46]) as part of Data Request Letter 3, which was submitted to EFSEC on February 26, 2014 (Makarow 2015[47]). Section 6.1.1 of the Fire System Operation Description for the Facility describes the use of foam fire suppression agents and documents, and documents that "the raw materials used in the Solberg self-healing biodegradable foam have been evaluated to the HCNOF [Harmonized Offshore Chemical Notification Format] and is the only foam to date that has gone through this evaluation. This evaluation, which determines the impact of products discharged into marine and freshwater environments, concluded that the Solberg self-healing biodegradable foam is acceptable for use in the North Sea and in areas that discharge into the North Sea. As well, the German Institute of Hygiene has found the Solberg self-healing biodegradable foam to be of low impact upon discharge to the environment. It should be noted that fluorinated foam products will not achieve those listings because of the persistence of the fluorine molecule. For example, Solberg self-healing biodegradable foam is permitted by the Norwegian Government to allow runoff directly into the Fiords of the North Sea. This is not permitted with fluorinated surfactant based foam products".

The DEIS should revise the analyses of impacts to water resources to address the Applicant's commitment to the use of Solberg self-healing biodegradable foam for firefighting at the Facility.

Section 4.7.4.1, Proposed Facility, Crude Oil Fire or Explosion, page 4-62, paragraph 5, and page 4-63, paragraph 1

The analysis in the DEIS regarding replacement of native vegetation species with nonnative or invasive species following a fire is in error because it is based on a series of improbable events, does not take into consideration the behavior of crude oil and does not take into consideration fire suppression capabilities. Moreover, it does not fully account for the ability of existing native vegetation to revegetate the disturbed wetland, minimizing the disturbance impact. Fire is natural disturbance that occurs frequently within the environment. Depending on the intensity and duration of the fire, the existing seed bank and root structure of burned plants have the ability to repopulate the disturbed area starting immediately or within the next growing season depending on the time of year of the event. While it is true that non-native and invasive species are adapted to colonizing disturbed areas and the presence of a fire presents an opportunity for non-native and/or invasive species to colonize the disturbed area, there also needs to be a

[46] Poole Fire Protection. 2014. Fire System Operation Description. Vancouver Energy. Vancouver Washington. Submitted: February 26, 2014.

[47] Makarow, Irina. 2015. Letter to Stephen Posner, Energy Facility Site Evaluation Council. Vancouver Energy – EFSEC Application No. 2013-01, Docket No. EF131590, Response to EFSEC Draft EIS Data Request 3. February 26, 2015.

nearby seed source or vector for seeds to reach the disturbed area. Therefore, impacts to native vegetation destroyed by a fire would be negligible to minor.

The FEIS should revise the analyses of impacts to wetlands and other water resources from explosion and fire based on the additional analysis provided.

Section 4.7.4.2, Rail Transportation, Crude Oil Spill and Explosion, pages 4-63 to 4-65

This analysis of impacts from a crude oil release or a fire along the rail corridor does not adequately consider the low likelihood of an incident. As indicated in introductory comments to Section 4.1 of the DEIS, the probability of the risk is an essential component of the determination of whether an impact is significant. Here, the type of rail event that could result in spills to water are improbable and do not rise to the level of significance. The analysis does not consider the likelihood of the "large spills" occurring that would lead to the purported "major" impacts. In fact, as noted earlier, it is not typical for a tank car to release all its contents in a train accident. Historical data of releases from non-pressure-type tank cars in accidents (the same classification for crude oil tank cars) shows that only one third of the cars lost between 80 to 100 percent of the lading while another one third lost less than 5 percent of the lading.

Similarly, the discussion in this section of flammability of crude oil includes errors and overstatements that must be corrected (BakerRisk, 2016[5], Wright, 2016[11]). It is important for the DEIS to accurately define the potential scope of a fire or explosion or spill based on an accurate understanding of the behavior of crude oil. The rail "explosion scenario" is highly improbable given the nature of crude oil. For example, it is not plausible that enough debris could be expelled from an explosion to meaningfully alter floodways.

The likelihood of a large rail spill affecting significant portions of the assessed mile-wide rail corridor or reaching water would be lower since oil on land moves slowly and without the aid of wind or water currents. A rail spill is likely to affect a smaller area and fewer resources than a similarly sized vessel spill since it is more likely to occur on land. Impacts from rail spills in are not likely to be "major." Conclusions of major surface water impacts from rail relative to vessels are not warranted.

Additionally, the analysis makes no effort to quantify or study the likelihood that an already improbable event will occur in proximity to any of these resources, whether surface water diversions, groundwater aquifers, wetlands or floodplains. Instead the DEIS simply assumes a risk that is "major" because it assumes it is possible. The likelihood of a large rail spill or explosion event affecting significant portions of the assessed mile-wide rail corridor or reaching surface water or groundwater, water supplies, or wetlands or floodplains would be even lower than the likelihood of the improbable large spill events. Thus, the conclusions are not supported by analysis. Indeed, the analysis prepared by Barkan, Saat and Ramos quantifies the probability that a derailment event will occur at any given mile of the track. (Barkan et al., 2016[7]). This very low probability event does not rise to the level of significance.

Additionally, the analysis does not fully account for spill response plans and resources as discussed previously in comments to Section 4.3, above, including GRPs and response equipment caches. The DEIS should be revised to consider response measures and the specific statement regarding aquifer impact should be removed.

The analysis of the impacts to each of the resources described in this section suffers from these flaws. For example, the characterization in the DEIS of potential impact to aquifers in remote areas is an overstatement, because it assumes the spill would occur within the vicinity of the resource and would not be completely cleaned up and that crude oil would migrate below the surface into aquifers. There is no support for the statement that incident response times would be "delayed" or that clean up would be "incomplete," DEIS at 4-64, such that spills could contaminate aquifers. Similarly, the likelihood of a spill in the immediate vicinity of a wetland or floodplain within the corridor is low, and impacts would be temporary at most, given the limited size of potential oil releases from rail based on the number of rail cars involved, spill response measures, and recovery.

As indicated in introductory comments to Section 4.1, this impact analysis of spill, fire or explosion from rail transportation does not adequately consider the No Action Alternative. Under the No Action Alternative, other entities will continue to use and likely increase the use of the railway corridor to transport crude oil to meet the current and future demand of West Coast refineries. To the extent that there is a risk of derailment event involving released crude, that risk exists under the No Action Alternative.

In addition to corrections to address these issues, the following specific changes are required:

- On page 4-64, the text as drafted suggests that the rail corridor crosses 43 groundwater source protection areas in Oregon. The rail corridor is in Washington, not Oregon. This reference should be removed.
- Page 4-66. Please clarify that the potential spill dispersion modelling shows 2 RMs <u>downstream</u>, not upstream. Sentence before in same paragraph refers to potential for contamination to migrate upstream, thus there is potential for confusion.

The FEIS should revise the analyses of impacts to surface water quality from a spill within the rail corridor, based on the additional analysis provided.

Section 4.7.4.3, Vessel Transportation, Crude Oil Spill, page 4-66, paragraph 5

In general, the methodology in the DEIS related to vessel spill risk analysis is flawed. The large spill volumes that will purportedly create "major" impacts are improbable and not based on risk analysis. See comments on Section 4.4. As a result, the DEIS erroneously identifies as "significant" those risks that are, by its own analysis, remote. As noted in introductory comments to Section 4.1 of the DEIS, likelihood of an event is an important factor when determining whether an impact is significant. DNV GL has prepared a risk- assessment, which

applies commonly accepted methodology and defines the risk without reliance on flawed assumptions of worst-case discharge.

More generally, this analysis does not consider spill response measures in determining the nature of the risk. As discussed in comments to Section 4.6.5, these measures are effective and reduce the risk. An impact assessment of even a large vessel depends on a number of factors, including response measures, which are largely ignored. Large spills on rivers not resulting in major impacts have occurred (M/V Westchester, Mississippi River 2000, M/V Eagle Otome, Sabine River, Texas).[48]

There are a wide range of potential impacts and some resource categories such as fish, mammals or wetlands may not result in major measurable and observable long-term impacts even from large spills. Wetland impacts from large spills have been reported to range between one to two years to up to 40 years in some cases such as the Gulf War.[49] Impacts to fish in some instances are not anticipated based on limited oil dissolution and bioavailability.[50] In situations where the oil is viscous and may present limited bioavailability and toxicity risk to aquatic species, physical fouling may affect bird and result in losses for a number of years.[51] [52] In the 1984 residual fuel oil spill of approximately 200,000 gallons (1,000 barrels) on the Columbia River, 450 oil birds were treated with over 250 released with an estimated 2-9 times more birds affected that were uncaptured.[53] Some large crude oil spills in rivers have resulted in minimal

[48] Michel, J., C. B. Henry Jr., and S. Thumm. 2002. Shoreline assessment an environmental impacts from the M/T Westchester oil spill in the Mississippi river. Spill Science & Technology Bulletin, Vol. 7, Issues 3-4, Nov. 2002, Pages 155-161.

[49] Michel, J. and N. Rutherford. 2014. Impacts, recovery rates, and treatment options for spilled oil in marshes. Mar Pollut Bull. 2014 May 15;82(1-2):19-25. DOI: 10.1016/j.marpolbul.2014.03.030. Epub 2014 Apr 3.

[6] Helton, Douglas, Donna Lawson, and Martin Mchugh. 1995. Natural Resource Damage Assessment Of The Presidente Rivera Oil Spill, Delaware River 1. International Oil Spill Conference Proceedings 1995.1 (1995): 333-38.

[51] Helton, Douglas, Donna Lawson, and Martin Mchugh. 1995. Natural Resource Damage Assessment Of The Presidente Rivera Oil Spill, Delaware River 1. International Oil Spill Conference Proceedings 1995.1 (1995): 333-38.

[52] Nixon, Z., J. Michel, J. Hoff, D. Forsell, S. Krest, R. Hossler, K. Clark, T. Nichols, and J. Dunn. Estimating Bird Injury from The M/T Athos / Incident. International Oil Spill Conference Proceedings 2008.1 (2008): 995-1001.

[53] Speich, S. M, and S. P. Thompson. 1987. Impacts on waterbirds from the 1984 Columbia river and Whidbey Island, Washington, Oil Spills. Western Birds, 18:109-116, 1987.

impacts to vegetation, fish and wildlife.[54] Mammals such as river otters are also unlikely to be adversely affected unless they come in direct contact with oil.[55]

In the context of potential impacts to wetland resources, we reiterate that the DEIS analysis does not fully account for spill response plans and resources or the low likelihood of an incident. Impacts to wetlands can also vary depending on the level of oiling and response actions. For many crude oil spills, recovery can occur within one to two growing seasons,[56] even in the absence of treatment. In a report of oil spill assessments and field studies, oil spill recovery was longest for spills in cold climate, sheltered setting, thick oil on the marsh surface, light refined products with heavy loading, oils that formed persistent thick residues and intensive treatment. The above conditions are possible for both oils proposed at the facility under certain circumstance, but would not likely be the dominant conditions. Recovery of less than five years is typical for wetlands and marshes in most instances when good response decisions are undertaken.[38] Limited tidal action and the slope of the river banks would also limit exposure to a narrow fringe of riverine vegetation in many instances, opening to wider marshes in the lower estuary.

Section 4.7.4.3, Vessel Transportation, Crude Oil Fire or Explosion, page 4-67 paragraph 4

The discussion in this section of flammability of crude oil includes errors and overstatements that must be corrected (BakerRisk, 2016[5], Wright, 2016[11]). It is important for the DEIS to accurately define the potential scope of a fire or explosion or spill based on an accurate understanding of the behavior of crude oil.

Additionally, the discussion of fire or explosion on a vessel does not include any discussion of the probability of that event occurring. As indicated in comments to Section 4.6.5.2, the study prepared by DNV GL models the likelihood of an explosion on a vessel, among other events, and demonstrates the any fire or explosion scenario is extremely unlikely (DNV GL, 2016[8]).

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[54] Michel, J., C. B. Henry Jr., and S. Thumm. 2002. Shoreline assessment an environmental impacts from the M/T Westchester oil spill in the Mississippi river. Spill Science & Technology Bulletin, Vol. 7, Issues 3-4, Nov. 2002, Pages 155-161.

[55] Harwell, M.A. and Gentile, J.H., 2014. Assessing Risks to Sea Otters and the Exxon Valdez Oil Spill: New Scenarios, Attributable Risk, and Recovery. Human and Ecological Risk Assessment: An International Journal, 20(4), pp.889-916.

[56] Michel, J. and N. Rutherford. 2014. Impacts, recovery rates, and treatment options for spilled oil in marshes. Mar Pollut Bull. 2014 May 15;82(1-2):19-25. doi: 10.1016/j.marpolbul.2014.03.030. Epub 2014 Apr 3.

Section 4.7.5, Terrestrial Vegetation

Section 4.7.5.1, Facility Spill, Fire or Explosion

As stated previously in comments to section, the impacts from potential facility event are overstated, since the nature of the fire or explosion is overstated. The risk analysis considers extremely unlikely events that do not rise to the level of a "significant" impact. As noted in introductory comments to Section 4.1, the likelihood of an event is an important factor when determining whether an impact is significant. The WCD from a facility spill is an extremely unlikely event.

Once again, the majority of spills (already a low occurrence) should be contained by berms and sumps.

Moreover, given the industrial nature of the site and its vicinity, statements in the DEIS regarding aboveground vegetation in close proximity to the event is an overstatement and should be clarified. There is no vegetation in close proximity to the facility. There should be negligible terrestrial vegetation near enough to the facility and it is not a major concern from spills.

With specific respect to facility explosions, the discussion in this section of flammability of crude oil includes errors and overstatements that must be corrected (BakerRisk, 2016[5], Wright, 2016[11]). It is important for the DEIS to accurately define the potential scope of a fire or explosion or spill based on an accurate understanding of the behavior of crude oil.

Section 4.7.5.2, Rail Transportation, pages 4-69 to 4-70

As indicated in introductory comments to Section 4.1, this impact analysis of spill, fire or explosion from rail transportation does not adequately consider the No Action Alternative. Under the No Action Alternative, other entities will continue to use and likely increase the use of the railway corridor to transport crude oil to meet the current and future demand of West Coast refineries. To the extent that there is a risk of derailment event involving released crude, that risk exists under the No Action Alternative.

Additionally, the risk events are improbable and not based on risk analysis. *See* Comments on Section 4.4. As a result, the DEIS erroneously identifies as "significant" those risks that are, by its own analysis, remote. As noted in introductory comments to Section 4.1, likelihood of an event is an important factor when determining whether an impact is significant. The analysis makes no effort to quantify or study the likelihood that an already unlikely event will occur in proximity to terrestrial vegetation. Instead the DEIS simply assumes a risk that is "major" because it assumes it is possible. The likelihood of a large rail spill or explosion event affecting significant portions of the assessed mile-wide rail corridor or reaching terrestrial vegetation would be even lower than the likelihood of the improbable large spill or explosion events. Thus, the conclusions are not supported by analysis. Indeed, the analysis prepared by Barkan, Saat

and Ramos quantifies the probability that a derailment event will occur at any given location of the track. (Barkan et al., 2016[7]). This very low probability event does not rise to the level of significance.

Finally, it is important for the DEIS to accurately define the behavior and characterization of crude oil when transported by rail. The vernacular use of the term "explosion" describes a wide range of events, and, without adequate explanation, the connotations of the phrase "explosion" as used in this section are misleading.

The impact analysis does not take into consideration important analysis and information from BNSF regarding fire suppression equipment as well as data regarding the likelihood of the fire scenarios. Without this analysis or data, the impact analysis and conclusions are not supported.

Section 4.7.5.2, Rail Transportation, page 4-69, paragraph 4

The DEIS states that in-situ burning, if used in a response to an oil spill, could result in damage or destroy vegetation.

The DEIS fails to consider the appropriate response procedures and decisions made by response officials that would lead to the approval of in-situ burning. The Northwest Area Contingency Plan includes a section on in-situ burning (Section 9407) and the procedures response officials have to follow in order to implement in-situ burning as a response. Only vegetation previously affected by the spill would be burned in a controlled and contained manner. The DEIS is misleading in the sense that it implies there would be a new impact to vegetation from burning. The DEIS also does not consider the fact the remediation and response measures are undertaken to mitigate the impacts of a spill in an effort to correct any damage.

The recently released Northwest Area Contingency Plan includes guidance on in-situ burning. The DEIS should be updated to include references to the Northwest Area Contingency Plan (Version 17, released October 2015[57]) that provides guidance for in-situ burning as a response measure. The DEIS needs to consider the control measures and approvals required in order to use in-situ burning as a response tool.

Section 4.7.5.2, Rail Transportation, Crude Oil Spills, page 4-69, paragraph 3

The DEIS incorrectly includes special-status plants that only exist along the Stampede Pass (the return route for empty cars) in the total list of special-status species that could be impacted by a spill. The risk of spill reaching special-status plant species outside the rail bed does not exist on the empty car return route. The list in table 3.4-2 should be revised to eliminate the Stampede Pass special-status species.

[57] Northwest Area Contingency Plan Version 17. Available at http://www.rrt10nwac.com/nwacp/.

Section 4.7.5.2, Rail Transportation, page 4-70, paragraph 2

The discussion in this section of flammability of crude oil includes errors and overstatements that must be corrected (Wright, 2016[11]). It is important for the DEIS to accurately define the potential scope of a fire or explosion or spill based on an accurate understanding of the behavior of crude oil.

Additionally, the analysis makes no effort to quantify or study the likelihood that an already unlikely event will occur in proximity to terrestrial vegetation. Instead the DEIS simply assumes a risk that is "major" because it assumes it is possible. The likelihood of an explosion event affecting significant portions of the assessed mile-wide rail corridor or reaching terrestrial vegetation is simply assumed and unlikely. Thus, the conclusions are not supported by analysis. Indeed, the analysis prepared by Barkan, Saat and Ramos quantifies the probability that a derailment event will occur at any given location along the track. (Barkan et al., 2016[7]). This very low probability event does not rise to the level of significance. This is exacerbated by the fact that the DEIS fails to recognize the low proportion of forest within the entire rail corridor and, therefore, the very low risk of a fire incident in a forested area. While it is generally acknowledged that forest fires that reach the crown can spread, the DEIS does not address the relatively low proportion of forest within the entire rail corridor and the risk of an event occurring within a forested segment. Within Washington, only 8 percent of the rail corridor is forested. (DEIS Tables 3.4-1 and 3.4-3).

Finally, as indicated in introductory comments to Section 4.1, this impact analysis of fire or explosion from rail transportation does not adequately consider the No Action Alternative. Under the No Action Alternative, other entities will continue to use and likely increase the use of the railway corridor to transport crude oil to meet the current and future demand of West Coast refineries. To the extent that there is a risk of derailment event involving released crude, that risk exists under the No Action Alternative.

Section 4.7.5.3, Vessel Transportation, page 4-70, paragraph 3

The DEIS incorrectly concludes "Impacts to terrestrial vegetation from large to very large spills would likely be moderate to major since the spill could spread extensively and affect special-status plants and sensitive vegetation communities, resulting in short- and long-term effects on vegetation communities."

The DEIS assumes that all oil spilled in the water would reach terrestrial vegetation and impact special status species and sensitive vegetation. The DEIS doesn't not consider spill response strategies contained the Northwest Contingency Plan and Geographic Response Plans that are activated in the event of a spill. These strategies include booming to protect specific sensitive resources and cleanup measures to contain oil on the water and collect it. This omission is significant.

Additionally, the analysis does not include an assessment of the likelihood of the event. As noted in introductory comments to Section 4.1, the likelihood of an event is an important factor when determining whether an impact is significant. DNV GL has prepared a risk-assessment, which applies commonly accepted methodology and defines the risk without inappropriate reliance on regulatory worst-case discharge.

Many impacts to terrestrial vegetation are often temporary and recoverable in the short term. as cited previously. Oil is unlikely to reach much of the terrestrial vegetation in the 0.5 mile wide corridor unless in flood conditions. In flood conditions, oil may be spread over large areas in the flood waters and expose terrestrial vegetation as in the Yellowstone River pipeline oil spill in 2011. Major and/or long-term impacts to terrestrial flood plain vegetation have not been reported in that incident.[58] Light crude oil in large accumulations can be acutely toxic to plants if not flushed[59] , however, response actions should be considered in assessments of long-term impact. As with other resource categories, conclusions of terrestrial impact should be based on literature or NRDA conclusions from other incidents.

The DEIS should conclude that with execution of existing spill response plans, impacts to sensitive vegetation and special status species would be minor to moderate.

Section 4.7.6, Terrestrial Wildlife

Section 4.7.6.1, Proposed Facility, page 4-72, paragraph 2

The DEIS states that in the event of a spill outside of secondary containment, crude oil could reach habitats to the north in the Columbia River Wetland Mitigation Bank (CRWMB) and Parcel 1A mitigation, as well as impact habitat in the Columbia River.

In general, the risk analysis of facility spills considers extremely unlikely events that do not rise to the level of a "significant" impact. As noted in introductory comments to Section 4.1, likelihood of an event is an important factor when determining whether an impact is significant. Spills, such as the large spills that the DEIS concludes will create "major" impacts are extremely unlikely events. Spills, including large spills, would be contained in the facility and would constitute a negligible health hazard offsite. As described in the reports prepared by BakerRisk and Brendan Wright, above, the scenarios described are not consistent with how crude oil behaves or accurately characterize the facility risk (BakerRisk, 2016[5], Wright, 2016[11]).

[58] http://www.deq.mt.gov/statesuperfund/silvertipoilspill/default.mcpx

[59] Emerson, R.N. 1983. Oil effects on terrestrial plants and soils: a review. Ontario Ministry of the Environment

Additionally, as noted above, the analysis fails to consider design measures that reduce the risk of spills, including secondary containment.

As indicated in comments to Sections 4.7.4.1, above, facility spills, even those occurring within other portions of the facility where there is no secondary containment (i.e., Areas 200, 400, and 500), are extremely unlikely to reach the wetland mitigation bank, the mitigation site to the east, or the River. They are located at a greater distance and downslope from these resources, making it extremely unlikely for crude oil to impact them. Spills from various parts of the facilities would sheet flow to the south where they would encounter the Terminal 4 and 5 stormwater facilities. Both Terminal 4 and Terminal 5 stormwater systems could be plugged upstream of the outfalls to contain a WCD. Additionally the swales located at Area 400 would contain spilled crude oil before a release to the Columbia River would occur. On-site aquatic spill response measures stored at Area 400 could also be rapidly deployed to contain spills.

- The closest point between Area 200 and the CRWMB is approximately 1,200 feet. Based on local topography (approximately 31 feet elevation at the unloading building) and elevations of Lower River Road north of the Facility (average elevation of 37 feet) a WCD at this location could cover an area of approximately 122,740 square feet at a depth of 1.5 inches. The elevation difference of approximately 6 feet would make it extremely unlikely that a WCD at Area 200 would impact sensitive habitats or wildlife to the north. The resulting pool from a WCD would follow local topography and sheet flow to the south where it would encounter Terminal 5 stormwater systems.
- A WCD from Area 500 could occur approximately 700 feet from the CRWMB where the pipeline enters the Area 300 containment berm. The elevation of the pipeline at this location is 27 feet and the elevation of Lower River Road is 32 feet. Based on the DEIS WCD for transfer piping, the resulting pool would cover approximately 61,400 square feet at a depth of 6.5 inches. Based on the elevation of Lower River Road at this location, it is extremely unlikely that the resulting pool would flow north into the CRWMB. The pool would likely flow south and encounter Terminal 4 stormwater facilities.
- Similarly, this location is on the west side of the Area 300 containment berm, approximately 1,290 feet away from the Parcel 1A mitigation site. The entire containment berm is between the mitigation site and a potential release point, making it extremely unlikely that Parcel 1A mitigation would be impacted by a WCD from transfer piping.

Section 4.7.6, Proposed Facility, Crude Oil Spills, page 4-72, paragraph 5 to 4-73, first partial paragraph

The DEIS generally concludes that response measures taken to clean-up a spill would have additional negative impacts on wildlife or habitats. The DEIS does not taken into consideration the procedures for a response effort. Due consideration to all resources is given by the response team and appropriate agencies in developing and approving the strategy. While temporary impacts are expected to occur from a given response effort, the DEIS fails to acknowledge the overall intent of a response is to mitigate the effects of a spill. The DEIS concludes that are

moderate to major impacts from a crude oil spill. There is no consideration given for the mitigation effect on wildlife or habitat following completion of the response, which is intended to result in an overall minimal impact to wildlife.

The DEIS discloses that the Cowlitz/Clark GRP specifies protection of local resources. The DEIS should further expound on the process in which GRPs are activated and the decision making local responders go through in the protection of resources and subsequent clean-up operations.

The DEIS should disclose that response procedures are intended to mitigate the impacts of a spill and to result in overall minimal impacts to wildlife and habitat. The GRPs generally acknowledge that response activities will have a temporary effect on local resources; however, the ultimate goal is the removal of oil and restoration of the resource.

Section 4.7.6.2, Rail Transportation

First, as indicated in introductory comments to Section 4.1, this impact analysis of spill, fire or explosion from rail transportation does not adequately consider the No Action Alternative. Under the No Action Alternative, other entities will continue to use and likely increase the use of the railway corridor to transport crude oil to meet the current and future demand of West Coast refineries. To the extent that there is a risk of derailment event involving released crude, that risk exists under the No Action Alternative.

The DEIS simply assumes that all oil released in a rail incident would reach and impact wildlife resources. The DEIS does not include supporting analysis for this broad-based conclusion. Additionally, the risk events are improbable and not based on risk analysis. *See* comments on Section 4.4. As a result, the DEIS erroneously identifies as "significant" those risks that are, by its own analysis, remote. As noted in introductory comments to Section 4.1, likelihood of an event is an important factor when determining whether an impact is significant.

As stated in comments above and in the reports prepared by Brendan Wright and BakerRisk, it is important for the DEIS to accurately define the behavior and characterization of crude oil. The vernacular use of the term "explosion" describes a wide range of events, and, without adequate explanation, the connotations of the phrase "explosion" as used in this section are misleading (Wright, 2016[11]).

Section 4.7.6.2, Vessel Transportation, pages 4-75 to 4-76

The DEIS assumes that all oil spilled in the water would reach and impact wildlife resources. The DEIS does not include supporting analysis for this broad-based conclusion. Nor does the DEIS consider spill response strategies contained the Northwest Contingency Plan and Geographic Response Plans that are activated in the event of a spill. These strategies include booming to protect specific sensitive resources and cleanup measures to contain oil on the water and collect it. This omission is significant.

Additionally, the analysis does not include an assessment of the likelihood of the event. As noted introductory comments to Section 4.1, likelihood of an event is an important factor when determining whether an impact is significant. DNV GL has prepared a risk- assessment, which applies commonly accepted methodology and defines the risk without inappropriate reliance on worst case discharge.

This analysis also fails to consider the likelihood of an explosion along the vessel corridor. The probability of a fire or explosion on a vessel and its impact is simply assumed. The study prepared by DNV GL models the likelihood of an explosion on a vessel. As explained in the report, the event is improbable and remote and therefore not significant (see DNV GL, 2016[8]).

Section 4.7.7, Aquatic Species

Section 4.7.7.1, Proposed Facility, Crude Oil Spill, pages 4-76 to 4-79

The DEIS assumes that containment at the Facility fails in small to medium sized spills as well as a WCD. If the possibility of containment failure is remote, this should be stated. Any impacts associated with a spill of any size would also be remote. Containment failure at the facility in a WCD would be very similar to a vessel WCD. The DEIS states that impacts to aquatic species and habitat from small to medium spills at the proposed Facility would be minor to moderate depending on the time of year if the spilled oil were to reach the Columbia River. The DEIS states that impacts to aquatic species and habitats from a large spill would be moderate to major in the event that the spilled oil reached the Columbia River and could spread to aquatic habitats up to 7 RMs downstream from the proposed Facility. Comments below apply to both scenarios.

As with all assessments of impacts, the analysis provided in the DEIS does not fully account for spill response plans and resources or the low likelihood of an incident. The discussion of dispersants and their exacerbated effects is unnecessary in the DEIS as it would not be approved for use in the Columbia River. Response actions that are more harmful than the oil would not be approved as part of an Incident Action Plan prepared by Unified Command (UC), having no net environmental benefit. Not only is it important to recognize the ecological benefit of first responders and GRP readiness, it is also important to recognize the benefit of the Unified Command response throughout an operation until waters and shorelines are deemed clean to the extent practicable. Response actions that are known to promote recovery and do not cause additional harm would be approved by the UC unless public safety is a concern.

Not all aquatic habitats may be exposed or impacted, especially subsurface habitats including Essential Fish Habitat. Throughout the document, statements of certainty should be changed to statements indicating the possibility of exposure or impact. There have been large crude oil spills in rivers with little or no evidence of aquatic habitat or aquatic species injury. A spill of 14,000 barrels of Nigerian crude oil into the Mississippi River in 2000 resulted in shoreline contamination along 35 km of one bank of the river. An estimated 50 percent of the spilled oil was recovered during on-water operations. Impacts to fish and wildlife were reported to be

minimal.[60] A riverine spill in a large river system can be ephemeral in terms of duration of exposure with the continual movement of water through the affected area.

Pre-existing contamination from background sources as opposed to short-term events such as oil spills may present a larger concern for salmonids using the Willamette River and LCR where polycyclic aromatic hydrocarbons (PAHs) in the food chain from background contamination are reported to be a potential source of injury.[61] It is likely that some fish will be exposed in a WCD. In 1984, more than 170,000 gallons of oil (>4,000 bbl) were spilled into the Columbia River. Metabolites of aromatic compounds were found in the bile of white captured 57 miles downstream from the spill were significantly higher than those of sturgeon caught upriver.[62] However, exposure is not always injury and population effects are not always a result. Sublethal impacts to fish have been reported in developing embryos and juveniles. [63] While increases in fish bile PAH metabolites and cytochrome P450 system responses can be sensitive indicators of PAH exposure after an oil spill, there is little unequivocal evidence to suggest a linkage to higher order biological effects[64] . The typical persistence of elevated waterborne concentrations is limited in a river spill with the continual influx of upstream water and comparisons to literature toxicity values and exposure assumptions should be carefully considered.

A number of other benthic aquatic organisms provide impact and recovery understanding. Some species are more resilient than others and many metabolize oil at different rates. The estimates of impacts should be based on likelihood of exposure and reported ranges of adverse effects if exposed. Results of studies suggest that oil in streams and rivers has a relatively short-term negative effect on the benthic community. Effects of a 28,000 bbl crude oil spill on the benthic macroinvertebrate community of the Gasconade River in Missouri found elevated

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[60] Michel, J., C. B. Henry Jr., and S. Thumm. 2002. Shoreline assessment an environmental impacts from the M/T Westchester oil spill in the Mississippi river. Spill Science & Technology Bulletin, Vol. 7, Issues 3-4, Nov. 2002, Pages 155-161

[61] Yanagida, G. K., B. F. Anulacion, J.L. Bolton, D. Boyd, D. P. Lomax, O. P. Olson, S. Y. Sol, M. Willis, G. M. Ylitalo. 2012. Polycyclic aromatic hydrocarbons and risk to threatened and endangered chinook salmon in the lower Columbia river estuary. J. Environmental Contamination and Toxicology, Feb. 2012, Vol. 62, Issue 2, pp. 282-295.

[62] Krahn, M. M., L. J. Kittle Jr., and W. D. MacLeod, Jr. 1986. Evidence for exposure of fish to oil spilled into the Columbia river. J. Marine Environmental Research, Vol. 20, Issue 4, 1986, pp. 291-298.

[63] Incardona, J., Carls M., Holland, L, Linbo T, Baldwin D., Myers, M. Peck, K., Tagel M., Rice S and N. Scholtz 2015. Very low embryonic crude oil cause lasting cardiac effects in salmon and herring. Scientific Reports (5). Article 13499

[64] Lee, R. F. and J. W. Anderson. 2005. Significance of cytochrome P450 system responses and levels of bile fluorescent aromatic compounds in marine wildlife following oil spills. Marine Pollution Bulletin, Vol. 50, Issue 7, July 2005, PP. 705-723.

PAHs and population changes that returned to background conditions rapidly in moving water with backwater areas recovering in an estimated 18 months after the spill.[65]

The DEIS should identify the invertebrates which may be exposed during an oil spill and assess the resiliency of such invertebrates and ability of invertebrates to metabolize oil at different rates. For example, bivalve mollusks do metabolize oil, albeit more slowly than vertebrate organisms. The estimates of impacts should be based on their likelihood of exposure and the estimated adverse effects if exposed. In general, estimates of potential impacts are not often supported by citation and more substantiation from the literature and other past spills would be valuable.

The benthic macroinvertebrate fauna of smaller streams following spills indicate similar results. Monitoring of a small stream in Missouri following a 13,000 bbl domestic crude oil spill indicated widespread initial loss of aquatic insects, crustaceans, segmented worms, roundworms, flatworms, snails, freshwater mussels and other benthic organisms in the oil impacted area but recovered to typical values in approximately 11 months.[66] The most apparent factors controlling the recovery were the total volume of water passing through the contaminated area and the occurrence of scouring flood. In another study in a river in Northern Alberta, Canada, the effect of synthetic crude oil and its major components (naphtha, kerosene and gas/oil) upon the benthic community was tested under circumstances replicating a short catastrophic synthetic crude oil spill and was found to have a negligible effect upon benthic communities in stream riffles.[67]

While a claim of major (long-term and widespread) aquatic effects may be possible, it is not supported with relevant examples and in some instances in the DEIS is overstated.

The FEIS should revise the analyses of impacts to habitat and species from a spill at the Facility, based on the additional analysis provided.

Section 4.7.7.1, Proposed Facility, Crude Oil Fire or Explosion, page 4-79, paragraphs 3 and 4

The DEIS states that impacts to aquatic species and habitat from a large explosion and fire event would likely be minor to moderate as debris could enter the Columbia River and cause short-term, localized degradation of water quality (e.g., water temperature and quality) and species injury or disturbance.

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[65] Poulton, B. C., S. E. Finger, and S. A. Humphrey. 1997. Effects of a crude oil spill on the benthic invertebrate community in the Gasconade River, Missouri. Environmental Contamination and Toxicology, October 1997, Volume 33, Issue 3, pp. 268-276.

[66] Crunkilton, R. L. and R. M. Duchrow. 1990. Impact of a massive crude oil spill on the invertebrate fauna of a Missouri Ozark stream. J. Environmental Pollution, Vol. 63, Issue 1, 1990, PP. 13-31.

[67] Lock, M. A., R. R. Wallace, and D. R. Barton. 1981. The effects of synthetic crude oil on microbial and macroinvertebrate benthic river communities: Part I – Colonisation of synthetic crude oil contaminated substrata. Environmental Pollution Series A, Ecological and Biological, Vol. 24, Issue 3, March 1981, PP. 207-217.

The analysis provided in the DEIS regarding explosion is in error. As described in comments to Section 4.7.1, the discussion in this section of flammability of crude oil includes errors and overstatements that must be corrected (BakerRisk, 2016[5], Wright, 2016[11]). It is important for the DEIS to accurately define the potential scope of a fire or explosion or spill based on an accurate understanding of the behavior of crude oil. The Facility "explosion scenario" is highly improbable given the nature of crude oil. For example, events at a crude oil facility will not have concussive effect along the lines described in the DEIS. The DEIS must accurately define the kind of events that can occur in an accident involving crude oil in order to properly judge the necessary safety and emergency response considerations.

The DEIS should revise the analyses of impacts to aquatic habitats and species from explosion based on the additional analysis provided.

Section 4.7.7.2, Rail Transportation, Crude Oil Spill, page 4-79, paragraphs 5 and 6

The conclusion in the DEIS related to impacts to aquatic species from spills along the rail corridor are in error.

The analysis provided in the DEIS does not fully account for spill response plans and resources, nor the low likelihood of an incident and should be revised.

Additionally, the large to very large spill scenarios are an extremely unlikely event. (Barkan et al., 2016[7]). As noted in introductory comments to Section 4.1, likelihood of an event is an important factor when determining whether an impact is significant. Improbable and remote events like the large to very large spills from rail are not "significant" impacts. This does not also take into consideration the probability that any oil spilled from a rail event would reach water.

Also, as indicated in introductory comments to Section 4.1, this impact analysis of spill, fire or explosion from rail transportation does not adequately consider the No Action Alternative. Under the No Action Alternative, other entities will continue to use and likely increase the use of the railway corridor to transport crude oil to meet the current and future demand of West Coast refineries. To the extent that there is a risk of derailment event involving released crude, that risk exists under the No Action Alternative.

The FEIS should revise the analyses of impacts to habitat and species from a spill at the rail corridor, based on the additional analysis provided.

Section 4.7.7.2, Rail Transportation, Crude Oil Fire or Explosion, page 4-80, paragraphs 1 and 2

First, as indicated in introductory comments to Section 4.1, this impact analysis of spill, fire or explosion from rail transportation does not adequately consider the No Action Alternative. Under the No Action Alternative, other entities will continue to use and likely increase the use

of the railway corridor to transport crude oil to meet the current and future demand of West Coast refineries. To the extent that there is a risk of derailment event involving released crude, that risk exists under the No Action Alternative.

The discussion in this section of flammability of crude oil includes errors and overstatements that must be corrected (BakerRisk, 2016[5], Wright, 2016[11]). It is important for the DEIS to accurately define the potential scope of a fire or explosion or spill based on an accurate understanding of the behavior of crude oil. The rail "explosion scenario" is highly improbable given the nature of crude oil. The DEIS incorrectly concludes that these impacts from fire or explosion have potential for major impact due to contamination of the river, which is a substantial overstatement. Debris or crude oil is not likely to reach the river in a fire or explosion. Thus, impacts or contamination from that debris or crude oil is not expected to occur.

Section 4.7.7.3, Vessel Transportation, Crude Oil Spill, pages 4-81 paragraph 2 and 4-82 paragraph 2

The DEIS concludes that impacts to aquatic habitats and species from small to medium spills along the vessel corridor would likely be moderate to major, and impacts to aquatic habitats from large to very large spills would likely be major.

The analysis provided in the DEIS does not fully account for spill response plans and resources, nor the low likelihood of an incident and should be revised. As indicated in comments to Sections 4.5.3, 4.5.4 and 4.5.5, spill response strategies contained the Northwest contingency Plan and Geographic Response Plans are activated in the event of a spill. These strategies include booming to protect specific sensitive resources and clean-up measures to contain oil on the water and collect it. This omission is significant. As explained in more detail in Attachment 4-5 (Vancouver Energy Spill Response Exercise Report), in an exercise to determine the adequacy of response action resources, the Applicant was able to locate, allocate, and deploy adequate response equipment and trained personnel in accordance with all applicable spill planning standards. The results of this exercise to test the adequacy of proper execution of the response actions (along with pre-booming and secondary booming) show that response actions significantly impact oil spill trajectories positively. The failure to consider these measures and design elements, as well as the failure to consider the likelihood of any of these events occurring violates SEPA.

Additionally, the analysis does not include an assessment of the likelihood of the event. As noted in introductory comments to Section 4.1, the likelihood of an event is an important factor when determining whether an impact is significant. DNV GL has prepared a risk-assessment, which applies commonly accepted methodology and defines the risk without inappropriate reliance on worst-case discharge.

For the reasons stated in the comments on Section 4.7.7.1, the DEIS overstates the potential impacts of a spill on habitat and species.

The FEIS should revise the analyses of impacts to habitat and species from a spill in the vessel corridor, based on the additional analysis provided.

Section 4.7.7.3, Vessel Transportation, page 4-82, paragraph 3

The DEIS states that:

> *…depending on location and extent of the event, a crude oil fire and/or explosion in the vessel corridor could potentially damage shoreline habitat and localized water quality.*

Furthermore, the DEIS states that:

> *…in the event of a large explosion, debris released could degrade water quality and potentially injure aquatic species present in the blast zone. Sound pressure levels resulting from a large explosion could exceed behavioral thresholds and injury thresholds for some aquatic species.*

The DEIS concludes that:

> *Direct impacts to aquatic species from a large explosion and fire event could be minor to moderate depending on species presence, noise, and ejected debris. However, the explosion and fire could result in a small to very large oil spill.*

This analysis fails to consider the likelihood of an explosion along the vessel corridor. The probability of a fire or explosion on a vessel and its impact is simply assumed. As noted in introductory comments to Section 4.1, the likelihood of an event is an important factor when determining whether an impact is significant. DNV GL has prepared a risk- assessment which applies commonly accepted methodology and defines the risk without inappropriate reliance on worst case discharge. As indicated in comments to Section 4.6.5.2, the study prepared by DNV GL models the likelihood of an explosion on a vessel, among other events, and demonstrates the any fire or explosion scenario is improbable and remote (DNV GL, 2016[8]).

The discussion in this section of flammability of crude oil includes errors and overstatements that must be corrected (BakerRisk, 2016[5], Wright, 2016[11]). It is important for the DEIS to accurately define the potential scope of a fire or explosion or spill based on an accurate understanding of the behavior of crude oil.

The analysis provided in the DEIS regarding explosion overstates any potential for impact.

Section 4.7.8, Energy and Natural Resources

The DEIS does not address potential impacts of a spill from rail transportation to Columbia River dams, if a spill occurred in an area where it could enter one of the dam pools. The Applicant's PDEIS, Section 5.14.3.1, addressed this issue as described below. This information regarding spill response planning at the dams should be included in the FEIS:

GRPs take into consideration the location of existing public water intakes and incorporate strategies for booming to avoid impacts to the intakes. BNSF has implemented procedures to provide timely notification of incidents to USACE dam operators. The presence of the dams provides the opportunity to capture spilled materials that float on water. USACE implements specific response capabilities to respond to such events to prevent damage to fish ladders and dam operations. When notified of an incident that has the potential to impact a dam facility, USACE implements its response plans, including diverting materials prior to reaching the dam facilities or associated fish ladders.

This information was sourced from the following reference cited by the DEIS:

Burlington Northern Santa Fe (BNSF) Railway. 2013b. Fallbridge Sub Oil Spill Control Points (CCPs). April 2013.

Additional details are also contained in other documents transmitted to EFSEC in association with the PDEIS, and cited as follows in Chapter 8 of the PDEIS:

BNSF. 2013a. Pacific Northwest Division, Geographic Response Plans (GRPs) and Company Control Points (CCPs). April 2013.

Section 4.7.9, Environmental Health

Section 4.7.9.1, Proposed Facility, Crude Oil Spill, pages 4-84 and 4-85, paragraph 5

At Section at 4.7.9.1 the DEIS states that:

A crude oil spill at the proposed Facility could potentially expose onsite personnel, nearby Port facility personnel, and residents/workers at the Clark County Jail Work Center (JWC) and Fruit Valley neighborhood to released oil and its vapors. Health effects could result from direct exposure to crude oil or crude oil vapor compounds. Workers and spill responders would be at risk for exposure in the event of a crude oil spill.

This statement greatly overstates the likelihood that a crude oil spill could migrate the distance necessary to impact the Fruit Valley neighborhood as discussed in the comment to Section 4.7.1 of the DEIS.

Further, the DEIS states:

If a large spill migrated outside of the proposed Facility boundary, impacts could be minor to moderate since other persons could be affected in the release area and some short-term dermal exposures to crude oil could occur.

In the context of the entire discussion in this section, this sentence implies that the public could incur minor to moderate impacts from crude oil vapors. As a preliminary matter, the DEIS should note that Workers would not be exposed to H_2S inhalation in enclosed spaces for prolonged periods of time. Workers would immediately evacuate any area with 10 ppm or more H_2S.

As indicated in the attached report prepared by BakerRisk, based on other studies of similar facilities, the offsite impacts are overstated. (BakerRisk, 2016[5]). Severe injuries to personnel would not typically be predicted for an unignited release. An unignited release will typically constitute a negligible health hazard to offsite populations.

More generally, the DEIS does not provide substantiation of its conclusion that that public exposure to H_2S vapors in the event of a spill which migrates outside the Facility boundary is likely to occur and likely to have a moderate adverse impact. The DEIS also does not identify that in the event of such a release, response measures to the spill would include excluding the public from areas affected by the spill during the response activities.

The closest source of project-related crude oil to the Fruit Valley neighborhood is the oil stored in storage tanks in Area 300. In order for a crude oil spill to reach the Fruit Valley neighborhood, a major release from the tanks or sections of transfer pipelines associated with Area 300 oil handling operations would have to breach the Area 300 secondary containment berm, and then travel approximately 0.5 mile eastward across natural and developed areas prior to reaching the closest Fruit Valley residence. At Section 4.3.8.3, the DEIS states:

> *The probable route of discharge off the proposed Facility property would follow natural drainage patterns to the south, past existing rail infrastructure, through the Terminal 4 stormwater pond located on Port of Vancouver (Port) property and into the Columbia River.*

Even in the scenario where a major earthquake occurred causing a major release at Area 300, and assuming all of the seismic protection measures to protect the storage and tanks failed the DEIS recognizes that the soils around Area 300 would be susceptible to liquefaction, thereby modifying the topography in a manner that favors surface flow towards the Columbia River, not towards inland locations. Thus, even in the unlikely event of a release, the oil and oil vapors would not be expected to migrate toward the Fruit Valley Neighborhood.

On the issue of H_2S exposure as a result of a crude oil spill that could migrate beyond the Facility boundary, The PDEIS identified scientific literature that concluded that if exposure occurred, it would only be with respect to spill response professionals actively engaged with response activities, as follows: "In an assessment of risk to first responders at sites of inadvertent crude oil releases, modelling of atmospheric emissions of H_2S from crude oil releases to assess risk of first responders at crude oil release sites indicated that, even under worst-case conditions (no wind), modeled concentrations drop to non-toxic levels in less than 4 minutes after oil leaves containment and is exposed to air, assuming no further release of oil

(Thayer and Tell 1999[68]). H_2S exposure is expected to be highest where oil has been spreading for the first 4 minutes immediately after a discharge and immediately adjacent to the discharge. This suggests that exposure to H_2S concentrations could pose health risks in the immediate area of an ongoing release or source to people who were directly interacting with crude oil for extensive periods of time (i.e., spill cleanup professionals)." Further, as part pf the Applicant's Emergency Response Plan and Oil Spill Contingency Plan (DEIS, Appendices D.4 and D.12), local emergency responders would be involved with setting up safety perimeters around the location of the incident in order to exclude the public and avoid their exposure to spilled materials or response activities. Monitoring of the ambient air near a spill is also part of the emergency response. Higher H_2S readings prompt the use of respirators or supplied breathing air for responders.

The discussion in the DEIS regarding impacts of crude oil spills from the Facility to personnel, adjacent facilities or the Fruit Valley neighborhood should be placed in context regarding their probability to occur given the mitigation measures proposed by the Applicant or otherwise required by EFSEC, and the likelihood, or lack thereof, that a spill would reach those locations. The DEIS should incorporate discussion of scientific literature that concludes that exposure of the public to H_2S resulting from a crude oil spill is not a probable significant adverse impact.

Section 4.7.9.1, Proposed Facility, Crude Oil Fire or Explosion, pages 4-85 and 4-86

The discussion in this section of flammability of crude oil includes errors and overstatements that must be corrected (BakerRisk, 2016[5], Wright, 2016[11]). It is important for the DEIS to accurately define the potential scope of a fire or explosion or spill based on an accurate understanding of the behavior of crude oil. The facility "explosion scenario" is highly improbable given the nature of crude oil. For example, it is not plausible that oil ignition could result in a blast wind capable of causing blunt force trauma or debris injuries. This conclusion is unsupported and should be removed. An event of that type is associated with a LPG boiling liquid expanding vapor explosion ("BLEVE") that is simply not feasible with crude oil

More generally, the statements regarding impacts and loss of life are made in the absence of any context. The Applicant firmly believes injuries and fatalities are preventable and no injury or fatality is acceptable. Determining the level of risk that is tolerable from a risk management standpoint should take into consideration both the potential *consequence* of an occurrence and the probability of that occurrence. For example, workers on site will be wearing fire resistant clothing and will be trained to evacuate safely from fires. Therefore, while a fire injuring one person is a possible scenario and the consequence to that individual would not be tolerable, it may more appropriately be labeled a "minor concern" for SEPA purposes because it is a very low frequency event impacting one individual rather than the population as a whole. Risk based decisions are much more fitting for this type of analysis and are more the norm for how humans behave in general. Looking at only the consequences of these events cannot provide a

[68] Thayer, E.C., and J.G. Tell. 1999. Modeled exposures to freshly spilled crude oil. 1999 International Oil Spill Conference. Paper No. 270.

complete decision-making framework. Looking at the frequency of these events would show a very low risk of significant injury to onsite populations or to the public. (BakerRisk, 2016[5]).

Section 4.7.9.2, Rail Transportation, pages 4-87 to 4-91

As indicated in introductory comments to Section 4.1, this impact analysis of spill, fire or explosion from rail transportation does not adequately consider the No Action Alternative. Under the No Action Alternative, other entities will continue to use and likely increase the use of the railway corridor to transport crude oil to meet the current and future demand of West Coast refineries. To the extent that there is a risk of derailment event involving released crude, that risk exists under the No Action Alternative.

Additionally, the analysis relies on the same flawed methodology addressed in comments to Section 3.14. In particular, the analysis does not account for alternative routes of evacuation, if evacuation were necessary to escape fire or exposure to possible air contaminants from a fire. If there is a rail incident that requires evacuation, there is no reason why the evacuation must occur under or across the tracks where the incident is occurring and potentially blocking the evacuation route.

Section 4.7.9.3, Vessel Transportation, page 4-91, paragraphs 2 to 5

In its analysis of vessel spill risks, the DEIS fails to consider spill response strategies contained the Northwest Contingency Plan and Geographic Response Plans that are activated in the event of a spill. These strategies include booming to protect specific sensitive resources and cleanup measures to contain oil on the water and collect it. This omission is significant.

Additionally, the analysis does not include an assessment of the likelihood of the event. As noted in introductory comments to Section 4.1, the likelihood of an event is an important factor when determining whether an impact is significant. DNV GL has prepared a risk-assessment, which applies commonly accepted methodology and defines the risk without inappropriate reliance on regulatory worst-case discharge.

In particular, this analysis fails to consider the likelihood of an explosion along the vessel corridor. The probability of a fire or explosion on a vessel and its impact is simply assumed. As indicated in comments to Section 4.6.5.2, the study prepared by DNV GL models the likelihood of an explosion on a vessel, among other events, and demonstrates the any fire or explosion scenario is extremely unlikely (DNV GL, 2016[8]).

It is not plausible that other river users or people along the shoreline could be at risk of injury or death from an incident onboard a vessel. This conclusion is unsupported and should be removed.

Section 4.7.10, Noise

Section 4.7.10, Proposed Facility, Crude Oil Fire or Explosion from Facility, Rail or Vessel

The discussion in this section of flammability of crude oil includes errors and overstatements that must be corrected (BakerRisk, 2016[5], Wright, 2016[11]). It is important for the DEIS to accurately define the potential scope of a fire or explosion or spill based on an accurate understanding of the behavior of crude oil. . In the unlikely event of a release of crude followed by ignition, the most likely outcome would be a pool fire. Explosions of the kind described are improbable. Thus, ground vibration and auditory injuries (within 1.5 miles) are therefore not plausible as described. Although flammable, crude oil is not "explosive" in nature and would not result in concussive impacts. A fire does not contain the same sound energy as an explosion. Therefore, any noise impacts identified from an explosion are grossly overestimated. This conclusion is unsupported and should be removed.

Furthermore, the calculations conducted for this analysis used an L_{dn} (i.e., a long-term noise descriptor intended for day-long noises) instead of a short-term descriptor and then applied long-term operational noise impact criteria to identify potential impacts. Both the substance and methodology of this assessment are in error.

Section 4.7.11, Land and Shoreline Use

Section 4.7.11.2, Rail Transportation, pages 4-94 to 4-95

The conclusion that a spill or explosion along the rail line could result in moderate to major impacts is not supported by analysis.

Additionally, as indicated in introductory comments to Section 4.1, this impact analysis of spill, fire or explosion from rail transportation does not adequately consider the No Action Alternative. Under the No Action Alternative, other entities will continue to use and likely increase the use of the railway corridor to transport crude oil to meet the current and future demand of West Coast refineries. To the extent that there is a risk of derailment event involving released crude, that risk exists under the No Action Alternative.

Additionally, the analysis makes no effort to quantify or study the likelihood that an already unlikely event will occur in proximity to specific land uses. Instead the DEIS simply assumes a risk that is "major" because it assumes it is possible. The likelihood of a large rail spill or explosion event affecting significant portions of the assessed mile-wide rail corridor or reaching specific land uses would be extremely low. Indeed, the analysis prepared by Barkan, Saat, and Ramos quantifies the probability that a derailment event will occur at any given mile of the track. (Barkan et al., 2016[7]). This very low probability event does not rise to the level of significance.

The discussion in this section of flammability of crude oil includes errors and overstatements that must be corrected (BakerRisk, 2016[5], Wright, 2016[11]). It is important for the DEIS to accurately define the potential scope of a fire or explosion or spill based on an accurate understanding of the behavior of crude oil.

Section 4.7.11.3, Vessel Transportation, page 4-95

The conclusion that a spill or explosion along the vessel corridor could result in moderate to major impacts is not supported by analysis.

The DEIS assumes that oil spilled in the water would reach and impact land uses. The DEIS does not include supporting analysis for this broad-based conclusion. Nor does the DEIS consider spill response strategies contained the Northwest Contingency Plan and Geographic Response Plans that are activated in the event of a spill. These strategies include booming to protect specific sensitive resources and cleanup measures to contain oil on the water and collect it. This omission is significant.

Additionally, the analysis does not include an assessment of the likelihood of the event. As noted in introductory comments to Section 4.1, the likelihood of an event is an important factor when determining whether an impact is significant. DNV GL has prepared a risk-assessment, which applies commonly accepted methodology and defines the risk without inappropriate reliance on regulatory worst-case discharge. The discussion of fire or explosion on a vessel does not include any discussion of the probability of that event occurring. As indicated in comments to Section 4.6.5.2, the study prepared by DNV GL models the likelihood of an explosion on a vessel, among other events, and demonstrates the any fire or explosion scenario is extremely unlikely (DNV GL, 2016[8]).

Section 4.7.12, Visual Resources

Section 4.7.12.1, Proposed Facility, page 4-96 paragraph 3

The DEIS claims that major fire and/or explosion at the proposed Facility would likely produce short-term moderate to major visual impacts that could be observed from considerable distances. In addition, smoke and flames from a large fire event could spread to adjacent areas including the Fruit Valley neighborhood or the Shillapoo Wildlife Area resulting in major visual resource impacts. The likelihood of such an event occurring is remote, its duration temporary, and thus the impact should be considered negligible or minor.

By way of comparison, impacts to visual resources from fire in the landscape has been assessed by federal land managers (Bureau of Land Management[69,70]). The assessment of prescribed fires

[69] Bureau of Land Management, Manual 8431 – Visual Resource Contract Rating, United States Department of the Interior

and fuel reduction projects recognizes that fire will result in short-duration changes in the visual character of landscape. The degree of visual change will depend on several factors including distance of fire event from sensitive viewers (rural, urban, recreation, etc.), character of landscape features (forest, grassland, desert) scale of event, and length of time the event is observable before being extinguished. In addition, climatic conditions including prevailing winds and moisture will affect the character of the fire event and the associated impacts from smoke. Because of these factors, is difficult to quantify the impacts of a potential catastrophic fire before it occurs.

Section 4.7.12.1 of the DEIS should be corrected to indicate that visual impacts crude oil fire or explosion should be considered temporary and minor due to the low likelihood of the event occurring and its limited duration, if it does occur. In addition, facility fires or explosions would most likely be controlled or contained by the fire suppression systems provided for the facility such that that the fire spreading to the Fruit Valley Neighborhood and Shillapoo Wildlife Area is highly unlikely.

Section 4.7.12.2, Rail Transportation, page 4-97, paragraph 1

The DEIS states that spill cleanup activities along the rail corridor could result in moderate impact to visual resources. However, this potential impact should be considered temporary and this paragraph should be revised to note that visual impacts from cleanup activities are short-term and, therefore, should more appropriately be characterized as minor, not moderate.

As stated in DEIS Section 4.7.12.3 for Vessel Transportation, "spill cleanup and recovery operations would create temporary visual impacts." Visual impacts from cleanup and recovery operations for rail transportation should likewise be considered temporary.

DEIS page 4-97, paragraph 1 should be revised to:

> <u>Temporary</u> *impacts to visual resources could also result from response activities, including the presence of vehicles and equipment (including helicopters, if needed). In urban or industrial areas, the presence of additional vehicles or crews from cleanup response would be minor as the presence of vehicles, work crews, and other equipment in these areas is a regular occurrence. In rural and natural areas, while the visual impacts could be considered moderate while they are occurring, they will nonetheless be temporary and thus should more appropriately be considered at most minor.*

[70] Bureau of Land Management, 2011, Environmental Assessment DOI-BLM-CO-N040-2011-0029-EA, Roan Plateau Prescribed Fire and Fuels Reduction Project, United States Department of the Interior

Sections 4.7.12.2, Rail Transportation, Crude Oil Fire or Explosion, and Section 4.7.12.3, Vessel Transportation, Crude Oil Fire or Explosion, page 4-97, paragraphs 1 and 4 (Rail and Vessel Fire)

The DEIS claims that major fire and/or explosion along the rail corridor or vessel route could result in moderate to major visual impacts. The likelihood of such an event occurring is remote and even if it occurred would be temporary and thus the impact should be considered minor. For example, there is no support for assertion that a large fire or explosion along the vessel corridor could impact important buildings or residential neighborhoods, as stated in the DEIS. The probability of a fire or explosion on a vessel and its impact is simply assumed. As indicated in comments to Section 4.6.5.2, the study prepared by DNV GL models the likelihood of an explosion on a vessel, among other events, and demonstrates the any fire or explosion scenario is extremely unlikely (DNV GL, 2016[8]). Similarly, the analysis prepared by Barkan, Saat, and Ramos quantifies the probability that a derailment event will occur at any given location on the rail route. (Barkan et al., 2016[7]). This very low probability event does not rise to the level of significance. This sentence and the associated "major" impact conclusion should be removed because it is unsupported and speculative.

Section 4.7.12 of the DEIS should be corrected to indicate that visual impacts crude oil fire or explosion should be considered temporary and minor due to the low likelihood of the event occurring and its limited duration if it did. See comment to Section 4.7.12.1 above.

Section 4.7.13, Recreation

Section 4.7.13, Recreation, page 4-98

The assessment of impacts to recreational areas lacks any effort to identify the probability of these events occurring in a manner that impacts recreational opportunities. The analysis simply assumes that all oil released in a rail incident would reach and impact these recreational opportunities. The DEIS does not include supporting analysis for this broad-based conclusion. The underlying risk events are improbable and not based on risk analysis. *See* comments on Section 4.4. As a result, the DEIS erroneously identifies as "significant" those risks that are, by its own analysis, remote. As noted in introductory comments to Section 4.1, likelihood of an event is an important factor when determining whether an impact is significant.

Additionally, as indicated in introductory comments to Section 4.1, this impact analysis of spill, fire or explosion from rail transportation does not adequately consider the No Action Alternative. Under the No Action Alternative, other entities will continue to use and likely increase the use of the railway corridor to transport crude oil to meet the current and future demand of West Coast refineries. To the extent that there is a risk of derailment event involving released crude, that risk exists under the No Action Alternative.

Moreover, the analysis makes no effort to quantify or study the likelihood that an already unlikely event will occur in proximity to recreational opportunities. Instead the DEIS simply assumes a risk that is "major" because it assumes it is possible. The likelihood of a large rail

spill or explosion event affecting significant portions of the assessed mile-wide rail corridor or reaching a recreational opportunity would be even lower than the likelihood of the improbable large spill events. Thus, the conclusions are not supported by analysis. Indeed, the analysis prepared by Barkan, Saat, and Ramos quantifies the probability that a derailment event will occur at any given mile of the track. (Barkan et al., 2016[7]). This very low probability event does not rise to the level of significance.

More generally, these impacts are overstated, as impacts are likely to be temporary nature. In many areas, wildland fires are frequent occurrences and may lead to temporary closures, but rarely result in permanent destruction of the resource. As an example, the Pacific Crest National Scenic Trail is located in fire prone areas[71] and is subject to occasional closure due to wildfire[72]. Impacts from a fire resulting from facility related trains would likely be similar in nature. The DEIS should be corrected to reflect the temporary nature of these potential impacts.

Section 4.7.14, Historic and Cultural Resources

Section 4.7.14.1 Proposed Facility, Crude Oil Spill, pages 4-100 to -101, paragraph 5

The DEIS states that if an oil spill of any size reached the Columbia River from the Facility, usual and accustomed (U&A) fishing and hunting areas for several treaty tribes could be impacted from between one to seven river miles downstream. As noted in comments to Sections 4.4 and 4.7.4.1, this assumption that facility spills could reach the water ignores the low probability of that event and ignores containment and design measures as well as response measures.

Additionally, as noted in comments to Section 3.1 of the DEIS, no U&A fishing or hunting places exist downstream of the Facility for any Treaty Tribe. All adjudicated U&A fishing places exist above the Bonneville Dam, significantly upriver from the Facility. Reference to impacts on downstream U&A fishing and hunting areas should be removed from this section of the DEIS.

Section 4.7.14.1 Proposed Facility, Crude Oil Fire or Explosion, page 4-101

The DEIS indicates that a large fire and/or explosion could impact surrounding historic and archaeological resources by ejecting debris beyond the proposed Facility and site.

Additionally, the DEIS suggests that a large fire or explosion debris could produce both major and temporary impacts to surrounding U&A resources.

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[71] http://www.pcta.org/discover-the-trail/backcountry-basics/fire/

[72] http://www.pcta.org/discover-the-trail/trail-conditions-and-closures

As described in comments to Section 4.7.1, the discussion in this section of flammability of crude oil includes errors and overstatements that must be corrected (BakerRisk, 2016[5], Wright, 2016[11]). It is important for the DEIS to accurately define the potential scope of a fire or explosion or spill based on an accurate understanding of the behavior of crude oil.

Additionally, this analysis overestimates the potential impact to historic and cultural resources. As noted in Section 3.13.2.1 there are no archaeologic or historic resources on the proposed Facility site and limited resources in the surrounding areas. Any impact is overstated. In addition, the analysis specifically identifies that access to the Great Western Malting Plant could be temporarily limited. The plant is located in a secured area of the Port and it not open to general visitors. Therefore, any closure due to Facility related issues would not affect public access to this historic resource. The DEIS should be corrected to reflect these conditions and adjust the impacts to minor or negligible.

Additionally, no U&A fishing or hunting places exist downstream of the Facility for any Treaty Tribe as previously indicated. Reference to temporary or permanent of impacts to U&A fishing and hunting places should be removed from this section of the DEIS.

Section 4.7.14.2, Rail Transportation, page 4-102

First, as indicated in introductory comments to Section 4.1, this impact analysis of spill, fire or explosion from rail transportation does not adequately consider the No Action Alternative, and the likelihood that other entities will continue to use and likely increase the use of the railway corridor to transport crude oil to meet the current and future demand of West Coast refineries. To the extent that there is a risk of derailment event involving released crude, that risk exists under the No Action Alternative.

Additionally, the analysis makes no effort to quantify or study the likelihood that an already unlikely event will occur in proximity to Cultural Resources. Instead the DEIS simply assumes a risk that is "major" because it assumes it is possible. The likelihood of a large rail spill or explosion event affecting significant portions of the assessed mile-wide rail corridor or reaching Cultural Resources would be even lower than the likelihood of the improbable large spill or explosion events. Thus, the conclusions are not supported by analysis. Indeed, the analysis prepared by Barkan, Saat, and Ramos quantifies the probability that a derailment event will occur at any given mile of the track. (Barkan et al., 2016[7]). This very low probability event does not rise to the level of significance.

Section 4.7.14.3, Vessel Transportation, page 4-95

The conclusion that a spill or explosion along the vessel corridor could result in moderate to major impacts is not supported by analysis.

The DEIS assumes that oil spilled in the water would reach and impact cultural resources. The DEIS does not include supporting analysis for this broad-based conclusion. Nor does the DEIS consider spill response strategies contained the Northwest Contingency Plan and Geographic Response Plans that are activated in the event of a spill. These strategies include booming to protect specific sensitive resources and cleanup measures to contain oil on the water and collect it. This omission is significant.

Additionally, the analysis does not include an assessment of the likelihood of the event. As noted in introductory comments to Section 4.1, the likelihood of an event is an important factor when determining whether an impact is significant. DNV GL has prepared a risk-assessment, which applies commonly accepted methodology and defines the risk without inappropriate reliance on regulatory worst-case discharge. In particular, the discussion in the DEIS of fire or explosion on a vessel does not include any discussion of the probability of that event occurring. As indicated in comments to Section 4.6.5.2, the study prepared by DNV GL models the likelihood of an explosion on a vessel, among other events, and demonstrates the any fire or explosion scenario is extremely unlikely (DNV GL, 2016[8]).

Section 4.7.15, Transportation

Section 4.7.15.1, Facility Spills and Explosions, pages 4-104 to 4-105

This section repeats previously identified errors including relying on unsupported assumptions about consequence without consideration of probability. The discussion in this section of flammability of crude oil and facility spills includes errors and overstatements that must be corrected (BakerRisk, 2016[5], Wright, 2016[11]). It is important for the DEIS to accurately define the potential scope of a fire or explosion or spill based on an accurate understanding of the behavior of crude oil. The facility spill and fire scenarios described are not consistent with how crude oil behaves (BakerRisk, 2016[5], Wright, 2016[11]). Additionally, as described in comments to Section 4.7.4.1 and 4.7.6.1, the spill discussion ignores secondary containment and ignores topography that would prevent the spill from crossing roads.

Section 4.7.15.2, Rail Transportation, pages 4-104 to 4-105

First, as indicated in introductory comments to Section 4.1, this impact analysis of spill, fire or explosion from rail transportation does not adequately consider the No Action Alternative, and the likelihood that other entities will continue to use and likely increase the use of the railway corridor to transport crude oil to meet the current and future demand of West Coast refineries. To the extent that there is a risk of derailment event involving released crude, that risk exists under the No Action Alternative.

Additionally, the analysis makes no effort to quantify or study the likelihood that an already unlikely event will occur in proximity to an at-grade crossing or other specific transportation infrastructure. Instead the DEIS simply assumes a risk that is “major” because it assumes it is possible. The likelihood of a large rail spill or explosion event affecting significant portions of

the assessed mile-wide rail corridor or reaching at grade crossing would be even lower than the likelihood of the improbable large spill events. Thus the conclusions are not supported by analysis. Indeed, the analysis prepared by Barkan, Saat and Ramos quantifies the probability that a derailment event will occur at any given mile of the track. (Barkan et al., 2016[7]). This very low probability event does not rise to the level of significance.

Moreover, the assumption that closures of tracks and at-grade crossings following derailment with spill or fire will be of "long-duration" is not supported by any analysis and is based exclusively on conjecture. EFSEC should consult directly with BNSF about this topic.

Section 4.7.15.3, Vessel Transportation, page 4-104, paragraphs 3 and 4

The analysis and conclusion related to impacts of a vessel incident on transportation fails to take into consideration spill response strategies contained the Northwest Contingency Plan and Geographic Response Plans that are activated in the event of a spill. These strategies include booming to protect specific sensitive resources and cleanup measures to contain oil on the water and collect it. This omission is significant.

Additionally, the analysis does not include an assessment of the likelihood of the event. As noted in introductory comments to Section 4.1, the likelihood of an event is an important factor when determining whether an impact is significant. DNV GL has prepared a risk-assessment, which applies commonly accepted methodology and defines the risk without inappropriate reliance on worst case discharge. In particular, discussion of fire or explosion on a vessel in the DEIS does not include any discussion of the probability of that event occurring. As indicated in comments to Section 4.6.5.2, the study prepared by DNV GL models the likelihood of an explosion on a vessel, among other events, and demonstrates the any fire or explosion scenario is extremely unlikely (DNV GL, 2016[8]).

Section 4.7.16 Public Services

Section 4.7.16.1, Proposed Facility, pages 4-105 to 4-106

This section repeats previously identified errors including relying on unsupported assumptions about consequence without consideration of probability. The discussion in this section of flammability of crude oil includes errors and overstatements that must be corrected (BakerRisk, 2016[5], Wright, 2016[11]). It is important for the DEIS to accurately define the potential scope of a fire or explosion or spill based on an accurate understanding of the behavior of crude oil. Additionally, as described in comments to Sections 4.7.4.1 and 4.7.6.1, the spill discussion ignores secondary containment and fire suppression infrastructure at the Facility.

As discussed comments to Section 4.6.3.3, VFD gap analysis should be conducted to develop a complete understanding of the proposed Facility design and the VFD operational capabilities.

Section 4.7.16.2, Rail

First, as indicated in introductory comments to Section 4.1, this impact analysis of spill, fire or explosion from rail transportation does not adequately consider the No Action Alternative and the likelihood that other entities will continue to use and likely increase the use of the railway corridor to transport crude oil to meet the current and future demand of West Coast refineries. To the extent that there is a risk of derailment event involving released crude, that risk exists under the No Action Alternative.

Similarly, the DEIS statement of potential impact to emergency response services if personnel are responding to an incident associated with the rail transportation ignores incident response mechanisms and mutual aid procedures described above. It ignores the probability of the event, despite the fact that SEPA requires consideration of probability when determining whether an impact is significant. The impact analysis relies on the assumption that the rail event will occur in the proximity of specific populations or place. However, the analysis prepared by Barkan, Saat and Ramos quantifies the probability that a derailment event will occur at any given mile of the track. (Barkan et al., 2016[7]). This very low probability event does not rise to the level of significance.

Section 4.7.17, Socioeconomics

Section 4.7.17.1, Proposed Facility, Crude Oil Spill, pages 4-109 to 4-110

Impacts to Employment and Income from an accident or spill at the Facility or rail transport of crude to the Facility are identified in Sections 4.7.17.1 and 4.7.17.2, respectively. These impacts tend to overstate the economic impacts of these risks by both overstating the impacts associated with the accidents, should they occur, and by failing to appropriately consider the likelihood that such accidents occur. The likelihood that these accidents occur, particularly a "large" or "very large" spill, is very low (BakerRisk, 2016[5]) suggesting that the weight placed on the economic impacts associated with these occurrences should also be low.

The DEIS describes potential impacts to fishing activity in the event of a spill at the Facility. The impacts discussion assumes that the entire economic activity associated with all fishing activity in the Columbia River would be lost for the entire duration of any restriction or closure of fishing activity. However, this assumption overstates the likely impact from any restriction or closure for several reasons. First, fishermen may be able to shift the location of their fishing activity to areas that are not covered by the restriction or closure. Second, fishermen may shift the timing of their fishing activity. If fishing is restricted or closed for a period, they may be able to increase fishing activity during periods when the fishing area is restricted or closed to compensate for the temporary restriction on fishing activity. For these reasons, lost economic activity from any spill would be less than that assumed in the DEIS.

The DEIS also describes impacts from vessel diversions in the event of a spill at the Facility. As with the response of fishermen to a restriction in fishing activity, when assessing impacts, it is important to evaluate the responses of businesses to such a diversion in vessels. First, vessels may shift the timing of their landings. For example, the source relied on by the DEIS for estimates of the impacts of vessel delays assumed that business was delayed, but was not actually eliminated.[73] That is, vessel diversions may delay the timing of *when* landings occur, but not eliminate the landings (and the associated economic activity) entirely.[74] Second, vessels unable to land at the Port of Vancouver due to a diversion may be able to shift landings to other ports (e.g., the Port of Portland or the Port of Longview), which would produce economic activity for region, albeit potentially at a greater distance to the Vancouver region.

The DEIS analysis of a discharge during rail transportation identifies current economic activity associated with recreational fishing and tourism in the Columbia River Gorge, suggesting that all of this economic activity would be eliminated in the event of a spill. However, such a conclusion overstates likely impacts. First, for such impacts to occur, a spill would need to occur on portions of the rail route adjacent to the Columbia River and would have to result into discharge into the Columbia River. However, a large portion of the rail route does not occur in close proximity to the River and, if a spill where to occur, it would not necessarily result in discharge into the River. Thus, the likelihood that a rail accident results in the types of economic consequences described, is even smaller than the likelihood that a rail accident occurs, which is quite low.

Second, the DEIS fails to consider the many changes in behavior and substitutions that are made in response to restrictions in certain recreational activities. First, a spill may not lead to a complete restriction on fishing activity, but may only lead to advisories, particularly with respect to the fish consumption. In this case, many fishermen may continue to fish, despite the reduced pleasure received from the recreational experience. Second, to the extent that a spill results in reduced recreational fishing, people will shift their free time to other sorts of recreational activity that can also result in economic activity, depending on particular activities undertaken. The Columbia River Gorge offers multiple recreational and tourism opportunities, not all of which are connected to recreational fishing activity. The DEIS fails to consider these types of responses. Consequently, the suggestion that the described levels of impact would arise from a rail accident is not reasonable.

Additionally, the following changes must be made to the DEIS analysis:

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[73] "Business was assumed to be delayed rather than completely voided." Ecology, 2005, p. 9.

[74] Further, some of the findings in the source relied on in the DEIS for certain impacts estimates, Ecology (2005), raise questions about its reliability. For example, the study reports significant differences in the daily impact of port disruption due to an oil spill. While the study identifies a daily "wage" impact of over $1 million to the Port of Vancouver, the impacts to other Ports are orders of magnitude smaller for larger ports: $762,430 for Portland, $179,517 for Seattle, and $1,849 for Anacortes. The study does not explain these differences.

Section 4.7.17.1, Proposed Facility, Crude Oil Fire or Explosion, Population and Housing, page 4-110

The DEIS statement regarding the potential for impact (*injury or death of local residents and housing damage or destruction*) is overstated, given location of the facility and distance to local residential uses. This statement should be removed. The same comment applies to the discussion under Environmental Justice on page 4-111. As indicated in comments to Section 3.16.3.2, the analysis is flawed. Those populations are too far away to be impacted.

Section 4.7.17.1, Rail Facility, Crude Oil Spill, page 4-112, paragraphs 1 and 2

The DEIS errs in annualizing these values without an accurate discussion of the duration of any impact if there were a spill. Thus, the DEIS misrepresents the magnitude of the potential impact. Further, the DEIS ignores the potential offsetting economic benefit from spill cleanup economic activity.

Section 4.7.17, Rail Facility Crude Oil Spill, Environmental Justice, page 4-112

The analysis of environmental justice issues in this section of the DEIS repeats the same errors identified in comments to Section 3.16.3.2. In short, the analysis of environmental justice population impact in the DEIS fails to recognize that the rail line already exists. The Proposal is not siting a new rail line in this area, nor even proposing to construct additional rail lines in these areas. Rather, the purported impact at issue relates to the use of existing rail system, existing rail traffic with similar commodities present, with existing populations in the vicinity. Thus, impacts to existing environmental justice population from rail operations is an existing impact, not a new impact created by the Proposal. This same impact would occur under the No Action Alternative.

Additionally, the methodology is flawed. The DEIS does not explain or justify the selection of the affected area for purposes of determining this specific impact. The environmental justice analysis incorrectly defines the affected area and the comparison population in determining whether the proposed action will have disproportionately high impacts on minority and low-income populations. The DEIS incorrectly conflates the "affected area" with individual census tracts.

Section 4.9 Additional Mitigation Measures to Address the Risks of and Impacts from a Crude Oil Spill, Fire, and/or Explosion

Section 4.9.1, Legislative Actions

The DEIS, Section 4.9.1, page 4-116, recommends implementation of twenty-five of the prevention-based recommendations contained in the 2014 Washington State Marine and Rail Oil Transportation Study. In some cases, these measures have already been acted upon by the parties or entities responsible for those actions (such as federal tank car rulemaking and state crude oil transportation legislation). Others involve study or action by entities beyond the

Applicant's control or, in some cases, even ability to participate. For those recommendations that have been reviewed and acted upon by the responsible level of government with authority to make those decisions (e.g., US DOT, Washington State Legislature), neither the Applicant nor EFSEC have any ability to require additional or different action. While reference to these recommendations may be appropriate to include as information in a regulatory background context, it is confusing to label these as mitigation measures for these reasons.

Additionally, as described in Section 2.8.2.5 above, No Action Alternative, these measures are not designed to address impacts unique to Project rail or vessel traffic, but are related to crude oil transport generally (which is expected to continue under the No Action Alternative) and thus are prevention-based measures that have the same relevance even if the Project is not built. For these reasons, it is not clear what the DEIS intends regarding Project Site Certificate conditions regarding these matters that are all actions to be completed by others with or without the Project. The FEIS should clarify that these are not intended as Project mitigation measures. See also, SEPA authority and mitigation discussions at Sections 3.0.3 and 3.0.4 of this comment letter.

Section 4.9.2, Mitigation Measures for the Applicant to Implement

This section of the DEIS identifies 11 mitigation measures for the Applicant to implement. The Applicant's comments are briefly summarized in the table that follows. Many of these mitigation measures are discussed in greater detail in the Applicant's comments to Chapters 2, 3, and 4 of the DEIS. Other mitigation measures not previously discussed are discussed in more detail following the table.

Additionally, some of the mitigation measures listed in Section 4.9.2 apply to crude transport generally and are not unique to the Project. As such, as discussed in more detail in Section 2.8.2.5 No Action Alternative, those impacts are likely to be similar with or without the Project and thus responsibility for the mitigation should be shared more broadly and not be solely the responsibility of the Applicant. See also, SEPA authority and mitigation discussions at the comments to Sections 3.0.3 and 3.0.4 of this comment letter.

	4.9.2 Mitigation	Chapter 3 Comment
1	Secondary Containment for Transfer Pipeline	See comment below.
2	Seismic Ground Improvements	See comment to Section 3.1.5
3	Tank Car Standards	The federal government has completed rulemaking for the proposed DOT-117 tank car standard, including a retrofit schedule, after robust stakeholder input and additional refinement by the United States Congress. These tank car standards are governed by federal law and EFSEC should not impose a standard or schedule that varies from that recently-established federal requirement. See also, comment to Section 2.4.4.1
4	Incident Response Training and Equipment	The Applicant will follow the training requirements outlined in both Federal and State law for the type of facility and comply with the equipment deployments

	4.9.2 Mitigation	Chapter 3 Comment
		and training to use it effectively. Vancouver Energy believes this should satisfy this mitigation measure.
5	Annual VFD Facility Training	Tesoro has committed to provide training at no cost for members of the VFD at the nationally recognized Texas A&M Engineering Extension Service's Emergency Training Services Institute on a bi-annual basis. See comment to Section 4.6.3.3. Vancouver Energy believes this should satisfy this mitigation measure.
6	Dilbit Research	See comment below.
7.	Develop heavy crude response strategies	See comment below.
8.	Contribute to GRP updates	Tesoro has and will continue to participate in the NWACP process and specifically GRP updates and participating in the testing of written GRP strategy to validate their accuracy. Vancouver Energy believes this should satisfy this mitigation measure.
9	Response strategies for environmentally sensitive areas on the Lower Columbia	See comment to Section 4.6.5.
10	Engineering study to improve oil recovery strategies	See comment below.
11	Independent study regarding appropriate amount for financial assurances	The Applicant is fully prepared to provide appropriate financial assurances to address potential worst case discharge at the facility, consistent with the requirements of RCW 88.40.025. Vancouver Energy believes this should satisfy this mitigation measure.

Section 4.9.2, Mitigation Measures for the Applicant to Implement, bullet 1 (Secondary Containment for Transfer Pipeline)

The DEIS presents a proposed mitigation measure to provide secondary containment for aboveground transfer pipelines to reduce the risk of spills to the environment.

The facility includes secondary containment measures required in 40 CFR 112.7(c). The SPCC Rule identify specific containment capacities for tanks and loading racks and generalizes the requirements for secondary containments elsewhere such as non-rack transfer piping. The rule states that "In determining the method, design, and capacity for secondary containment, you need only to address the typical failure mode, and the most likely quantity of oil that would be discharged."

Based upon the requirements of 40 CFR 112.7(c) the facility is providing secondary containment along the transfer piping to contain drips and leaks up to 5 gallons. The typical failure mode contributing to releases along transfer piping are localized damage, corrosion, pinholes, and/or small leaks at fittings and flanges along the corridor. In addition to the containment measures already proposed, the facility design includes:

1. Wraps installed around all fittings and flanges that will visually change color in the presence of hydrocarbons to detect drips and slow leaks at fittings before product can reach soils below.
2. Pipeline leak detection meeting requirements of WAC 480-75-300.

The NPDES Engineering Report dated 15 October 2015 specifically describes the provisions located along the transfer pipeline to minimize potential for typical releases to enter the environment. An excerpt from Section 5.2.5 Area 500 – Transfer Pipelines is included below:

> "The project has identified the downstream catch basins and area inlets within the immediate vicinity of the transfer pipelines. The locations of retrofitted catch basins is specified on the Environmental Control plans submitted in Appendix C. Spill traps capable of retaining a minimum of 5 gallons of oil will be retrofitted on the downstream stormwater system. The transfer pipeline corridor will be inspected visually every day for damage, corrosion, and pinholes. Leak detection monitors based on flow volumes will also be installed on the pipelines and monitor constantly for any sign of damage or leaks in the pipelines. Inspection of the downstream stormwater inlets for oil sheen will be performed weekly.
>
> "Belowgrade sections of pipeline will additionally be installed with leak detection to monitor for leaks or groundwater intrusion. Transition vaults between abovegrade sections of pipeline and belowgrade sections will be inspected weekly."

Below grade piping will also have protective coating, cathodic protection, or both to prevent corrosion in those areas.

Environmental protection from facility spills are provided through the required spill prevention control and countermeasures plan and requirements for spill response planning. Provisions for spill response have been submitted to EFSEC in the preliminary Operations SPCC dated 23 June 2015.

Compliance with the requirements of 40 CFR 112.7(c) is part of comprehensive approach to protect the surface and groundwater resources. Combined with required response planning, facility design elements, and operational BMPs the likelihood of spills occurring which would be of significant volume are low. Table 4.5 of the DEIS estimates that a release of <1 bbl would occur once every 14-years, with the worst case discharge occurring every 1,587 years.

The DEIS, in Section 4.6.3.1, should be updated to reflect the facility's compliance with 40 CFR 112.7(c) based upon the secondary containment provided at the facility to address "typical" failure modes.

The mitigation measure to provide secondary containment for aboveground transfer pipelines should be removed from the DEIS to reflect the secondary containment provided in accordance with 40 CFR 112.7(c).

Section 4.9.2, Mitigation Measures for the Applicant to Implement, bullet 6 (Dilbit research)

There is existing, long-funded, and long-studied research, technology, and equipment for responding to spills of heavy crude such as dilbit. National regulatory agencies and industry

associations (such as API) have studied the characteristics and appropriate spill responses to the range of grades of crude oil, including dilbit. There is no unique research, technology, or equipment that would only be applicable to response to an oil spill at or near the Facility. Accordingly, it is not clear whether this proposed mitigation is targeted to any specific gaps in response to this product which are not already addressed in existing research, technology, and equipment. See also, comment at Section 4.5.3, 4.5.4 and 4.5.5.

Section 4.9.2, Mitigation Measures for the Applicant to Implement, bullet 7 (Dilbit response strategies)

Dilbit characteristics are sufficiently known to plan response strategies, and such strategies have been and continue to be developed for the Facility. As with all oil spills, quick intervention is essential to effectively protect sensitive areas, contain and recover spilled oil, and undertake appropriate cleanup. Although dilbits weather to higher viscosities and densities in a relatively short timeframe compared to Bakken crude, spill countermeasures applicable to conventional oils are similarly applicable to pipeline grade dilbit spills. Should a portion of a spill eventually submerge or sink, technologies such as those noted in the API Sunken Oil Detection and Recovery Response Guide and Operational Guide (API in press A and B) would be implemented to track and, where a net environmental benefit is gained, recover the oil. See also comment at Sections 4.5.3, 4.5.4, and 4.5.5.

Section 4.9.2, Mitigation Measures for the Applicant to Implement, bullet 10 (Independent Engineering analysis of strategies to improve oil recovery (pre-booming))

This mitigation measure appears to ignore the pre-booming analysis that has been completed by the Applicant. Pre-booming is included in the Operations Oil Handling Manual (OOHM) included in Appendix D of the DEIS. The pre-booming plan in the OOHM includes an analysis of sea conditions when safe and effective to pre-boom (OOHM Appendix K, Safe and Effective Threshold Determination Report). There is also an Oil Spill Contingency Plan (OSCP), also included in Appendix D of the DEIS, that describes oil spill response actions and procedures. The OOHM and OSCP were prepared by spill response professionals, and include consideration of local conditions, and analyses of necessary containment and cleanup equipment necessary to respond to spills (consistent with industry standards and federal and state regulation). The NOFI Current Busters that Vancouver Energy has purchased are state-of-the-art technology for containing oil in currents up to 5 knots. The Department of Ecology has been impressed with the capability and has recommended the buster technology be added to the law as part of HB1186. The information already provided should be sufficient to satisfy this mitigation measure, as evidenced by Ecology's reaction to the buster technology.

The Operations Oil Handling Manual and Oil Spill Contingency Plan included in Appendix D of the DEIS addresses this issue.

Section 4.9.3 Mitigation Measures Involving EFSEC, the Applicant, and Other Agencies and/or Private Organizations

Similar to the 2014 Ecology study recommendations described in Section 4.9.1, the mitigation measures listed in the section are admittedly measures that can only be performed by others, in some cases with no meaningful opportunity for the Applicant to even influence the outcome. The FEIS should revise the discussion of these measures as actions that may be occurring in the regulatory or planning context by others, but not actions that must be completed prior to project construction or operation, and not actions that the Applicant is required to implement as project mitigation. See also, SEPA authority and mitigation discussions at comments to Sections 3.0.3 and 3.0.4 of this comment letter.

The following table summarizes the mitigation measure and describes what role, if any, the Applicant is able to play in achieving each measure:

	4.9.3 Mitigation	Comment
1	Ecology verify spill contingency planning volume	The Applicant believes the current volume (largest storage tank plus margin) is adequate. Additionally, as discussed at Section 4.7.4.1, the Applicant has designed the containment berm to exceed the current regulatory standard. Because this mitigation measure, as drafted, imposes an obligation on Ecology, rather than the Applicant, it should not be identified as a project mitigation or condition.
2	Review of 100% (final) design of fire protection system	This mitigation measure can be implemented as part of construction plan review and approval.
3	MFSA update to VRP	Vancouver Energy will work with MFSA to add appropriate resources to increase the planning standards consistent with this mitigation recommendation. MFSA is responsible for submitting the revisions to Ecology for approval.
4	Columbia River Vessel Traffic Management System Update	This is not something the Applicant can implement. The Applicant is willing to participate in these efforts, but cannot be responsible for process or outcomes, since these organizations function independently.
5	Columbia River Vessel Traffic Risk Assessment	This is not something the Applicant can implement. The Applicant is actively participating in the Lower Columbia River Committee that Ecology has convened to oversee this Assessment, but the Applicant cannot be responsible for the process or outcomes.
6.	Coordination with LEPC	The Applicant is willing to participate in these efforts, but cannot be responsible for process or outcomes, since these organizations function independently.
7	Coordinate with State Fire Defense Committee on response and evacuation plans	The Applicant is willing to participate in these efforts, but cannot be responsible for process or outcomes, since these organizations function independently.

Section 4.10, Potential Significant Unavoidable Adverse Impacts

Section 4.10, Potential Significant Unavoidable Adverse Impacts, pages 4-118 to 4-119

As described in the comments to the analysis in each of the elements of the environment, the conclusion that there are significant unavoidable adverse impacts is in error. Most importantly,

the DEIS takes a consequence-based approach and looks exclusively on the maximum identified consequence without regard for the associated frequencies. Under SEPA, probability is a crucial element in the analysis of whether an impact is "significant." As discussed in detail above, under SEPA, and EIS is only required to analyze "probable significant" adverse environmental impacts. Improbable and remote "unprecedented" events are not "significant" impacts. Characterizing them as "significant unavoidable adverse impacts" violates SEPA.

In many instances, the analysis ignores the No Action Alternative. It ignores the behavior and characterization of crude oil in these types of events. It ignores spill preparedness and response measures and Facility design. For these reasons, the conclusions summarized in Section 4.10 are in error.

In addition to the generic statements about risk of spill and fire from all the scenarios previously addressed earlier in chapter 4, Section 4.10 also describes a specific "unprecedented" scenario which it determines are significant because the "possibility cannot be totally eliminated."

The discussion in the DEIS of this specific example in the culminating section of Chapter 4 is fitting because it captures the inherent flaw in the analysis. SEPA does not require absolute certainty that a risk will be eliminated in order be less than "significant." Instead, risk assessment of unlikely major accident hazards has well-documented standard scientific practices. The guideline used depends on the nature of the hazard. The described "unprecedented event" strains the limits of the word credible. These types of hypotheticals cannot form the basis for SEPA review.

COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR VANCOUVER ENERGY

CHAPTER 5: CUMULATIVE IMPACTS

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General Comments to Chapter 5

The comments in this section pertain to issues unique to the cumulative impacts chapter. To the extent that the issues identified in comments on earlier chapters elsewhere in this letter provide the basis for the cumulative impacts analysis, we do not repeat our concerns and comments in this chapter and rely on our earlier discussion. Any comments on earlier chapters that identify necessary changes should be carried through to the cumulative impacts analysis.

Section 5.1, Analysis of Cumulative Impacts

Although in the introductory paragraphs to Chapter 5 of the Draft Environmental Impact Statement (DEIS) states that State Environmental Policy Act (SEPA) requires that cumulative impacts be addressed for the Proposed Action and alternatives to the Proposed Action per WAC 197-11-792, the DEIS omits the analysis of the cumulative impacts of the No Action Alternative. An analysis of the cumulative impacts resulting from the No Action Alternative must be included as a distinct and separate subsection for each element of the environment discussed in Chapter 5. The analysis must include all impacts related to the full definition of the No Action Alternative provided in Section 2.8.2.5, including, specifically, a discussion in each No Action Alternative section recognizing impacts from the other identified projects related to rail and vessel traffic that would occur in the absence of the Facility. See additional discussion of the No Action Alternative in Section 2.8.2.5 of this comment letter.

Furthermore, Chapter 5, Cumulative Impacts, fails to acknowledge that while SEPA provides for evaluation of reasonably foreseeable cumulative impacts, SEPA does not provide substantive authority to condition the Proposed Project based on impacts that are attributable to other projects. See the previous comment to Section 3.0.4 of the DEIS. Thus, throughout Chapter 5, the impact conclusions and mitigation recommendations should distinguish what might be the impact and, therefore, the mitigation responsibility of the project and what might be the impact and responsibility of other projects, or of existing background transportation conditions, including projected growth of those transportation conditions.

Section 5.1.3, Identification of Projects and Actions for the Cumulative Impacts Analysis, page 5-3

The DEIS assumes, for its cumulative impacts analysis, that all projects listed in Table 5-2 could be permitted and operated. However, it also acknowledges that uncertainty exists as to which proposed projects might actually come to fruition:

> *The identification of future projects, actions and trends involves some uncertainty, as does the assessment of the intensity, magnitude, and duration of impacts now and in the future.*

Although the DEIS should identify the conservative scenario that all proposed projects would be constructed and operated, the analysis of cumulative impacts should more reasonably focus on cumulative scenarios that are more likely to occur.

The DEIS also acknowledges on page 5-3 that:

> *Rail and vessel transportation are dynamic systems with constantly moving freight and passenger trains and vessels that change from season to season and from year to year.*

The conclusions regarding cumulative impact of Facility-related train and vessel traffic throughout Chapter 5 must be placed in that context to determine whether these additional trips would even cause a measurable increase in the normal ebb and flow of the rail and vessel transportation systems with respect to the existing baseline or with a reasonable regional growth scenario.

DNV GL has provided a realistic estimate of what a realistic "future" baseline for vessel traffic on the Columbia River would be (DNV GL 2016a[1]; DNV GL, 2016b[2]). This is especially important in consideration of recent information regarding increased uncertainty surrounding the viability of the Millennium Bulk Terminal proposed in Longview, Washington, in light of the recent bankruptcy announcement of one of its key investors. (Britt, 2016)[3].

Section 5.1.3, Identification of Projects and Actions for the Cumulative Impacts Analysis, pages 5-4 to 5-7, Table 5-1

Table 5-1 should be corrected to reflect a more accurate description of the projects identified below.

Only one storage tank at the NuStar facility is being converted to crude oil storage as indicated in Table 7.1-1 of the Preliminary DEIS (PDEIS). The text in Table 5-1 should be corrected as follows:

> *NuStar has proposed to convert* one *existing bulk liquid storage* tank *and* install associated crude oil *transfer equipment at the main and annex terminals to* allow *crude oil service.*

The Table 5-1 entry regarding the Vancouver Waterfront Development Project should be revised to reflect that although it may have been scheduled to be completed in spring of 2016, the completion date has been delayed, and building construction has not started as of the writing of the DEIS.

[1] DNV GL. 2016a. 2014 AIS Traffice Analysis. Memo No. PP111860-M1 Rev 1. January 21, 2016.
[2] DNV GL. 2016b. Vancouver Energy Terminal Quantitative Vessel Traffic Risk Assessment. January 2016.
[3] Britt, 2016. Arch Coal receives broad lender support for bankruptcy plan. January 12, 2016. Available at: http://www.reuters.com/article/us-arch-coal-bankruptcy-idUSKCN0UQ2OZ20160112. Accessed January 15, 2016.

Section 5.1.3, Identification of Projects and Actions for the Cumulative Impacts Analysis, pages 5-8 to 5-12, Table 5-2

Table 5-2 must be corrected as indicated below to accurately capture spatial boundaries of cumulative impacts and only consider projects that are currently announced or reasonably expected to proceed.

Table 5.2 does not include consideration of deliveries of Canadian crude oil entering the United States at the international border at Eastport, Idaho, and being delivered to Bakersfield, California, by rail travelling routes through Washington and Oregon (Kelly, 2014[4]; UPRR, 2014[5]). In particular, trains carrying crude oil travelling along the Oregon side of the Columbia River have the potential for similar impacts to the natural and built environment as those travelling through Washington, and much of the spill response infrastructure planned in the Columbia River is coordinated between Washington and Oregon to assure response to incidents no matter which side of the river they occur on. Consideration of this rail traffic is especially important in the analysis of the impacts of the No Action Alternative, as this traffic would be expected to occur/continue with or without the Proposed Action. If the Proposed Action is not implemented, shippers may use other rail carriers to route mid-continental crude oil to West Coast refineries to a greater degree, exposing the same geographical areas to impacts as the Proposed Project-related routes; i.e., the No Action Alternative may result in very similar direct, indirect, and cumulative impacts.

Table 5.2 also does not give consideration to recent reductions in containerized vessel traffic between the mouth of the Columbia River and Portland. The Port of Portland is Oregon's only deep draft international container terminal (Port of Portland, 2015a). As of 2015, two of the major direct-calling container carriers, Hanjin and Hapag Lloyd, pulled out of calling at the Port of Portland (Port of Portland, 2015a[6]); a single carrier remains making monthly calls (Port of

[4] Kelly, Bruce E. 2014. UP begins Canada-to-California CBR Service. Railway Age. November 25, 2014. Available at: http://www.railwayage.com/index.php/freight/class-i/up-begins-canada-to-california-cbr-service.html?channel, accessed December 14, 2015.

[5] Union Pacific Railroad (UPRR). 2014. Transporting Crude Oil, Condensate and NGLs in Rail Tank Cars. July 2014. Available at: https://www.up.com/cs/groups/public/@uprr/@customers/documents/up_pdf_nativedocs/pdf_up_chem_crude_brochure.pdf, accessed December 22, 2015.

[6] Port of Portland. 2015a. Port Dispatch – Portland Preparing for Withdrawal of Largest Container Carrier. February 10, 2015. Available at: https://www.portofportland.com/publications/PortDispatch/post/HanjinWithdrawal2015.aspx, accessed December 22, 2015.

Portland, 2015b[7]; Port of Portland 2015c[8]). Between 2002 and 2013, container vessel calls ranged from 85 to 189 per year at the Port of Portland, averaging at approximately 133 calls per year (U.S. Maritime Administration, no date[9]; U.S. Maritime Administration, 2015[10]).

The Haven Energy proposal should be removed from Table 5-2. This proposal has been cancelled (Port of Longview, 2015)[11].

The BHP Billiton Group proposal at the Port of Vancouver will not proceed as identified in Table 5-2. Although the DEIS is correct in identifying that some permits remain active relative to this proposal, there has not been any information since 2014 indicating the project would be reactivated. Given the uncertainty surrounding the proposal, it should be excluded from the cumulative impacts analysis.

The entry regarding the Imperium Bulk Liquid Terminal proposal should be updated to reflect new ownership by Renewable Energy Group and that the proposal no longer includes trans-shipment of crude oil (Mittan, 2016)[12].

The entry regarding the Morrow Pacific Terminal should be revised to include the information in Table 7.1-1 of the PDEIS relative to the proposal's permits being denied, as this further qualifies the uncertainty of this proposal:

> *Although a recent permit application was denied (ODEQ 2014b), the developer has not publicly stated the proposal is cancelled.*

---

[7] Port of Portland. 2015b. Port Dispatch – T-6 Container Update – Q&A with Sebastian Degens, Port of Portland director of marine marketing. November 18, 2015. Available at: https://www.portofportland.com/publications/PortDispatch/post/T-6-Container-Update-QA-with-Sebastian-Degens.aspx, accessed December 22, 2015.

[8] Port of Portland. 2015c. Port Dispatch – Barge-Rail shuttle service provides shipping relief. November 30, 2015. Available at: https://www.portofportland.com/publications/PortDispatch/?tag=/container, accessed December 22, 2015.

[9] U.S. Maritime Administration. No date. 2002-2012 Total Vessel Calls in U.S. Ports, Terminals and Lightering Areas Report. Commercial Vessels over 10,000 deadweight tons (DWT). Available at: http://www.marad.dot.gov/wp-content/uploads/xls/DS_U.S._Port_Calls_2002-2012.xls, accessed December 22, 2015.

[10] U.S. Maritime Administration. 2015. 2013 Vessel Calls in U.S. Ports and Terminals, Privately-owned, oceangoing merchant vessels over 1,000 gross tons. June 16, 2015. Available at: http://www.marad.dot.gov/wp-content/uploads/pdf/DS_U.S.-Port-Calls-2013.pdf, accessed December 22, 2015.

[11] Port of Longview 2015, March 10, 2015 Special Commission Meeting Minutes, available at: http://www.portoflongview.com/Portals/0/Documents/Commission/M3-10-15.pdf, accessed January 14, 2016.

[12] Mittan 2016. REG abandons crude-oil storage as part of Grays Harbor expansion. January 9, 2016. Available at: http://www.theolympian.com/news/local/article53915075.html. Accessed January 15, 2016.

At Section 5.1.1, the DEIS defines the spatial boundary for cumulative impacts analysis as follows (emphasis added):

> *The proposed Project would affect areas in proximity to Facility features and operations, including an area around the proposed Facility site,* ***and rail systems and navigable waters associated with transport of crude to and from the site****.*

In this context, inclusion of the Burnaby refinery relative to overland crude oil receipts is not warranted. There is no data presented in the references provided in the DEIS that the refinery is sourcing U.S. crude oil; the reference specifically states: "*Located on the shores of Burrard Inlet near Vancouver, the Chevron Burnaby Refinery produces petroleum products from Canadian oil and gas… Raw product arrives at the refinery from northern British Columbia, Alberta, and Saskatchewan via the 1,200-kilometer Kinder Morgan Pipeline, with supplemental deliveries coming by rail and by truck.*" (Chevron, 2015, as cited in the DEIS). The reference "*CBC, 2013*" further cites to the crude being supplied as "*western-Canadian*." Furthermore, there is no data in these references demonstrating that Canadian-sourced crude oil is being transported to the Burnaby Refinery via overland infrastructure located in the United States, let alone in Washington.

Neither of the Puget Sound Energy liquefied natural gas (PSE LNG) project and Tacoma Manufacturing and Methanol Export Facility (TMMEF) proposals include rail transportation activities to receive natural gas. Only bunkering vessels will call at the PSE LNG project, and the trips of these vessels will be limited to the navigable waterways at the tip of the Blair Hylebos Peninsula[13]. Bulk cargo vessels will call at the TMMEF; however, they will use a different navigable water (i.e., Puget Sound, not the Columbia River). Both of these proposals should, therefore, be excluded from consideration of cumulative impacts.

Table 5-2 should be corrected to reflect the information provided above, and the resulting reduction should be considered in the calculation of total vessel traffic throughout Chapter 5 of the DEIS and any impacts resulting therefrom.

Section 5.1.3, Identification of Projects and Actions for the Cumulative Impacts Analysis, pages 5-8 to 5-12, Table 5-2

For several of the entries in Table 5-2, the DEIS identifies "*Potential Cumulatively Impacted Resources*" presumably other than train and vessel traffic resulting from transportation of

[13] "The bunkering barge and associated tugboats would travel from the Tacoma LNG Facility pier within the Hylebos Waterway, around the tip of the Blair-Hylebos peninsula, to the proposed LNG loading platform proposed within the Blair Waterway as part of the TOTE Marine Vessel LNG Fueling System." Ecology and Environment. 2015. Puget Sound Energy Proposed Tacoma Liquefied Natural Gas Project. Final Environmental Impact Statement. Section 3.10.4. September 30, 2015 (Issued November 9, 2015) Available at: https://www.cityoftacoma.org/government/city_departments/planning_and_development_services/planning_services/pse_proposed_tideflats_lng_facility, accessed December 23, 2015

commodities to/from each specific proposal. For example, the proposals for Kalama Millennium Bulk and Oregon LNG list:

> *Air Quality; Water Resources; Terrestrial Vegetation; Terrestrial Wildlife; Aquatic Resources; Environmental Health; Noise; Visual Resources/Aesthetics; Recreation; Historic and Cultural Resources; …*

However, in later sections of Chapter 5, the DEIS fails to address what the potential cumulative impact might be. For example, Section 5.2.1 does not mention what (if any) cumulative air quality impacts might arise from these facilities. However, Section 7.2.2 of the PDEIS specifically addressed the air quality impacts from such facilities in terms of cumulative impacts as follows:

> *"The proposals (as listed in Table 7.1-1) along the Columbia River and at other locations in Washington State could generate similar types and levels of industrial and transportation-related emissions as Facility-related emissions. It is also recognized that many other proposals are permitted on an ongoing basis within the same airshed as the Proposed Action, with varying emission contributions (see, for example, SWCAA's notices of applications for air emission permits[14]). Each proposed source of air emissions must undergo review in accordance with applicable federal, state, and local regulations. Similar to the review process for the Proposed Action (see Section 4.2), appropriate air emission controls are required and the impacts of the emissions are assessed in the context of existing local air quality to ensure that federal, state, and local ambient air quality standards are not exceeded and other human health and environmental related values are protected. In addition, state and federal regulations require increasingly stringent emission controls for various types of transportation-related sources, and transportation-related emissions are expected to continue to decline in the future. For these reasons, significant cumulative air quality impacts are unlikely."*

It could also be that the DEIS meant to address the impacts to these elements of the environment from the transportation activities exclusively; however, this is not clearly stated in the DEIS text.

Table 5-2 of the DEIS text should either be revised to remove those elements for the environment where Energy Facility Site Evaluation Council (EFSEC) judges there is no cumulative impact for each proposal (and, therefore, analysis is not required), clarify that the DEIS is addressing the impacts to those resources from rail and vessel transportation activities, or it should include the analysis of the potential cumulative impact these proposals cumulatively with the Proposed Action for each of the elements of the environment discussed in Sections 5.2 through 5.19.

[14] http://www.swcleanair.org/

Section 5.1.3, Identification of Projects and Actions for the Cumulative Impacts Analysis, page 5-3

Section 5.1.3.2, Rail Traffic in Washington State, page 5-16

This section correctly acknowledges that:

> *The Class I railroads (BNSF and Union Pacific) and other stakeholders are expected to address capacity issues as they emerge (WSDOT 2014a).*

As discussed in comments to Section 3.14, Transportation, this fact is not properly recognized in the project impact and mitigation discussion in Chapter 3.

Section 5.1.3.3, Vessel Traffic on the Columbia River, page 5-19, paragraph 1

The narrative in the "*Description*" column of Table 5-2 identifies the number of vessel trips anticipated for each proposal. The cumulative number of vessel trips is identified in the first paragraph of page 5-19. Table 5-2 and the narrative on page 5-19 should be corrected as noted below with the following ship transit numbers. Note that "trips" below includes two vessel transits, one inbound and one outbound. The DEIS also appears to have interchanged trips and entry transits. In addition, in establishing the baseline of vessel trips, the FEIS needs to consider in its analysis that not all baseline vessel transits or trips travel the entire length of the deep draft navigation as shown in Attachment 4-3. Many vessels that enter the Columbia River stop at facilities in the lower river (i.e., Port of Longview) and would not contribute to cumulative impacts associated with vessel traffic on the stretch of river from the Facility to Longview.

	DEIS – "trips"		Corrected Information Total Transits		Corrected Information Entry Transits		
Project	**Low**	**High**	**Low**	**High**	**low**	**high**	**NOTES/Corrective Action**
Arc Logistics	0	0	0	0	0	0	
Global Partners	52	130	104	260	52	130	Double entry trips for total transits
Haven	24	36	0	0	0	0	Project canceled
KMMEF	104	728	72	144	36	72	Overstated based on information from project.[15]
Millennium	1680	1680	1680	1680	840	840	DEIS includes total transits. Project anticipated 840 trips[16]
Oregon LNG	125	125	250	250	125	125	The DEIS indicates only the number of ships. To correctly identify transits, the number should be doubled to account for entry and exit transits.
Port Westward Methanol.	104	728	72	144	36	72	There are no published sources regarding ship volumes. However, this plant will be similar to the KMMEF project and ship numbers are assumed to be the same.
Morrow Pacific	156	156	256	256	128	128	The biological assessment prepared for the project indicated 128 entry transits. This number is doubled to account for entry and exit transits[17[
Canpotex	0	0	0	0	0	0	No number indicated in table. No published sources on increased vessels.
Subtotal 1	2245	3583	2382	2604	1217	1367	
Baseline 2013	1457	1457	2914	2914	1457	1457	VEAT data reports ship traffic as entry transits. To correctly compare total transits, you need to double the entry transits to account for exit transits.
Subtotal 2	3702	5040	5296	5518	2674	2824	
Project	365	365	730	730	365	365	
TOTAL Transits	4067	5405	6078	6378	3039	3189	

Section 5.1.3.3, Vessel Traffic on the Columbia River, page 5-19, paragraph 2

The DEIS states that:

> *High traffic volumes may increase the risk of an accident and potential oil outflow since a greater number of vessels would be using the Columbia River system.*

This statement should be revised. Although the risk of an accident may be increased from a higher number of vessels, the "potential" for outflow would not increase as that is related to the

[15] Port of Kalama Scoping Meeting Exhibits http://kalamamfgfacilitysepa.com/wp-content/uploads/2014/11/Boards_11-21-14_lo-res.pdf accessed 12 December 2015.

[16] Ecology 2015. Joint Release Cowlitz County, Department of Ecology http://www.ecy.wa.gov/news/2015/155.html accessed 12 December 2015

[17] NOAA 2015. Endangered Species Act Biological and Conference Opinion and Magnuson-Stevens Fisher Conservation and Management Act Essential Fish Habitat Response for the Coyote Island Terminal Coal Transfer Facility

type of incident which occurs, which is independent of the number of vessels using the navigation channel.

Section 5.2, Earth Resources

The impact analysis in the DEIS does not adequately consider the No Action Alternative.

Section 5.2.3, Vessel Transportation, pages 5-22 to 5-23

This section of the DEIS makes various erroneous assumptions, resulting in erroneous conclusions, regarding the cumulative impacts of vessel wakes to shoreline erosion:

> *The cumulative increase in vessel traffic could range from slightly higher than the historical high to well beyond that level, which would likely result in increased wake-induced bank erosion in some areas of the Columbia River...*
>
> *…The potential for soil erosion would be limited to the lower approximately 33 miles of the river where shorelines with beaches close to the channel are not shielded from wave action and have beach slopes less than 10 percent. Wake effects would be the greatest as vessels pass through the Columbia River estuary and its associated habitats including tidal wetlands, shallow water, and tidal flats. The cumulative increase in deep-draft vessel traffic and associated increase in vessel wakes could have a minor to moderate impact to erosion, primarily in the Columbia River estuary.*
>
> *…The potential for soil erosion would be limited to the lower approximately 33 miles of the river where shorelines with beaches close to the channel are not shielded from wave action and have beach slopes less than 10 percent. Wake effects would be the greatest as vessels pass through the Columbia River estuary and its associated habitats including tidal wetlands, shallow water, and tidal flats. The cumulative increase in deep-draft vessel traffic and associated increase in vessel wakes could have a minor to moderate impact to erosion, primarily in the Columbia River estuary.*

Please see the comments to Section 5.1.3 above regarding the uncertainty related to conservative estimates of future number of vessels anticipated to use the Columbia River navigation channel. Please refer to the comment to Section 3.1.3.3 of the DEIS; as demonstrated, the shorelines, which have little susceptibility to erosion, would be subject to an incremental increase in vessel wakes that are not currently causing erosion. Considered altogether, there will not be a cumulative probable significant adverse impact. The comment on Section 3.1.3.3 also provides a correction to the statement regarding the impact that occurs to "*33-miles*" of the Lower Columbia River shorelines.

The following mitigation measure should be removed in the EIS, on the basis that it requires mitigation based on erroneous assumptions and conclusions, and because it requires the Applicant to mitigate impacts that the Proposed Action does not measurably add to:

> *Section 3.6.5 includes mitigation measures to reduce the potential for wake stranding of aquatic species, which would also reduce the rate of erosion from wake-induced effects described herein.*

SEPA and the state and federal constitutions prohibit EFSEC from imposing mitigation unless EFSEC can demonstrate that the mitigation is related to and proportionate to the impacts of the Proposed Action; please refer to the comment to Section 3.0.4 of the DEIS. The recommendation to apply the mitigation described in Section 3.6.5 to address cumulative impacts should, therefore, be removed.

Finally, the impact analysis in the DEIS does not adequately consider the No Action Alternative or complete the analysis necessary to directly attribute any purported impact to the Facility, as distinguished from baseline conditions and non-Facility impacts. As indicated in Sections 2.7 and 5.1.3.3 of the DEIS, the vessel traffic on the Columbia River is well established and has been for over long periods of time. Existing vessel traffic currently creates any purported impacts, and other increases in non-Facility traffic will also continue to create them. According to the analysis in the DEIS, any purported increase in vessel traffic attributable to the Facility is negligible. The analysis and recommendation do not acknowledge that any purported impacts occur from existing vessel traffic and will increase from non-project-related increases in vessel traffic. Accordingly, the vessel traffic associated with Proposed Action does not create an impact distinguishable from the No Action Alternative such that any purported impacts are not attributable to this project.

Section 5.3, Air Quality

The impact analysis in the DEIS does not adequately consider the No Action Alternative.

Section 5.4, Water Resources

The impact analysis in the DEIS does not adequately consider the No Action Alternative.

Section 5.4.3, Vessel Transportation, pages 5-25 to 5-26

Section 3.3.3.3, Aquatic Resources, of the DEIS concludes that (emphasis added):

> *Such temporary increases in turbidity and local redistribution of sediment on the channel bed and/or to active channel bars and floodplain surfaces from vessel transits within the Lower Columbia River would not be considerably different from natural geomorphic processes, nor would it be expected to alter the river channel, its hydrology, or water quality relative to baseline conditions, and it would therefore be considered* ***negligible****.*

However, this section of the DEIS that addresses cumulative effects to water resources associated with vessel transportation states that:

> *Increased vessel traffic associated with the Proposed Action and existing and future actions has the potential to increase erosion caused by vessel wakes, which could increase turbidity and cause localized water quality effects.*

This analysis focuses on bank erosion from wakes as the primary source of potential cumulative impact to water quality. The analysis in this section of the DEIS goes on to conclude that (emphasis added):

> *Water quality impacts from vessels associated with the Proposed Action and existing and future actions may result in* ***minor to moderate*** *cumulative impacts.*

First, if the impact of wakes from Facility-related wakes is deemed "negligible," the DEIS does not demonstrate how this negligible impact would result in a cumulative "minor to moderate" impact of all deep draft vessels transiting the Columbia river. Second, below, deep draft vessels are not expected to cause the types of wakes that would result in turbidity and local redistribution of river sediment, and their associated water quality impacts.

Similar conclusions are drawn regarding water quality impacts resulting from wake-induced erosion:

> *Water quality impacts from vessels associated with the Proposed Action and existing and future actions may result in minor to moderate cumulative impacts. The mitigation measures identified in Section 3.6.5 to reduce the potential for wake stranding of aquatic species would also reduce the water quality effects from wake-induced erosion.*

First, the DEIS at Section 3.3.3.3 concludes such effects are not significantly different from natural geomorphic processes and that the resulting impacts are negligible. Second, as discussed above, the DEIS overestimates the impacts of vessel wakes. Finally, SEPA and the state and federal constitutions prohibit EFSEC from imposing mitigation unless EFSEC can demonstrate that the mitigation is related to and proportionate to the impacts of the proposed action; please refer to the comment to Section 3.0.4 of the DEIS. The recommendation to apply the mitigation described in Section 3.6.5 to address cumulative impacts should, therefore, be removed.

For the same reasons as established above, and based on the demonstrated fact that sediments within the Columbia River navigation channel would not be expected to be contaminated at a level of concern, the following statements that a cumulative effect could occur should be removed:

> *Sediment contamination with polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and polybrominated diphenyl ethers (PBDEs) exists in the Lower Columbia River, and the vessel traffic associated with the Proposed Action in combination with that of other past, present, and reasonably foreseeable future actions could cumulatively increase the concentration of these contaminants in the water column. The rate of concentration of*

contaminants would depend on the number and sizes of vessels that would be used within the Columbia River, and could result in a minor cumulative impact.

Please refer to the comment on Section 3.3.3.3 of the DEIS. As described, any sediment raised by vessels and redeposited, to the extent that this activity would occur, would not be expected to be contaminated at a level of concern, and would, therefore, have only a negligible effect on water quality. The cumulative impact of Facility-related activities with all other vessel traffic would, therefore, also be negligible.

A similar analysis applies to impacts from vessel wakes to wetlands located along the shoreline of the Columbia River. The cumulative impacts associated with vessel wakes will result in only a negligible cumulative impact to wetlands and would be no different from impacts associated with existing and No Action Alternative vessel traffic.

Section 5.5, Terrestrial Vegetation

The impact analysis in the DEIS does not adequately consider the No Action Alternative.

Section 5.5.2, Rail Transportation, page 5-27, first full paragraph

The DEIS concludes there would be moderate incremental cumulative impacts to vegetation communities associated with small spills and leaks and facilitated movements of noxious weeds and invasive plants along rail lines without consideration of how the change relates to existing conditions.

As described in the comments to Section 3.4.3.2, the DEIS has not provided sufficient information to quantify the contribution of a single train to soil hydrocarbon concentrations.

Therefore, the DEIS does not complete the analysis necessary to directly attribute any purported impact to this project, as distinguished from baseline conditions and non-project impacts; therefore, the DEIS errs in making a conclusion that the transportation activity related to the Proposed Action will result in a cumulative impact.

Section 5.5.3, Vessel Transportation, page 5-27, paragraph 1

As noted above for potential water quality impacts resulting from vessel wakes, and as presented in the comment to Section 3.4.3.3 (page 3.4-16) of the DEIS, scientific data supports a conclusion that there will be no cumulative significant adverse impact.

Section 5.6, Terrestrial Wildlife

The impact analysis in the DEIS does not adequately consider the No Action Alternative.

Section 5.6.2, Rail Transportation, page 5-28

The following statement in the DEIS is based on an erroneous assumption that wildlife mortality due to collisions would occur at an equal rate regardless of the habitat quality along the length of the rail corridor, and should be corrected based on the comments provided to Section 3.5.3.2 of the DEIS:

> *The incremental increase in rail traffic associated with the Proposed Action and existing and future actions would likely contribute a moderate increase in wildlife collision mortality. Mitigation measures are identified in Section 3.5.5 to address this impact.*

Furthermore, SEPA and the state and federal constitutions prohibit EFSEC from imposing mitigation unless EFSEC can demonstrate that the mitigation is related to and proportionate to the impacts of the proposed action; please refer to the comment to Section 3.0.4 of the DEIS. The recommendation to apply the mitigation described in Section 3.5.5 to address cumulative impacts should, therefore, be removed.

Section 5.7, Aquatic Resources

The impact analysis in the DEIS does not adequately consider the No Action Alternative.

Section 5.7.3, Vessel Transportation, pages 5-30 to 5-32

Vessel wakes can and do strand small subyearling Chinook salmon from the Lower Columbia River and Upper Willamette River ESUs in the vessel corridor thereby contributing to mortality early in their life cycle. But not every wake strands fish nor does every beach have the physical characteristics that strand fish. Pearson et al. (2006), in the most intensive study of wake stranding, concluded that stranding represented a complex and episodic process related to a multitude of interdependent factors, including site location, a ship's kinetic energy (a function of ship size and speed), tidal height, wave excursion (the maximum drawdown distance plus the maximum run-up distance), and the presence of fish in shallow water. Of the 25 different factors identified by the National Marine Fisheries Service (NMFS) as limiting the recovery of salmon populations in the Columbia River estuary (defined broadly as downstream of RM 146), wake stranding is considered a primary contributor to a low-priority factor (NMFS 2011). Although the magnitude of mortality caused by stranding is not fully understood, the information known about stranding risk and subyearling Chinook salmon life history and habitat use is useful for predicting the gross scale of the potential impacts on susceptible Chinook salmon populations:

- Wake stranding occurs on a small subset of non-contiguous shorelines in the vessel corridor not over a broad length of shoreline. Pearson et al. (2008) predicted that 16 percent or about 33 miles of non-contiguous beaches had some potential to strand fish. When additional criteria were included, Person et al. (2008) predicted that about 4 percent or about 8 miles of beaches had a high susceptibility to stranding.

- Stranding typically occurs at "hotspots" rather than across the whole length of a beach. Further, additional fine-scale morphological features, that control wave effects at the shoreline, appear to be necessary for there to be a stranding "hotspot" on a beach (Baursfeld, 1977; Pearson et al., 2006).
- Pearson et al. (2008) did not include fine-scale beach features as a criterion in evaluated the stranding risk at a particular beach. Coast and Harbor's (2016) study indicates that additional morphological features likely necessary for a beach to have a high risk of stranding.
- Overall, stranding "hotspots" could be very limited to small subset of beaches with numerous special physical characteristics.
- Stranding is episodic and happens when a number of factors co-occur when fish are present.
- The seasonal abundance of small Chinook salmon in shallow shoreline habitat varies by season as does the numbers of fish stranded (Pearson et al., 2006).
- Vessel wake behavior on the beaches is highly variable based on the characteristics of the vessel and its speed (Pearson et al., 2006).
- Stranding hotspots are determined by the morphological characteristics of the beach, not by the aggregation of the fish to a specific stranding-susceptible location or the quality of the fish habitat. This conclusion is based on the results of Pearson et al. (2006) where subyearling chinook were typically stranded at the "hotspot" even though sampling with a net showed the fish were distributed along all portions of the study site.
- Subyearling Chinook salmon present in the shallow water margin of the Columbia River are on a "rearing migration" continually moving downstream rather than holding in one location for months. This means that an individual fish is subject to stranding risk intermittently, not continually, on its path to the ocean. This distribution means the mortality contributed by wake stranding to a specific fish population is much less than if individual fish hold for extended periods in high stranding risk habitat.

Overall, existing information points to wake stranding being a focused and episodic contributor to mortality. Furthermore, wake stranding affects a life stage that is experiencing natural and typically high mortality at this point in the life history. After passing the potential stranding beaches, subyearling Chinook will enter the estuary (defined here narrowly as below River Mile 34) where many other factors (e.g., fish and bird predation, competition with other species in the estuary) will contribute to mortality. Finally, they enter the ocean where natural mortality rates are very high (e.g., 1 to 2 percent of outmigrants might survive to adulthood). Due to the natural high rate of mortality experienced by Chinook salmon after they pass the portions of the Columbia River where stranding occurs, it is not clear that stranding actually has a measureable effect on the total number of adult Chinook salmon returning to the river. All factors point to a relatively small impact on the Lower Columbia River and Upper Willamette River ESUs.

As ESA-listed salmon, Lower Columbia River and Upper Willamette River Chinook salmon are under the jurisdiction of the National Marine Fisheries Service (NMFS). NMFS has evaluated

the impacts of wake stranding on the Lower Columbia River ESU and the Upper Willamette River ESU in a number of ESA consultations supporting federal actions for several proposed projects including:

- 2002 Biological Opinion for the Columbia River Channel Improvements Project (NMFS 2002).
- 2005 Biological Opinion for the Columbia River Channel Improvements Project (NMFS 2005a).
- Biological Opinion for the Port of Kalama North Port Marine Terminal Expansion Project (NMFS 2005b).
- Biological Opinion for the Port of Longview Berth 9 Grain Terminal Facility Project (NMFS 2006).Biological Opinion for the Kinder Morgan Berth Deepenings at Linnton and Willbridge Terminals (NMFS 2010a).
- Biological Opinion for the Port of Kalama United Harvest Pier Modernization Project (NMFS 2010b).
- Biological Opinion for the Columbia Pacific Bio-Refinery Barge Dock Expansion (NMFS 2015).

In each case, NMFS concluded that wake standing contributes to early life mortality for these ESUs but that federal approval of each of the projects "would not jeopardize the continued existence" of ESA-listed species, including these two ESUs. Finally, the federal permitting process will include analysis of these types of impacts on ESA-listed species through the Section 7 consultation process.

Add historic/predictive vessel traffic levels analysis being prepared by DNV GL.

Section 5.8, Energy and Natural Resources

The impact analysis in the DEIS does not adequately consider the No Action Alternative.

Section 5.9, Environmental Health

The impact analysis in the DEIS does not adequately consider the No Action Alternative.

Section 5.9.2, Rail Transportation, pages 5-33 and 5-34

The DEIS states that:

> *The additional rail traffic associated with the Proposed Action in combination with existing and foreseeable future actions has the potential to increase the rate of accidents and fatalities to pedestrian trespass or motorists at at-grade crossings along the rail corridor since a greater number of trains would mean a greater number of potential conflicts. In addition, as discussed in Section 3.8, some at-grade crossings along the rail corridor may currently have elevated safety*

risks that would increase with additional train traffic. Therefore, cumulative impacts to environmental health from rail transportation are expected to be minor for many crossings but may be moderate for crossings with existing elevated safety risks.

First, this statement implies that the rate of accidents and fatalities is directly (or only) related to the volume of trains on the rail system[18]. The statement should be corrected to reflect studies that have evaluated the historical incidence of deaths and injuries associated with trespass and have concluded that factors, such as population increase, and demographic also strongly influence these rates (Savage, 2007)[19]. Additionally, EFSEC should consult with BNSF regarding information on rail accident rates in the context on rail traffic volumes. See also, our comments in Chapter 3 regarding rail crossing impacts and mitigation, in particular, comments to Section 3.14.

Section 5.9.3, Vessel Transportation, page 5-34, paragraph 1

This is addressed in Section 5.15, Transportation, below.

Section 5.10, Noise

The impact analysis in the DEIS does not adequately consider the No Action Alternative.

Section 5.10.3, Vessel Transportation, page 5-35, paragraph 3

The DEIS states that:

An increase in vessel trips in the Columbia River and along the Washington coast from vessels associated with the Proposed Action in combination with existing and foreseeable future vessel traffic could result in an increase in vessel-related noise (mostly transmitted by vessel engines) at receptors near these shipping routes.

This statement is unclear as to whether the noise levels are anticipated to increase, or if the frequency to exposure to noise is expected to increase (or both).

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[18] At Section 3.8.3.2 (page 3.8-15, second paragraph), the DEIS compares estimated actual train volumes to average historical *trespass* deaths within the portion of rail corridor to be used by Proposed Action trains. This section then concludes that the small increase in trains is not expected to increase the rate of historical accidents and fatalities related to "pedestrian trespass or motorists at most at-grade crossings" along the rail corridor. The DEIS uses a non-standard metric to assess incidence of trespass deaths (e.g., an incidence per million train miles would be more appropriate), and applies this rate to a conclusion regarding vehicle-train incidents at at-grade crossings. The EIS should use distinct rates for the two types of incidents.

[19] Savage, 2007. Trespassing on the Railroad, Railroad Economics - Research in Transportation Economics, Volume 20, p 199–224. Available at: http://faculty.wcas.northwestern.edu/~ipsavage/211.pdf. Accessed January 18, 2016.

The DEIS also states:

> *It is likely that recreational watercraft users present on the Columbia River in the vicinity of ship operations would be the most sensitive to increases in vessel noise since they would be located nearest to the vessels. Existing noise emissions from vessel traffic are already part of the noise background, although the increase in vessels from the Proposed Action in combination with future vessel traffic could be substantial in the future, depending on which projects are constructed and operated. Operational noise from the Proposed Action in combination with existing and foreseeable future actions is expected to result in cumulative noise impacts to recreational watercraft users and other nearby receptors.*

Regarding the last sentence, the DEIS does not state the significance level to which cumulative noise impacts would rise. Given that vessels would result in short-term pass-by noise increases, any noise events and subsequent impacts would be infrequent and limited in duration. Long-term (e.g., 24 hours) sound levels would be unlikely to increase by more than a minimal amount. Therefore, any noise impacts would not rise to the level of significance. The DEIS should state that. The DEIS also does not substantiate the specific effect that increased vessel traffic would have on background noise levels generally, or with respect to noise exposure by a recreational watercraft user or other nearby receptor.

Section 5.11, Land and Shoreline Use

The impact analysis in the DEIS does not adequately consider the No Action Alternative.

Section 5.12, Visual Resources/Aesthetics

The impact analysis in the DEIS does not adequately consider the No Action Alternative.

Section 5.13, Recreation

The impact analysis in the DEIS does not adequately consider the No Action Alternative.

Section 5.13.1, Proposed Facility, page 5-38

The DEIS notes that noise and visual impacts could be expected from hunters and other recreationists in close proximity, such as Shillapoo Wildlife Area, from impact pile driving and other construction activities. The DEIS fails to characterize the basis for these purported minor impacts. Additionally, the analysis fails to consider relative noise impacts during hunting season attributable to hunters' activities (e.g., shooting).

Section 5.13.2, Rail Transportation, page 5-38

The DEIS indicates that Wintler Park in the City of Vancouver is accessed by an at-grade crossing with no alternative access. The DEIS should be revised to reflect that an alternative access is available to Wintler Park that is not affected by at-grade crossing.

Section 5.13.3, Vessel Transportation, page 5-38

The DEIS notes minor to moderate noise and visual impacts to recreational watercraft users resulting from the Proposed Action in combination with existing and foreseeable future vessel traffic. The DEIS also identifies minor to moderate cumulative impacts to seasonal commercial/recreational fishing vessels. The DEIS references mitigation measures in Section 3.12.5 as addressing such impacts.

The mitigation measures as proposed in Section 3.12.5, which include financial contribution to boater educational efforts, are not warranted based on the minor impacts resulting from the Proposed Action. Nevertheless, as previously indicated, the Applicant would be willing to participate in Lower Columbia River Harbor Safety Committee efforts to develop additional boater safety educational outreach through programs, such as the PTP (Prevention Through People) model used by the San Francisco Harbor Safety Committee. This modified mitigation measure would address the cumulative impacts identified in this section of the DEIS.

Section 5.14, Historic and Cultural Resources

The impact analysis in the DEIS does not adequately consider the No Action Alternative.

Section 5.14.3, Vessel Transportation, page 5-39, paragraph 3

The DEIS inaccurately states that the Treaty Tribes have U&A areas or off-reservation fishing rights in the Columbia River in the vicinity of, or downstream from, the project. The Treaty Tribes exercise their treaty fishing rights upstream of or immediately adjacent to Bonneville Dam, pursuant to court orders in the U.S. v. Oregon treaty fishing rights litigation. See comments on Section 3.1.3. The Grand Ronde, a non-treaty tribe the DEIS suggests has off-reservation fishing rights in the Columbia River, has no treaty fishing right, and maintains only a privilege to fish in the waters as would any U.S. citizen. That privilege is subject to limitation based on the interests of the state.

The DEIS also misstates the cumulative impacts of an increase in large vessel traffic on tribal fishing rights. The DEIS notes that because tribal fishing vessels must yield to larger vessels on the Columbia River, the increased large vessel traffic will have a moderate cumulative impact on tribal access to U&A areas on the Columbia River. As noted previously, however, there are no adjudicated U&A places in the vicinity of, or downstream from, the Facility.

Moreover, even if the tribes use the river in that reach to access U&A places, the cumulative impacts from the project are minimal at most. The Columbia River is an industrial waterway with significant “large” vessel traffic. The Proposed Action will add one vessel entry transit, daily. Proposed Action vessel entry transits will not exceed 365. As noted in the comments to Section 5.1.3 above, other proposed projects may add transits, while cargo transits are likely to decrease due to changing market conditions. The projected vessel traffic in the river from the Proposed Action and other proposed projects are well within the river’s traffic capacity to allow

all transiting vessels to operate within the river and use its resources, including for tribal fishing and transit purposes, as indicated in the DEIS, and in the comment to Section 5.15.3.

The DEIS also states that impacts to aquatic species have the potential to reduce localized populations of important tribal species fish, such as salmon; however, that statement is based on an inaccurate description of the areas in the river where wake impacts on fish are present, and the localized populations of species important to the tribes at those specific locations. See Attachments 3-1 and 3-2, and comments to Section 5.7.3.

Section 5.15, Transportation

The impact analysis does not adequately consider the No Action Alternative or complete the analysis necessary to directly attribute any purported impact to the Proposed Action, as distinguished from baseline conditions and non-Facility impacts. As recognized in various sections of Chapters 3 and 5 of the DEIS, the rail and vessel corridors are well established and have been in use for long periods of time. The analysis and recommendation do not acknowledge that existing rail and vessel traffic will continue and non-project-related increases in rail and vessel traffic will occur consistent with state (and federal in the case of vessel traffic) projections.

Accordingly, rail traffic associated with this Facility should not be considered "additional" rail traffic because the railroad is a "common carrier" and maximizes the capacity of its rail lines to serve a variety of customers, and growth in rail traffic would occur under the No Action Alternative. The trains associated with this Facility are part of a natural fluctuation in rail traffic. The rail traffic associated with the Proposed Action does not represent an increase in traffic from the No Action Alternative and any purported impacts are not attributable to this project. See additional comments on the No Action Alternative in Section 2.8.2.5.

Similarly, as noted in the comment to Section 5.15.3 below and Table 5-2 above, the DEIS bases its analysis on overly conservative assumptions regarding future vessel traffic growth. Please also refer to Attachments 4-3 and 4-4.

Section 5.15.1, Proposed Facility, page 5-40, paragraph 1

The Applicant concurs in the statements on no substantial changes in levels of service and that any impacts would be temporary and minor.

Section 5.15.2, Rail Transportation, page 5-41, paragraph 1 (Cumulative Impacts)

Although additional detail on cumulative rail transportation is included in Section 5.1.3.2 to some extent, the conclusion that rail facilities would "*likely reach or exceed capacity in some areas*" and that the impact would be "*moderate to major*" lacks support. See for example the PDEIS at Section 7.3.15.2 (Table 7.3-7), where the Proposed Action related to trains were compared to predicted future rail utilization and based on studies cited in the DEIS.

This conclusion also ignores the statements made elsewhere (in the PDEIS, as well as in the reports cited to in the DEIS) that the Class I railroads have and will make improvements and modifications necessary to address capacity, as the DEIS states:

> *In addition, the Class I railroads (BNSF and Union Pacific) and other key stakeholders are expected to address capacity issues as they emerge (WSDOT 2014a).*

Furthermore, the DEIS does not present data upon which the determination that capacity might be exceeded has been made. See for example the information presented at Section 7.3.15.2 of the PDEIS, which identified what the rail capacity would be at project build-out, the number of additional rail trips from other cumulative projects on each segment, and the relationship of rail demand to rail capacity along rail segments. BNSF has consistently stated and demonstrated that it makes operational and capacity infrastructure improvements it deems necessary to respond to increases in rail traffic. EFSEC should consult further with BNSF on this topic.

Section 5.15.2, Rail Transportation, page 5-41, paragraph 2

There is an internal text discrepancy or error in Chapter 5: Cumulative Impacts. The text on page 5-41 should be updated to match or at least not conflict with the text and values in Section 3.14.3.2. Table 3.14-14 (DEIS page 3.14-25) presents the incremental additional delay per crossing per day caused by trains associated with the proposed Facility along the Columbia River Alignment. As shown, gate downtime would be increased by between 15 and 26 percent along the Columbia River Alignment.

However the text at page 5-41 states:

> *"Rail transportation associated with the Proposed Action would increase gate downtime delay by between 13 and 17 percent, and future train traffic could further increase gate downtime."*

Section 5.15.2, Rail Transportation, page 5-41, paragraph 2

Please see the comment to Section 3.14.3.2, page 3.14-28, requesting the source for the reference cited as "WSDOT."

Section 5.15.3, Vessel Transportation, page 5-41, paragraph 3

The DEIS predicts a large increase of vessel traffic on the river in the future. This does not align with the DNV GL–Worley Parsons study conducted in 2015. The DEIS estimates 4,000 to 5,400 calls per year in the future; the DNV GL–Worley Parsons report estimates 3,600. See also the additional comments to Section 5.1.3 regarding errors in the assessment of cumulative vessel traffic.

Section 5.15.3 states:

> *The Proposed Action in combination with vessel traffic associated with existing and foreseeable future actions would increase the number of deep-draft vessels using the Columbia River*

navigation channel from the baseline of 1,457 deep-draft vessel transits in 2013 to an unknown number in the future. The number of vessels that could use the Columbia River navigation channel would depend on which projects are permitted, constructed, and operated. The total number of vessels that could be added to the Columbia River including baseline traffic (2013) and vessel traffic associated with the Proposed Action and future actions is between approximately 4,067 and 5,405 vessels per year. This amount would significantly exceed the recent historical high of 2,086 vessel trips that occurred in 2000.

The DEIS appears to have made two errors in calculating the potential increases in vessel traffic. First, it appears to mix trips (a trip consists of two transits, an entry and exit), total transits and entry transits. For example the VEAT data (1,457 transits in 2013) is reported in entry transits. In the case of Millennium Bulk Terminals, the DEIS (Table 5-2) reports the project as involving 1680 vessels per year. This reflects both entry and exit transits and to properly compare to the baseline, either the baseline needs to be doubled or the 1,680 vessels divided by two to only reflect entry transits. Second, the additional vessel traffic contains some incorrect information. For example the DEIS (Table 5-2) lists the Kalama Manufacturing and Marine Export Facility as having 104 to 728 vessels per year. This grossly overstates the number of vessel trips by approximately 580. The Applicant has provided additional information on these errors in our comments on Section 5.1.3.

The DNV GL Quantitative Vessel Traffic Risk Assessment used the assumption that every proposed project will be fully operational at some point in the future, despite that some of the projects are currently cancelled or unable to move forward. All projects listed in Table 4-1[20] were used in determining incident frequencies for marine transport; therefore, the volume of proposed traffic in the DNV GL study is likely overstated.

The ship numbers should clearly distinguish between "*trips*" and "*transits*." Currently, they are used interchangeably. A "*trip*" involves two transits – one up-river and one down-river. The following DEIS discussion should be revised as shown:

The Proposed Action in combination with vessel traffic associated with existing and foreseeable future actions would increase the number of deep-draft vessels using the Columbia River navigation channel from the baseline of 1,457 deep-draft entry vessel transits in 2013 to an unknown number in the future. The number of deep-draft vessels that could use the Columbia River navigation channel would depend on which projects are permitted, constructed, and operated. The total number of vessels that could be added to the Columbia River including baseline traffic (2013) and vessel traffic associated with the Proposed Action and future actions is between approximately ~~4,067 and 5,405~~ 3,039 and 3,189 entry vessel transits per year. This amount would ~~significantly~~ exceed the recent historical high of 2,086 entry vessel ~~trips~~ transits that occurred in 2000. Increased traffic from vessels associated with the Proposed Action, in addition to that associated with existing and foreseeable future actions, would result in an

[20] Taken from BergerABAM, Memorandum: Columbia River Anticipated Vessel Traffic, February 11, 2015. A copy is in Appendix C to the DNV GL report.

> *increased demand for pilot resources and in the ability to accommodate all demands from vessel traffic. However, the pilots indicate that the number of available pilots and current vessel management systems are sufficient to handle the anticipated growth (Worley Parsons 2014).*

Section 5.15.3, Vessels, pages 5-41 to 5-42, first full paragraph

The DEIS indicates that the cumulative impacts for additional vessel traffic could range from slightly higher than historical high to well beyond that level and that congestion could occur unless system improvements or operational adjustments are made. The DEIS does not provide any information supporting its conclusions regarding congestion. When discussing potential ship volumes, the DEIS also appears to use both trips and transits without specifying detail on what is meant by these terms (see the comments relative to Table 5-2 above).

Section 5.16, Public Services and Utilities

The impact analysis in the DEIS does not adequately consider the No Action Alternative.

Section 5.17, Socioeconomics

The impact analysis in the DEIS does not adequately consider the No Action Alternative.

Section 5.18, Greenhouse Gases and Climate Change

Section 5.18.1, Life-cycle GHG emissions resulting from receipt of diluted bitumen, page 5-49, paragraph 2

As previously indicated, the DEIS failed to address the cumulative impacts of the No Action Alternative. Section 5.18 should be revised to include such a discussion. At Section 5.18.1, the authors acknowledge that some or all of the crude oil transported through the Facility would replace existing supplies to refineries:

> *Again, this does not indicate that there would be a 0.9 percent increase in US or 0.1 percent increase to worldwide GHG emissions since some or all of the crude oil transported through the proposed Facility would replace existing supplies.*

Under the No Action Alternative, the demand for mid-continent crude oil by West Coast refineries would not decrease. West Coast refineries would continue to rely on existing or new facilities that would allow the trans-shipment of crude oil. As discussed in the comment to Section 1.6 (and described in detail in Section 1.3 in the PDEIS), PADD 5 refineries are limited in the means by which they can receive mid-continent crude, and especially crude oil from the Bakken region. Refineries would continue to receive crude oil from existing sources, including domestic sources connected to existing overland transportation systems capable of moving the crude oil to the West Coast, the Alaska North Slope, and foreign sources.

On a broader geographic scale, as presented in Section 7.5.2 of the PDEIS:

> *…refineries in PADD 5 would be required to source more foreign crude oil to replace declining domestic Alaskan and Californian production. Vessel deliveries of crude oil from foreign nations would increase, and with them cumulative impacts related to marine vessel transportation of crude oil on the open ocean. Vessels would arrive at existing ports and terminals, with more foreign vessel arrivals than U.S. flagged vessels. Imports by pipeline from Canada would continue. Impacts of extraction of crude oil would occur in foreign locations, and could increase in relationship to PADD 5 demand for foreign crudes.*
>
> *Crude oil would still be extracted domestically, but it would be shipped to other U.S. markets, incurring the transportation related impacts in those areas instead of on the West Coast.*

Appendix A to the PDEIS presented established data regarding the life-cycle greenhouse gas (GHG) impacts associated with crude oil both within the United States and internationally. For example:

> *Recently, GHG emissions life-cycle analyses have specifically studied the influence of incorporating crude oils extracted from unconventional North American oil resources into U.S. refinery slates. The U.S. Department of State (USDOS) and others evaluated the change in U.S. refinery slate to determine just how different the average crude oil blend being fed to U.S. refineries may have changed since 2005, the baseline year for the NETL analyses (IHS 2014, USDOS 2013). The studies concluded that, although the share of light oils produced domestically has increased in the average U.S. slate and has displaced foreign imports, the average quality of the mix has not materially changed. With respect to crude oil produced from newer shale plays, estimates have indicated that life-cycle emissions can vary substantially by play. More recent estimates have indicated that because of flaring practices and lack of infrastructure, extraction emissions in the Bakken play may be higher than those in the Eagle Ford play for example (IHS 2014). However, because of their intrinsic light and sweet qualities, shale oils are recognized as easier to refine, resulting in 7 to 9 percent fewer refining GHG emissions compared to a 2011 baseline (as cited to in IHS 2014, USDOS 2013). Overall, incorporation of lighter crude oil could result in similar or lower GHG life-cycle emissions depending on the amount of light crudes added to the average U.S. refinery slate (IHS 2014, MathPro 2013).*
>
> *As part of its review of the proposed Keystone XL pipeline, USDOS determined that, compared with other reference crudes that supply U.S. Gulf Coast Refineries (Mexican, Venezuelan, and Middle Eastern sour crudes), the Western Canadian Sedimentary Basin oil sands are likely to have higher life-cycle GHG emissions on a standalone basis; however, the overall impacts to overall average U.S. GHG emissions resulting from incorporating these crudes are anticipated to be rather small (USDOS 2013).*

The data supports the conclusion that GHG emissions resulting from the No Action Alternative are likely, if not certain, to be similar to those of the Proposed Action. The Carbon Intensity (CI) value for Bakken Crude published by CARB in their Carbon Intensity lookup table for crude oil

production and transport is 10.18 gCO2e/MJ.[21] The California baseline crude average applicable to crudes supplied to California is 11.98 gCO2e/MJ. The weighted CI of crudes refined in Washington State in 2012 was 13.9 gCO2e/MJ as determined by Life Cycle Associates in their 2014 report prepared for the Washington Department of Ecology.[22]

Section 5.18.1, Life-cycle GHG emissions resulting from receipt of diluted bitumen, page 5-49, paragraph 1 and Table 5-10

Section 5.18.1 of the DEIS should be revised to reflect that the Facility is not designed to receive, store, and handle 360,000 barrels (bbl) per day of heavy crude. As such, "worst case" scenario life-cycle GHG emission calculations based on heavy oil received (versus all Bakken crude) and handled at the facility should be recalculated accordingly.

Table 5.10 presents the Life-Cycle GHG Emissions for Liquid Fuels Production of 360,000 bbl per Day Canadian Oil Sands (metric-ton CO2e/year). The data presented in this table are based on EFSEC's worst-case assumption that:

> *Using the unlikely scenario that all crude oil handled at the proposed Facility would be sourced from Canadian oil sands (i.e., bitumen), Table 5-10 calculates the worst-case GHG emissions for the five lifecycle stages in units of metric tons per year based on the three main petroleum products that would ultimately be refined from the 360,000 bbl per day.*

First the statement should be corrected to remove the term "*bitumen.*" As stated in the PDEIS at Section 2.3.12, page 2-60, the Facility is designed to only accept pipeline quality crude:

> *…Construction of the potentially deferred elements would not add receipt capacity on a daily basis; construction of the potentially deferred elements would allow the Facility to receive and handle different crude qualities (i.e., lower API pipeline quality crudes that require heating for transfer operations), and additional capability to segregate crudes for different clients.…*
>
> *- Four storage tanks designed to handle non-heated pipeline quality crude page :…*

Although "*bitumen*" in its natural state may be extracted at the source, unless it is diluted to "*Pipeline quality*" it is too viscous to be handled at the Facility. As stated in materials submitted to EFSEC, the Applicant proposes to handle light and heavy crude oils with an API gravity ranging from 15 to 45. Oils with lower API are not exclusively sourced from the Canadian Oil sands.

The Facility is not designed to accept 100 percent delivery oils with a lower API, which may need heating to assist in transloading. The Facility design does not provide the capacity to heat four trains per day to allow product to flow at the desired unloading rate unimpeded. First, 60 of the 90 product unloading stations have no heating capability. Heating crude oil is needed

[21] California Low Carbon Fuel Standard Adopted November 2015.

[22] Pont, Jennifer, Stefan Unnasch, Michael Lawrence, and Scott Williamson. 2014. A Clean Fuel Standard in Washington State, Revised Analysis with Updated Assumptions. Final Report: LCA 8056.98.2014. December 12, 2014.

to maintain temperature in the lower API crudes between 100 to 150°F to ensure the product flows at the rate needed to get the overall throughput into the facility. The Area 600 boilers are sized to heat 1 to 1.5 trains a day based on temperature of the crude oil being delivered and ambient temperatures. The piping from Area 200 (unloading) to Area 300 (tank storage) has a single insulated and heated line. Lower API crude needs to maintain temperature or it will start to solidify and restrict flow through the piping. Finally, only two of six of the Area 300 tanks will be fitted with heaters as described in Section 2.2.24 of the DEIS.

Life-cycle GHG emissions for lower API oils should be based upon these design constraints.

Section 5.18.3, Potential PADD 5 Refinery Changes, page 5-52, paragraph 3

The DEIS makes several incorrect statements regarding refinery expansions, upgrades, and their relationship to creating new rail infrastructure to receive domestically sourced crude oil. These statements should be corrected as indicated below.

> *Proposed or planned refinery expansions and upgrades in PADD 5 include:…*
>
> *… None of these proposed expansions/modifications involve increasing the volume of crude oil to be refined and none have yet been successfully permitted, so it is not known if any or all of the proposed expansions would occur. Regardless, three of the above five refinery expansions/modifications involve creating new rail infrastructure that would allow these refineries to obtain domestically produced crude oil from locations other than the proposed Facility. However, even if these proposed expansions are permitted, they would likely occur regardless of whether the Proposed Action is constructed and operated. … …*

The statements are contradictory—a bulleted list is presented purporting refinery expansions, and then a statement is made concluding the opposite. The delivery of crude oil by rail to Tesoro's Anacortes refinery has nothing to do with that refinery's Xylenes project. The delivery of crude oil by rail to the Shell Puget Sound Refinery also has nothing to do with a purported refinery expansion, as no expansion has been proposed or permitted. The creation of "*new rail infrastructure*" should also be placed into context – in most of these cases, the new rail infrastructure involves short spurs to allow connection to exiting mainlines. As noted in the comment to Section 5-2, the references cited regarding the Chevron Burnaby Refinery do not indicate any crude oil is being received from the United States; furthermore, the references provided do not demonstrate that the refinery is undergoing an expansion, rather "upgrades are proposed to allow refining of heavier crude oil." The final sentence of the excerpt above is also contradictory in that most of bulleted proposals are not refinery expansions to start with. Also, although the proponents have begun permitting the projects, until such time the projects are constructed one cannot conclude the proponents "*will go through with them;*" it may be possible that even if permitted, they may not be constructed, and they could chose to source crude delivered by marine vessel to their terminals through the Proposed Action.

Section 5.18.4, Potential for Export of Crude Oil, page 5-53, paragraph 2

The DEIS indicates that generally the export of crude oil produced domestically cannot be exported. This section should be updated to reflect the recent lifting of the ban by Congress. However, lifting of the ban would not change the impacts of the Proposed Action.

Section 5.19, Risk of Accidents

Finally, the impact analysis in the DEIS does not adequately consider the No Action Alternative or complete the analysis necessary to directly attribute any purported impact to the Proposed Action (Facility or transportation related), as distinguished from baseline conditions and non-Facility impacts. With respect to rail and vessel traffic, crude oil would continue to be transported within the same corridors, and risks associated with such transportation would still be present.

Section 5.19.2, Rail Transportation, page 5-44

Please refer to comments regarding the rail risk analysis (Chapter 4 of the DEIS), and to Attachment 4-2.

Section 5.19.3, Vessel Transportation, page 5-44, paragraph 1

Please see the comment to Section 4.3.7 (page 4-18 of the DEIS) regarding Maritime Fire and Safety Association's (MFSA) testimony that the MFSA Vessel Contingency Plan would be amended to provide additional resources necessary to cover vessels carrying crude oil in excess of the current planning standard and for the additional types of petroleum commodities anticipated.

Section 5.19.3, Vessel Transportation, page 5-44, paragraph 3

The DEIS evaluates cumulative impacts from vessel transportation as a general discussion. The analysis is not based on a complete and thorough risk assessment. As described in comments to Chapter 4, a meaningful statistical analysis of potential vessel incidents, including those that result in spill, is possible and should be the basis for reaching conclusions regarding whether an impact is "significant" under SEPA.

To refine the qualitative marine vessel transport risk assessments that the Applicant provided in the PDEIS, the Applicant retained DNV GL to conduct a more thorough quantitative assessment of marine vessel transportation risks (DNV GL, 2016). A copy of that assessment is attached to this DEIS comment letter and is explained in more detail later in our comments to Chapter 4. These reports should be incorporated into the FEIS for a more complete assessment of the risk of collision.

Section 6.2 presents the frequency of the five types of navigation incidents given the future traffic assumptions in the study. The study estimated an average of 44 to 45 events per year on the river, the majority of which would be powered groundings. For Vancouver Energy-related tankers, the study estimated 1.7 events per year (with or without consequences of concern), representing an increase of 3.8 percent.

Not all marine incidents result in a crude oil spill. MARCS estimated a fraction of these incidents would result in the spilling of any cargo. The DNV GL study concludes that the frequency of an incident resulting in a spill of any kind to be 1 in every 16.1 years assuming future marine traffic.

COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR VANCOUVER ENERGY

NOTE: The following comments to the DEIS appendices focus on issues and comments that are unique to the appendices. To the extent that a comment or issue with the appendix has been previously addressed in Applicant's comments to substantive DEIS chapters, those comments are not repeated here.

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Appendix B: Fire Protection Assessment Report

Section 2.1, Facility Area 200 Rail Unloading, page 2-1, bullet 1
Section 2.2, Facility Area 300 Storage Tanks, page 2-2, bullet 5
Section 2.3, Facility Area 400 Marine Terminal, page 2-2, bullet 6

The Environmental Impact Statement (EIS) should clarify that the Applicant commits to reviewing the electrical hazard classification areas based on final Facility design. Further, these classification areas will be evaluated in compliance with applicable National Fire Protection Association (NFPA) standards as detailed below.

At the Executive Summary to Appendix B, the Draft EIS (DEIS) indicates that specific electrical hazard classification boundaries for Areas 200, 300, and 400 need to be confirmed for compliance with Class I, Division 1, and Davison 2 installation requirements.

As stated in the documentation submitted to Energy Facility Site Evaluation Council (EFSEC), "A complete electrical hazard classification analysis was performed for all project areas. This hazard classification was performed by Intermountain Consumer Professional Engineers, Inc. The drawings of the hazard classification areas were utilized in the design process. The electrical classification impacts the type and classification of devices and circuitry to be used for each area.[1]" Further, EFSEC's consultant agreed in concept with the preliminary classification areas as stated in Appendix A to Appendix B of the DEIS (see Appendix A: Section 2.1, page 2, bullet 6; Section 2,2, page 3, bullet 7; and Section 2.3, page 5, bullet 4).

The Applicant agrees that as the design drawings are refined the electrical hazard classified areas will also be further evaluated to confirm the compliance with Class I, Division 1, and Division 2 environments. The Design Team and Applicant are in full support of properly identifying the electrical hazard classification areas to ensure that properly classified electrical equipment is used in these areas.

The electrical hazard classification areas will be further evaluated in accordance with the Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas[2].

The corresponding discussion in Appendix A (to Appendix B), Sections 2.1, 2.2 and 2.3, should also be revised accordingly.

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[1] See Pool Fire Protection. 2014. Fire System Operation Description, Vancouver Energy, Vancouver, Washington, February 26, 2014, as cited in Appendix A to DEIS Appendix B

[2] National Fire Protection Association (NFPA), NFPA 497, Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas, 2012 Edition

Section 2.1, Facility Area 200 – Rail Unloading, page 2-1, bullet 3

The statement in the DEIS recommending that a second detection system should be provided to activate alarms prior to actual foam release, and to provide fire detection in areas not protected/covered by linear heat detection in Area 200, should be removed.

The 30 percent design fire alarm system design drawings[3] (Sheets 0200-FA-001, 0200-FA-002 (Sequence of Events) and 0200-FP-003, clearly reflects that manual foam release stations are to be provided throughout Unloading Building, which will also activate the alarms and the foam suppression system. Furthermore, H2S, LEL, and O2 gas detection will be provided in the pump basins of the Railcar Unloading Building. H2S and LEL detection will be provided at each unloading station in the Railcar Unloading Building near grade. These gas detectors will be connected to the fire alarm system so they can be monitored. Upon activation of the linear detection, a manual foam release station or any one of the gas detectors, an audible alarm will sound. This is also clearly documented in the Fire Protection Basis of Design Engineering Evaluation Report.

Because the Unloading Building is already provided with multiple methods to activate the foam suppression system (linear detection and manual release stations), and gas detection is also being provided to initiate alarm, another method of detection is not necessary to meet applicable fire protection standards. These detection methods and system activate methods exceed what is required by the applicable codes and standards (International Building Code [IBC], NFPA 13, and NFPA 72) for a facility such as this. Linear detection is not required, as the system could be designed as a dry-pipe system without linear detection, manual release stations, or the gas detection.

The corresponding discussion in Appendix A (of Appendix B to the DEIS), Section 2.1 Area 200 – Rail Car Offloading Area and Office, should also be revised accordingly.

Section 2.2, Facility Area 300 – Storage Area, page 2-2, bullet 2

The statement in the DEIS recommending that additional clarification is needed to confirm the operation of the dike monitor locations should be removed.

The 30 percent design fire protection system design drawings (Sheet 0300-FP-002), and the Fire Protection Basis of Design Engineering Evaluation Report clearly explain that fire hydrants will be located on the dike spaced every 300 feet along with two fire hydrants located inside the dike area near the intersection of the intermediate dikes. They further explain that each hydrant will be equipped with a monitor nozzle and foam eductor capable of reaching the neighboring tank of the one in incident. The flow of water from these monitor nozzles are provided to create a cooling effect on the tank wall. The foam eductor provided on each monitor nozzles will allow

[3] See BergerABAM. 2015. Response to EFSEC Draft EIS Data Request 3, February 26, 2015. As cited in Appendix B to the DEIS.

the hydrant to spray a foam water solution and control a small pool fire within the dike area. A predetermined size of foam concentrate stored in bucket, pale, or other portable device will be kept in the Fire Pump and Foam Building. When the need arises for its use, such as a small spill or rubbish fire, the foam concentrate will be taken to the appropriate fire hydrant and the hose placed in the bucket. The nozzle will draw the foam in at the manufacturer determined proportioning rate to achieve the desired concentration. The monitor nozzles will be pre-aimed at the respective tank, but the fire hydrant valve will have to be manually opened to initiate water or foam-solution flow through the monitor nozzle and then the monitor nozzles can then be adjusted and directly to flow water or the foam-solution to the desired point, manually.

Even though the design drawings reflect the location of the fire hydrants with monitors, as the design further develops specific water spray drawings will be developed to clearly reflect the projected area of coverage for each monitor. These drawings will clearly reflect the coverage area of the diked area and the wetting/cooling effect of the tanks from the monitors.

The corresponding discussion in Appendix A (to Appendix B of the DEIS), Section 2.2, Area 300 – Storage Area, should also be revised accordingly

Section 2.1, Facility Area 300 – Storage Area, page 2-2, bullet 4

The statement in the DEIS recommending that additional fire detection systems should be provided to monitor and alarm tank external areas should be removed.

The 30 percent design fire alarm system design drawings submitted to EFSEC (Sheets 0300-FA-001, 0300-FP-002) clearly reflect that manual foam release stations and linear heat detection is provided to activate the foam suppression system for each respective oil storage tank. Upon activation of the linear detection or a manual foam release station, an audible alarm will sound and foam will be discharged to the foam makers for the respective tank to provide foam at the foam dam to control and extinguish the fire. This is also clearly documented in the Fire Protection Basis of Design Engineering Evaluation Report.

Upon automatic activation of the linear heat detection or manual activation of the manual foam release stations the alarm signal will be transmitted to a constantly attended location. Gas detectors are also provided in the pump basins that are also connected to the fire alarm system to initiate an alarm signal. Additionally, if a fire hydrant/monitor nozzle is operated, the 2,500-gpm diesel driven fire pump will automatically start, at which time an alarm will be activated via the fire alarm system for the tank storage area.

Because the Storage Area is already provided with multiple methods to activate the foam suppression system (linear detection and manual release stations), and gas detection is also being provided to initiate alarm, another method of detection is not necessary. These detection methods and system activate methods exceed what is required by the applicable codes (IBC, International Fire Code [IFC], and NFPA 30) and standards for a facility such as this.

The corresponding discussion in Appendix A(to Appendix B of the DEIS), Section 2.2 Area 300 - Storage Area, should also be revised accordingly

Section 2.3, Facility Area 400 – Marine Terminal, page 2-2, bullet 1

The statement in the DEIS recommending that the foam monitor details for the Marine Terminal needs to be revised to reflect the proper height for the draft range expected for the vessels should be revised or removed to reflect that sufficient height has been anticipated, as described below.

The 30 percent design fire protection system design drawings (Sheet 0400-FP-002, Detail 2) and the Fire Protection Basis of Design Engineering Evaluation Report clearly reflect the location and height of the two remote-controlled elevated monitor nozzles. The nozzles are proposed to be 10 feet above the surface of the deck. These two remote controlled elevated monitor nozzles will be provided on the dock for firefighting purposes for a fire on the dock or a fire at the connections to the vessel. These monitor nozzles will be supplied from the Fire Pump and Foam Building with foam-water solution. Activation of these foam-water monitor nozzles will be by manual foam release stations located in the E-house, located shore side.

The nozzles have been elevated 10 feet above the dock to prevent obstructions from blocking the effective reach of the nozzle. The monitor nozzle system has been designed to account for a fire on the dock or a fire at the connections to the vessel. The monitors have not been designed to provide protection for the entire vessel. Each nozzle will be designed to flow 750 gpm for a total demand of 1,500 gpm with a 500-gpm hose allowance for the fire department shore side, taking into consideration the recommendations of NFPA 30, Appendix 29.3.28. The diesel-driven fire pump serving the Marine Terminal has a design flow rate of 2,000 gpm at 125 psi.

Even though the design drawings reflect the location of the monitors, as the design further develops specific water spray drawings will be developed to clearly reflect the projected area of coverage for each monitor to confirm the elevation of the monitor is at the correct height to be able to accommodate the draft range expected of the vessels.

The corresponding discussion in Appendix A (to Appendix B of the DEIS), Section 2.3, Area 400 Marine Terminal, should also be revised accordingly

Section 2.3, Facility Area 400 – Marine Terminal, page 2-2, bullet 2

The second bullet reading "*Provide locations of the manual release points, including some to be located on shore*." should be removed, as the information has been provided to EFSEC as indicated below.

The Applicant is not clear on what a "Manual Release Point" is as it relates to fire protection. However, the Applicant interprets it to represent the manual activation station of the elevated

foam monitor nozzles, these manual activation stations have been clearly reflected in the 30 percent design fire protection system design drawings (Sheets 0400-FAP-001 and 0400-FA-003) and the Fire Protection Basis of Design Engineering Evaluation Report. The foam manual activation/release stations will be located in the E-house on shore side, near each monitor nozzle, near the bottom of the tower stair and on the upper crane platform. The monitors are able to be remote controlled from the controls in the E-house.

If the intent of the comment is referring to mooring "*manual release points*," this was not a component of the fire protection system or overall fire protection evaluation; therefore, can be addressed by other representatives of the Design Team and the Applicant.

The corresponding discussions in Appendix A (to Appendix B of the DEIS), Section 2.3 (page 5) and Section 4.3 (page 3: "*The monitor nozzles on the dock would activate when a manual release station has been activated. Manual release stations would be provided strategically on the dock and shore side at the fire pump and foam building*.") should also be revised accordingly.

Section 2.3, Facility Area 400 – Marine Terminal, page 2-2, bullet 3

The following statement should be removed from Appendix B:

> *Provide spill containment at the dock in addition to the floating boom for the vessels, including curbing around the platform, all-welded (no flanges) oil piping over the water, and a slop tank.*

The spill containment discussion in the Fire Protection Basis of Design Engineering Evaluation Report was intended as contextual overview and does not represent a comprehensive description of all of the containment measures proposed by the Applicant. These have been described elsewhere in the DEIS, and in much more specificity in the Applicant's spill prevention, control, countermeasure and contingency plans. See Appendices D3 and D4 for example.

As described elsewhere, the Applicant has proposed:

- That all piping be fully welded per U.S. Coast Guard regulations and industry standards (See PDEIS, Section 2.3.1.4 "Piping would be installed and field welded. Field welds would be inspected per applicable specifications (API Specification 5L).") See also Section 4.2.4.1 of the DEIS, page 4-6.

- Flanges will be located at transitions from pipe to valve or at hose connections (see PDEIS page 4-321: "*Marine Terminal loading hoses and their supporting equipment would be designed to meet the applicable hose protection requirements of WAC 173-180 Part B and 33 CFR 156.* ", and "*All piping located over water would be welded and would not contain any mechanical joints*."

- "*A catchment area at or below the deck level in the marine terminal would have a 3 bbl holding capacity. The contents of the containment would be discharged within 1 hour of completion of any*

transfer by pumping into either the return pipeline or a tank truck for disposal." (DEIS at page 2-50)

The Fire Protection Basis of Design Engineering Evaluation Report clearly identifies the safety and fire protection measures to be included that are intended to enhance the fire protection measure at the marine terminal. These safety and fire protection measures include automatic shutoff valves, a return and stripping line for the crude to return back to the storage tanks, a marine vapor combustion unit, and manual fire protection features, including the elevated remote controlled foam monitors.

The corresponding discussion in Appendix A (to Appendix B of the DEIS), Section 2.3 (page 5) should also be revised accordingly.

Section 2.3, Facility Area 400 – Marine Terminal, page 2-2, bullet 5

The DEIS recommends that clarification be provided on whether the fire flow capacity is adequate considering comparable California standards (CA MOTEMS Chapter 31F, Section 8), which requires 3,000 gallons per minute (gpm) fire flow for this terminal. This statement should be removed or revised to reflect that California standards are not applicable in the State of Washington and that the proposed design provides in excess of 3,000 gpm fire flow for the marine terminal in Area 400.

It is not clear to the Applicant why California standards are referenced and used in the review presented in the DEIS, as the Facility is located in the State of Washington where no such requirements have been adopted or is otherwise applicable.

The Fire Protection Basis of Design Engineering Evaluation Report (Section 5.3) and the Fire Suppression Hydraulic Analysis clearly identify the available water supply to the fire pump at the marine terminal area. Based on the flow test performed, the static pressure is 81 psi, with a residual pressure of 62 psi while flowing 2,127 gpm. Based on this flow test, the available flow at 20 psi would be 3,995 gpm, which is well in excess of 3,000 gpm; therefore, a vertical submersible river pump will not be required.

As reflected in the Fire Protection Basis of Design Engineering Evaluation Report (Section 5.3) and the Fire Suppression Hydraulic Analysis, the monitor nozzle system has been designed to provide protection for the entire vessel. Each nozzle will be designed to flow 750 gpm for a total demand of 1,500 gpm with a 500 gpm hose allowance for the fire department shore side. The diesel driven fire pump serving the marine terminal has a design flow rate of 2,000 gpm at 125 psi.

The fire flow and system demand calculations have been performed in accordance with the guidelines from the IBC, the IFC, and the applicable NFPA codes and standards, such as NFPA 13, NFPA 15, and NFPA 16. The IBC and IFC specifically reference these NFPA codes and standards for performing system design, and the respective NFPA code and standard

document the process to be used to determine the required fire flow calculations. These fire flow calculations determine the overall fire protection system demand, which is then compared to the available water supply from the City to confirm the water supply system can meet the system demand.

City water supply is, therefore, more than adequate to meet the required fire protection system demand.

The corresponding discussion in Appendix A (to Appendix B of the DEIS), Section 2.3 (page 5) should also be revised accordingly.

Section 2.3, Facility Area 400 – Marine Terminal, page 2-2, bullet 6

The DEIS requests that the type, location, and function of the fire detection be provided for the marine terminal area. As described below, this information has been provided. The EIS should incorporate consideration of this information and revise or remove the statement at page 2-2.

The 30 percent design fire alarm system design drawings (Sheets 0400-FA-001, 0400-FA-003), clearly reflects that the only automatic detection at the marine terminal area are the smoke detectors above the fire alarm panel in the control room on shore side and in the fire pump house. The activation of the remote controlled elevated monitor nozzles are by manual activation only. Manual foam release stations will initiate the activation of the foam monitor nozzle system and provide an audible notification alarm in the area via external horns or speakers and an alarm signal will also be automatically transmitted to a constantly attended location so the fire department can be notified.

Additional automatic detection or automatic activation of the foam system at the marine terminal is not justified because the control room will be staffed at all times while vessels are being loaded.

Because the fire suppression system at the marine terminal area is a manual system, and the control room will be staffed at all times while vessels are being loaded, automatic fire detection is not necessary.

Section 2.3, Facility Area 400 – Marine Terminal, page 2-2, bullet 7

The DEIS recommends that the Applicant provide information regarding emergency shutdown valve details on dock, and ensure that surge pressures stay within allowable piping pressure limits. More specifically at Appendix A (to Appendix B of the DEIS), Section 2.3, page 5:

> *Review and evaluate emergency shutdown valves on dock for closing speed, activation methods, fail safe operation, and check that surge pressures stay within allowable piping pressure limits. The 6-inch return line is intended as a pressure relief route in case of emergency shutdown of the loading pipeline.*

As described below, this information has been provided. The EIS should incorporate consideration of this information and revise or remove the statement at page 2-2.

The 30 percent design fire alarm system design drawings (Sheets 0400-FA-002, Sequence of Events), clearly reflects that upon activation of any manual foam release station or the flow of foam the emergency shutdown sequence will be initiated to stop the pumping/loading of crude oil.

Please refer to Section 2.3.3.6 of the DEIS regarding the location of isolation valves, and other pressure sensing equipment:

- *Piping would be constructed consistent with American Standards Testing and Materials (ASTM) A53 or A106.*
- *Transfer pipelines and the associated pumping systems would be equipped with flow and pressure sensors to identify pipeline or pump failures. Pressure relief valves would be included on the pipeline and pump to avoid overpressure situations.*
- *Transfer pipelines would be equipped with manual and automatic isolation valves at the exit and entrance to the railcar unloading area, the storage tank area, and the marine vessel loading area. These valves would include 30-second shutoff capabilities to stop the flow of product in the event of an anomalous flow and pressure condition related to an inadvertent release or in response to operations personnel triggering a shutoff.*

Additional isolation valves would be located at the proving skid intertie location, one between the 24-inch transfer pipeline and the 36-inch pipeline for direct rail to vessel operation and redundant valves at each tank and on both sides of the transfer pumps.

Activation of the shutoff valves would occur either through pressing the emergency shut down (ESD) button, or monitored sensors through the programmable logic controller (PLC), including but not limited to, seismic sensors, leak/flow detection, and pressure sensors. Emergency valves will be pneumatic powered and will be fail closed upon loss of air pressure or power.

Surges are addressed through use of the surge/return pipeline and reservoir storage (see DEIS at Section 2.2.26:

- *One 6- to 12-inch-diameter, approximately 5,300-foot-long pipeline to return crude oil from the vessel loading system back to the storage tanks when necessary, such as during loading process shutdowns. Since the pipeline is not normally in use, it would also function as a pressure relief system that would alleviate pipe hammer 10 in the pipe conveyance system during rapid valve closures.*

Section 2.3, Facility Area 400 – Marine Terminal, page 2-2, bullet 8

The DEIS recommends that the required life-safety information, including portable extinguishers, hose reels, and egress ladders to the water and life rings, should be provided at

the marine terminal dock area. This statement should be revised to indicate the Applicant is providing such equipment as indicated below.

The 30 percent design life-safety design drawings (Sheets 0400-LS-002), the Life Safety Basis of Design Engineering Evaluation Report, the Life Safety Analysis Report, and the Fire Protection Basis of Design Engineering Evaluation Report clearly reflect that fire extinguishers will be provided at the marine terminal area in accordance with NFPA 30, Section A.29.3.28. Because NFPA 30 covers flammable and combustible liquids, there will be three 30-pound Class B extinguishers and two wheeled 150-pound Class B extinguishers located at the dock. Portable fire extinguishers will also be located at Berth 14, in the E-house, and in the fire pump building.

Hose reels for firefighting purposes to be used by marine terminal area workers or occupants are not being provided for this project, nor are they required by the applicable codes and standards. In the fire protection industry, fire hoses to be used by workers or occupants of an area are defined as Class II Standpipe/Hose Stations as defined by NFPA 14, *Standard for the Installation of Standpipe and Hose Systems*. Additionally, fire hose reels or Class II Standpipe/Hose Systems are not being provided because the facility will not be provided with an industrial fire brigade nor training for employees on how to fight a fire. Unless all employees, occupants, and workers in the marine terminal area are provided with specific training on how to use fire hose reels or Class II Standpipe/Hose Systems, then they should not be provided. Having employees, occupants, or workers attempting to fight a fire using fire hose reels or Class II Standpipe/Hose Systems creates more of a risk to injury, than activating the remote controlled elevated monitor nozzle foam suppression system. The employees are expected to fight a small incipient level fire with a portable fire extinguisher if they are trained and comfortable with performing such duties and initiate the fire alarm by pulling a manual pull station or dialing 911.

The 30 percent design Life Safety Basis of Design Engineering Evaluation Report and the Life Safety Analysis Report do not specifically address egress ladders to the water or life rings; however, these items will be provided on the dock. This will be clarified as the fire protection and life-safety documents are developed for the project. A minimum of two ladders to the water and four life rings will be provided at the dock to initiate life-safety and water rescue.

Finally, Appendix B should incorporate the Applicant's commitment to comply with the applicable requirements of WAC 296-56, Safety Standards, Longshore, Stevedore, and Waterfront-Related Operations, as indicated in Section 4.16.1.3 of the PDEIS, and further detailed in Appendix F of the PDEIS.

The corresponding discussion in Appendix A (to Appendix B of the DEIS), Section 2.3 (page 5) should also be revised accordingly.

Section 2.3, Facility Area 400 – Marine Terminal, page 2-2, bullet 9

The following DEIS statement should be removed or revised to reflect information previously provided by the Applicant, indicating a state-of-the-art mooring system will be employed to avoid and minimize vessel drift:

> *Provide information and details for vessel drift envelope monitoring and protection.*

Appendix B should consider and include the following information provided at Section 2.2.2.10 of the PDEIS, page 2-26:

> *To provide an optimal, safe mooring configuration, two shore-based mooring points would be installed above the OHWM. Quick-release mooring hooks would be installed on a concrete base to handle mooring lines. New quick-release mooring hooks would be installed on all mooring points. The mooring system would incorporate a load monitoring system for the physical tensioning of the mooring lines so that they operate within optimum design limits while a vessel is berthed.*

Furthermore, the vessel drift envelope is an item that does not have a significant impact on the fire protection systems or features of the marine terminal area. From a fire protection standpoint, the remote controlled elevated monitor nozzles can be used to control a fire from a crude oil spill that would be within the vessel drift envelope area. Acknowledging that it is not normal practice to apply foam directly onto the river, but if the fire had the potential of causing a catastrophic event, then this could be performed. Furthermore, the Applicant has committed to using Solberg Re-Healing Foam Concentrate foam at the Facility. The Solberg foam is an innovative environmentally sustainable fluorosurfactant and fluoropolymer-free firefighting foam used to effectively extinguish Class B fuels with no environmental concerns for persistence, bioaccumulation or toxic breakdown, and is completely biodegradable. Per Solberg, the Re-Healing foam concentrates can be used in fresh, salt, or brackish water and possesses excellent burn-back resistance due to its remarkable flow and rapid sealing characteristics. Refer to the comment to DEIS Section 4.7.4.1, page 4-62, paragraphs 1 and 2.

Section 3.3, Fire Pumps and Emergency Power Supply, page 3-5
Appendix A, Section 3.3, page 3

Section 3.3 of the DEIS recommends inclusion of a redundant/back-up fire pump system for Area 200, Railcar Unloading Facility; Area 300, Storage Area; and Area 400, Marine Terminal. This statement should be revised to indicate applicable codes and standards do not require such redundancy, and this requirement should be deleted.

Based on the applicable codes and standards required for this project, there are no criteria that require a redundant fire pump to be provided.

Even though the power supply in the City of Vancouver and the Port may be considered as reliable, the Applicant has chosen to use diesel-driven fire pumps to increase the level of reliability.

These diesel-driven fire pumps will be inspected, tested, and maintained to ensure the fire pump will operate as required. All the diesel-driven fire pumps will be designed, installed, and tested in accordance with NFPA 20 and NFPA 25. The inspection, testing, and maintenance criteria required by NFPA 25 will ensure that these fire pumps are maintained in a state of readiness at all times. Weekly pump run tests are required by NFPA 25 for diesel-driven fire pumps. These weekly run tests of diesel-driven fire pumps enhance the reliability. Annual flow tests of fire pumps are required to verify they will produce the require flow and pressures. As with any mechanical component, including diesel-driven engines, maintenance will be required. The Applicant is committed to performing the inspections, testing, and maintenance to ensure that the diesel-driven pumps are ready for operation at all times. It is has been documented by the NFPA Fire Protection Research Foundation that properly inspected, tested, and maintained diesel-driven fire pumps provide a 99 percent yearly reliability (see Attachment B-1 to this comment letter). The life expectancy of a diesel-driven fire pump could be in excess of 30 years provided the diesel engine and pump are inspected, tested, and maintained as required by NFPA 25 and the manufacturer's published literature[4].

Additionally, all of the systems will be provided with a fire department connection so that if for some reason during an event that one of the diesel driven fire pumps fail the Vancouver Fire Department (VFD) will be able to supply adequate water to the system. Redundant fire pumps are not required nor justified for this project. Finally, as described in our comment to Section 2 of the DEIS, "In the event of a power failure for any reason, leased portable power generators (i.e., emergency engines) would be delivered to the site, connected, and started up to operate critical safety, security, and environmental equipment."

This section of the DEIS further recommends that emergency power must be provided for control and operation in order to monitor and allow safe shutdown of all systems, such as valves, pumps, boilers, etc., and for critical lighting for safe personnel movement and egress.

Based on the applicable codes and standards required for this project, we agree that emergency power is required for safe shutdown, fire alarm system operation, and emergency lighting; however, this can and will be provided by the use of batteries in the fire alarm system, emergency egress lighting, and exit marking/signs. The Life Safety Basis of Design document clearly indicates that emergency power for illumination will be required and provided in accordance with Section 1006.3 of the IBC 2012 edition. Emergency power for the safe shut down of all systems, such as valves, pumps, boilers, etc., will also be provide by a secondary power source if required. The fire pumps are diesel driven because the power to the Port was not considered "reliable" per the definition of NFPA 20. Emergency power is not required for the operation of the fire pumps.

[4] The Fire Protection Research Foundation, One Batterymarch Park, Quincy, MA – Fire Pump Field Data Collection and Analysis, Final Report, April 2012.

The fire alarm section of the Fire Protection Basis of Design Engineering Evaluation report, as well as the Life Safety Basis of Design Engineering Evaluation Report, will be expanded to clarify that emergency power, via battery backup, will be provided to operate the fire alarm system, exit signs, and emergency light in the event there is a loss of normal power. This will further be clarified as the fire protection and life-safety design document develop beyond the 30 percent design level. Emergency power is not required to operate the fire pumps for the project because these fire pumps are diesel driven and require no power. The power to initiate the starting of the fire pump will be from the fire alarm system or will operate upon the drop of water pressure in the system. Furthermore, any emergency power required to provide safe shutdown of all systems, such as valves, pumps, boilers, etc., will be clarified in the design documents.

The fire alarm system will be provided with emergency power to ensure system operation in the event of the loss of power. The standby batteries in the fire alarm system will be sized for 24 hours of standby current and 5 minutes of alarm. Acknowledging that the fire alarm systems' main function is to detect a fire, activate the respective fire suppression system, notify building occupants, and notify the emergency responders, 24 hours of standby and 5 minutes of alarm is more than adequate to accomplish these functions. Furthermore, anytime that the primary power is lost and the secondary power supply is used, a trouble signal will be transmitted to a constantly attended location.

All buildings will be provided with illuminated exit signs that will be provided with a secondary power supply to ensure that the exit signs will be properly illuminated to clearly identify the exit paths. Additionally, emergency lighting will be provided throughout each building to illuminate the means of egress as required by the IBC. The secondary power supply provided to both the exit signs and the emergency lights is provided to ensure safe and orderly means of egress from the building upon the loss of normal building power. This secondary power supply will be designed to sustain illuminated exit signs and emergency lighting to light the means of egress for a minimum of 90 minutes.

The analysis in Section 3.3 should be revised to take into consideration the information above, and similar changes should be made to Appendix A (to Appendix B of the DEIS).

Section 4.1, City of Vancouver Water Supply, page 4-1

The DEIS claims that more data is needed to validate that the City water supply is adequate to meet the fire protection demands. Furthermore, the DEIS suggests that a portion of the City water supply to the Port be reduced to a 12-inch main and that the water supply to the western area of the Port is not looped for redundancy. Appendix B (and relevant sections of Appendix A [to Appendix B of the DEIS]) should be revised to incorporate the information below as addressing water supply adequacy.

Based on the Fire Suppression Hydraulic Analysis performed by Poole Fire Protection, the largest overall calculated fire water demand would be at Area 300 – Storage, which includes the fire suppression for the crude oil storage tanks, combined with the hydrants for exposure protection. This demand is 3,025 gpm at 117.3 psi. Based on the hydrant flow tests performed by the City of Vancouver in May 2013, the City's water distribution system is capable of delivering the required quantity of flow, but does not provide the required pressure. For this reason, fire pumps are being provided, which is clearly documented in the Fire Suppression Hydraulic Analysis and the Fire Protection Basis of Design Engineering Evaluation Report.

Based on these hydrant flow tests performed by the City, the water distribution system is capable of delivering in excess of 3,500 gpm for the required duration required by the applicable codes and standards. Therefore, it is irrelevant if a portion of the water distribution system that supplies water to the Port is supplied by a 12-inch water main or if it is not looped. According to information received from the Port[5], the project to create a looping the fire water piping has been budgeted for 2017. The change to the system will increase the level of reliability of the system and allow flow from multiple directions. The Port has also installed a 12-inch line (dedicated to the City) associated with the Port's Centennial Industrial Park; this line connects the city water network between LaFrambois Road and State Route 501/Lower River Road and further creates looped redundancy in the area. The Port of Vancouver can further elaborate on their plans for water supply infrastructure upgrades planned in 2017 and other redundancy improvements.

The Applicant will coordinate with the City to confirm the size of the underground mains and to further validate that they will be able to maintain a flow rate of 3,500 gpm to the Port. Specific details will be added to the Fire Suppression Hydraulic Analysis and the Fire Protection Basis of Design Engineering Evaluation Report to clarify the water distribution system upgrades to be performed to increase the system reliability.

Section 6.2, Compatibility of Hose and Hydrants, Hydrant Locations, page 6-1

The DEIS notes that there was no clear indication that fire department connections are being provided on the Facility side of the fire protection system that would allow VFD to augment that system with backup water and/or foam supply. This statement should be clarified based on the following additional information.

The 30 percent design fire protection system design drawings (Sheets 0200-FP-001 [Detail 2], 0300-FP-001 [Detail 2], and 0400-FP-001 [Detail 2]), clearly reflects that downstream of each fire pump, for each respective area, a fire department connection is to be provided. For each area, a fire department connection should not be provided downstream (or "Facility side") of the foam proportioning equipment as this would significantly affect the proportioning of the foam

[5] Edberg, 2016. Personal communication from Monty Edberg to David Corpron. Future funding of fire flow redundancy improvements and installation of 12 inch waterline dedicated to the City for additional redundancy. January 20, 2016.

solution. Furthermore, the fire department connection is located downstream of the fire pump; therefore, if the fire pump is out of service for maintenance or testing, water can still be provided to all fire suppression systems in each area via the respective fire department connection.

Even though the design drawings reflect that a fire department connection is to be provided downstream of the fire pump for each area, further detail can be provided in the Fire Protection Basis of Design Engineering Evaluation Report to clarify that fire department connections will be made available for the VFD to augment the systems with backup water and/or foam solution supply if they desire. From the 30 percent design through the 100 percent design process, the Applicant's Design Team will meet with the VFD to coordinate the location and size for all fire department connections.

Chapter 7, Fire Department Response – Rail, page 7-1

The DEIS claims that the VFD and other neighboring fire departments are often underprepared when responding to these types of incidents and they have expressed a concern about their current readiness and capability to respond to certain rail incidents. Through meetings with fire department representatives and through the results of the survey performed, they claim that additional staff, training, and equipment would be needed to respond to an incident at the facility or along the rail corridor.

It is the understanding of the Applicant that the local responding fire departments follow the requirements of the NFPA codes and standards. Just to name a few, NFPA 1001, NFPA 472, and NFPA 1500 provide the minimum job performance and safety requirements for career and volunteer fire fighters to ensure they are adequately trained for incidents that may occur within their jurisdiction. The Applicant has agreed to provide specialized training and pre-fire planning support to local responding fire departments to ensure that the responding agencies and personnel are adequately trained to NFPA 1081 standards for industrial fire brigade. There was recently a bill passed in the State of Washington (HB 1449) that taxes each barrel of oil coming into the state by rail. The intent of that tax was to create a way to fund local emergency response needs, such as equipment. The Applicant would be happy to work with the fire departments in our area to help them interface with Ecology and get some of the money for equipment, supplies, and/or training they feel is needed due to this project.

The statements in the DEIS should be revised to reflect that the Applicant is willing to provide specialized training and pre-fire planning support to local responding fire departments in support of ensuring the responding agencies and personnel are adequately trained and that the Applicant will be willing to work with each responding fire department and specifically the VFD to ensure they have the required quantity of firefighting foam agents to support a fire incident at the facility.

Similarly, Appendix B should recognize the training opportunities made available to emergency responders by Class 1 railroads, such as BNSF's training discussed at page 4-9 of the DEIS (Specialized Crude by Rail First Responder training at the Association of American Railroads Transportation Technology Center Inc. (TTCI) in Pueblo, Colorado, with tuition reimbursements), as well as the extensive local training opportunities described in the PDEIS at Section 5.9.1.2 as follows:

> *BNSF also works closely with local emergency responders who may also be called to respond to an incident. Every year, BNSF provides on-site hazardous materials training to approximately 4,000 community responders at no cost. BNSF develops procedures and trains in coordination with local responders throughout communities located in its Washington State rail network, including, but not limited to, the communities of Vancouver, Pasco, Spokane, and Klickitat and Skamania Counties. BNSF coordinates training sessions directly with larger jurisdictions such as the Vancouver Fire Department, and also offers training to personnel from smaller jurisdictions through on-going publicized opportunities. Training is based on BNSF's System Emergency Response plan, and includes both classroom and field sessions using specialized training rail equipment. Since 1996, BNSF has trained over 60,000 responders. BNSF conducted this type of training in the Vancouver-Portland metropolitan area in July 2013, providing training to approximately 150 people over three days (The Columbian 2013). Training topics include the interpretation of train list/shipping appears, placards, understanding rail car equipment, assessing incidents, and practicing with hands-on equipment in the field with an instructor lead. Additionally, BNSF makes a self-paced hazmat emergency response computer based training program available to fire departments along its routes. Finally, to prepare for hazardous materials emergencies, BNSF provides, upon request, its hazmat traffic flow information to community, county, and state emergency planners and local responders.*

The burden is on the Applicant to ensure the proposed Facility is designed, constructed, and maintained to comply with applicable codes and standards (such as IBC and NFPA as demonstrated elsewhere), which effectively mirror the codes adopted by the City of Vancouver and all other nationally recognized applicable rules and regulations.

The DEIS should also be revised to recognize the duty of firefighters to remain appropriately trained, and the NFPA codes and standards that address the fire fighter job performance and safety requirement and the pre-incident planning:

- National Fire Protection Association (NFPA), NFPA 472, Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents, 2013 Edition
- National Fire Protection Association (NFPA), NFPA 1001, Standard for Fire Fighter Professional Qualifications, 2013 Edition
- National Fire Protection Association (NFPA), NFPA 1002, Standard for Fire Apparatus Driver/Operator Professional Qualifications, 2013 Edition
- National Fire Protection Association (NFPA), NFPA 1002, Standard for Fire Apparatus Driver/Operator Professional Qualifications, 2013 Edition

- National Fire Protection Association (NFPA), NFPA 1005, Standard for Professional Qualifications for Marine Fire Fighting for Land-Based Fire Fighters, 2014 Edition
- National Fire Protection Association (NFPA), NFPA 1006, Standard for Technical Rescuer Professional Qualifications, 2013 Edition
- National Fire Protection Association (NFPA), NFPA 1021, Standard for Fire Officer Professional Qualifications, 2013 Edition
- National Fire Protection Association (NFPA), NFPA 1026, Standard for Incident Management Personnel Professional Qualifications, 2014 Edition
- National Fire Protection Association (NFPA), NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2013 Edition

Although the comment above is focused on addressing the statement in Appendix B, the same information should be considered on the same topic as discussed in the sections of Chapter 4 of the DEIS, including, but not limited to, Sections 4.6.3.3, 4.6.4.3, 4.7.9.1, 4.7.9.2, 4.7.16.2, and 4.9.2.

Appendix C: Evaluation of Seismic Hazards

Summary of Key Findings, Area 400 Marine Terminal (Dock and Adjacent Transfer Pipeline), page s-ii, paragraph 3

Please see the comment to Sections 3.1.3.4 and 3.1.5, pages 3.1-26 and 3.1-30.

Summary of Key Findings, Area 400 Marine Terminal (Dock and Adjacent Transfer Pipeline), page s-ii, paragraph 2

Please see the comment to Sections 3.1.3.4 and 3.1.5, pages 3.1-26 and 3.1-30, regarding the use of FLAC or PLAXIS modeling for the deep soil mix panels.

Section 5.2.1, Area 300 Tanks and Area 500 Pipeline, page 5-4, paragraph 3

Summary of Key Findings, Area 500 Tank to Shoreline Pipe, page s-ii, paragraph 1

Please see the comment to Sections 3.1.3.4 and 3.1.5, pages 3.1-26 and 3.1-30, regarding the depth of stone columns.

Section 5.2.2, Area 400 Marine Terminal, page 5-5, paragraph 1

The DEIS states:

> *"It should be noted that there is no well-established seismic performance record of the DSM panels supported on jet grout columns"*

Although the Applicant agrees that the performance record specific to deep soil mixing (DSM) supported on jet grout columns is not well established, there is a well-established seismic performance record of the various elements of the ground improvement scheme being proposed for Area 400. However, the DEIS does not recognize that ground improvement schemes are designed to address site-specific conditions, and as for other complex projects, the design selected is unique and customized to the conditions being addressed.

The Applicant requests the following language be included in the Final EIS to emphasize that lack of an established record of performance of a specific ground improvement configuration is not sufficient to conclude that the proposed design will not be sufficient:

> <u>The various elements of the proposed ground improvement system (i.e. stone columns, deep soil mixing, jet grouting, etc.) have a well-established seismic performance record. As the design hazards have increased, the combination of various ground improvement methods is becoming common, if not routine. The specific arrangement of the multiple ground improvement methods has been customized for this project, the anticipated hazards, and the amount of allowable movement. Like other complex projects, the proposed design has been customized to the specific site so it is not surprising that there is no well-established seismic performance record for this specific site and this design.</u>

Section 7.2, Design for Permanent Ground Deformation, pages 7-3 and 7-4

The requirement for use of FLAC or PLAXIS to analyze the marine structures within Area 400 should be removed.

Appendix C states[6]:

> *In addition to pseudo-static methods of stability analysis, nonlinear dynamic analyses using numerical models (e.g., FLAC, PLAXIS) are recommended to analyze the Marine Terminal in its improved soil state. Simple models of the marine structures should be included to account for inertial loads due to soil-structure interaction. The results from both pseudo-static and dynamic methods would provide more confidence in the design.*

At the Berth 13 structure, based on the current design of the ground improvements, the need for additional numerical modeling is also not warranted. See the comment to Sections 3.1.3.4 and 3.1.5, pages 3.1-26 and 3.1-30.

Section 8, Conclusions, page 8-1 (Earth – Area 300 Seismic Design of Containment Berm)

The recommendation that the ground improvement scheme include stone columns throughout the secondary containment berm should be removed.

The DEIS says:

> *At the storage area (Area 300), no ground improvement is proposed for soils underlying the secondary containment berm. The stone columns under the foundations supporting the storage tanks do not extend to the berm. Therefore, potential exists for liquefaction and ground deformation under the secondary containment berm. Designing the berm to withstand ground motion/shaking is appropriate but needs to be combined with an assessment of required mitigation for potential liquefaction (i.e., ground improvements) beneath the berm.*

It appears the DEIS is recommending the possible need for ground improvement under the berms for two reasons: (1) Berm Seismic Settlement resulting in the berm being too low and (2) Berm Seismic Stability where there is a risk the berm will experience a slope stability failure due to shaking or loss of bearing capacity due to liquefaction.

1. Berm Seismic Settlement. The GRI Report (December 20, 2013) conservatively estimates that Area 300 could see between 6 to 10 inches of liquefaction-induced settlement. The NFPA 30 code requires that 100 percent of the largest tank be contained within the bermed area, minus the volume of the other contained tanks (NFPA 30 22.11.2.2 and 22.11.2.2.1). The City of Vancouver also requires the containment of the 25-year 24-hour storm (3.5 inches). Based on these requirements, the current design of containment has

[6] The EIS authors should note that this mitigation measure was not included in the Executive Summary of the DEIS, nor in Chapter 3.

13.5 inches of freeboard, which is more than the conservative estimate of maximum settlement. In an effort to exceed the code and statue requirements stated above, the design team has looked at a design of 110 percent of the largest tank and the 100-year 24-hour storm (4.3 inches). This results in a freeboard of 8 inches. In a worst-case scenario of maximum liquefaction-induced settlement, at the same time of design rainstorm, not only will the berm settle up to 10 inches but so will the other non-ground improved surface area inside of the berm. Therefore, 8 inches of freeboard is sufficient to contain the design scenario that is being hypothesized.

2. Berm Seismic Stability. GRI has addressed seismic stability of the berm in terms of bearing capacity failure or breaching as follows. Based on an assumed groundwater Elevation +12 feet, and the thickness of well-compacted structural fill at the storage site, the site will be mantled with 15 to 20 feet of non-liquefiable soils. Based on this thickness of non-liquefiable soils, the risk of reduced seismic bearing capacity impacting the berm is low. In addition, short 2H:1V slopes, such as these consisting of structural fill, traditionally perform well during earthquake shaking. In our opinion, the risk of the code earthquake damaging the berm and causing breaches is low.

Note that the risk of seismic bearing capacity and slope stability of the berm has been preliminarily evaluated, the risk is low, and ground improvement not required.

Section 8, Conclusions, page 8-1, paragraph 6

The conclusions regarding the need to check the stability for the MCE should be removed.

Appendix C states:

> *If the Applicant elects to design the soil improvement at the Marine Terminal to mitigate potential slope failure for only the DE motion (= 2/3 MCE motion), as required by the ASCE 7-05 standard, then a check of the stability for the MCE would be prudent.*

All of the ground improvement design in Area 400 is based on the MCE earthquake motions per IBC 2012. Because the basis of design for the Area 400 ground improvement is stated as IBC 2012 in the HBI design report, it is not necessary to consider the condition where the Applicant "elects to design the soil improvement at the Marine Terminal to mitigate potential slope failure for only the DE motion (= 2/3 MCE motion), as required by the ASCE 7-05 standard."

The earthquake motions used are stated in the basis of design section of the HBI report, Section 3.2.2 on page 5, previously submitted to EFSEC[7].

[7] Hayward Baker. April 15, 2015. Vancouver Energy Terminal Ground Improvement Design-Areas 300 and 400.

Appendix G: Air Emission Calculations

Tab L Operational GHG Emissions, page G-35

The computation of project-related greenhouse gases (GHGs) is incorrect as indicated below and should be corrected; Section 3.2.4.4 of the DEIS should be updated to reflect the correct Facility GHG emissions.

It is unclear from what source the DEIS emissions data originated because the values used in the computation of Scope 1 GHGs do not correspond with any of the cited source documents. The total estimated Scope 1 emissions are too high based on the air quality permitting analysis submitted to EFSEC in August 2014 (and reflected in Appendix F to the DEIS, Attachment A). The annual emissions computed by the Applicant were 86,166 metric tons GHG per year. Appendix G of the DEIS should clearly identify the source of the data used and recompute the Scope 1 GHG emissions.

The computation of GHGs related to purchased electricity incorrectly applies emission rates taken from the U.S. Environmental Protection Agency (USEPA) eGrid2010 database. It appears the calculations for N_2O and CH_4 mistakenly applied emission factors expressed in pounds/**giga**watt hour as emission factors based on pounds/**mega**watt hour. Correctly applying these factors, and using data available from eGrid2012 reduces the estimated GHGs from purchased power by 87 percent. The calculations in the DEIS should be corrected using the correct conversion factors.

Due to these errors, the GHG tabulations shown in Tables 3.2-12 and 3.2-13 overstate the annual and the 20-year life-cycle GHG emissions from the facility. The overall overstatement is about 39 percent as indicated in the table below.

GHG Emissions Type	Actual Annual Emissions CO_2e (tonnes)	Estimated 20-Year Emissions CO_2e (tonnes)	DEIS Annual Emissions CO_2e (tonnes)	DEIS Estimated 20-Year Emissions CO_2e (tonnes)
Scope 1 (Direct)	86,184 [a]	1,723,680	115,430	2,308,600
Scope 2 (Purchased Elect)	25,603 [b]	512,065	196,616	3,932,320
Scope 3 (Indirect - transport)	200,304 [c]	4,006,080	200,304	4,006,080
Total	312,091	6,241,825	512,350	10,247,000
Overstatement in DEIS (percent)			39.1%	39.1%
Overstatement in DEIS (tonnes)			200,259	4,005,175

[a] From August 2014 ASC
[b] Recalculation using EPA eGrid2012
[c] Assumed same as DEIS

Additional comments regarding the consideration of design measures that further mitigated GHG emissions are presented relative to Section 3.2.4.4 previously in this document.

Appendix J: Vessel Spill Risk Analysis

Throughout the DEIS, there is a lack of consistency in defining the range of vessel sizes within a specific nomenclature (e.g., "Aframax"). Use information provided in Appendix J as a reference to correct discussions throughout the DEIS.

Volumes for Contingency and Response Planning for Vessel Spills, page 10, Table 3

The DEIS stated that the maximum loaded cargo is 729,560 barrels (bbl) for a 165,000-DWT Suezmax, a maximum calculated value based on draft and capacity. Per information provided by the Applicant, the maximum loading of any tanker would be 600,000 bbl.

Per administrative controls at Vancouver Energy, the maximum loading of any tanker at the Facility would be 600,000 bbl. The statements and analyses in the DEIS should be revised to reflect this maximum loading.

Volumes for Contingency and Response Planning for Vessel Spills, page 10, Tables 3 and 4

Currently only 25 to 40 percent of the volumes handled at the Facility are expected to be diluted bitumens. The analyses described in Appendix J and reported elsewhere in the DEIS should be revised to appropriately characterize the impacts.

Degree of Impact of Crude Oils, page 22, Table 21

At page 22, Appendix J states:

> *The spill volumes of a sampling of the various outflow scenarios from underway- and transfer-related spills were analyzed with respect to degree of evaporation and dispersion to estimate the amount of oil remaining. This amount of oil was then assumed spread over a typical slick thickness of 0.1 mm for fresh oil and 0.0003 mm for rainbow sheen, as shown in Table 21 for Bakken crude...*

Similar statements are made relative to Table 42 of Appendix J. Table 21 and Table 42 and associated discussions should be removed or edited as they are misleading.

A calculation of the length of river that could be covered by an oil sheen does not scientifically describe the potential environmental effects from an oil spill on a river. Table 21 and Table 42 indicate that 74,153 miles of river is the estimated spread of Bakken crude oil on the water surface (0.0003 mm). The tables and discussion are misleading, as oil on the river cannot spread in this way and would not spread 74,000 miles on the river.

A rigorous discussion of crude oil fate and transport relevant to the Columbia River should be included in the DEIS.

Probability Distributions of Oil Outflow in Vessel Impact Accidents, page 11, footnote 6

Discussions and analyses in Appendix J (and corresponding text within the body of the DEIS) should be revised to only include impacts from 105,000-MDWT vessels. Please see comment to Section 2.7, page 2-69, Table 2-1 of the DEIS. As noted in footnote 6,

> *…… The modeling of oil outflow from a 125,000 DWT versus a 105,000 DWT Aframax tanker would not be different due to the margins of error inherent in the underlying assumptions for the IMO outflow model. While the data represented from the outflow modeling is for a typical Aframax tanker of 125,000 DWT-sized vessel, the modeling outcome is also applicable to a 105,000 DWT Aframax tanker….*

Also, Appendix J uses the terms MDWT and DWT interchangeably; this inconsistency should be corrected and MDWT should be used exclusively throughout the DEIS to avoid confusion.

Probability Distributions of Oil Outflow in Vessel Impact Accidents, pages 13, 33, and 39, and Table 7 footnote

It is unclear whether the DEIS model for calculating the probability of spill given that a collision occurs considers the collision geometry in the river (that is bow-on and glancing blows are most likely, but almost never lead to a spill of cargo). It is also unclear whether the DEIS model considers the bottom type when estimating the probability of a spill from a grounding.

The DEIS model input was based on local incident data (collision frequency and reported grounding frequency), but the probability for a spill from either event was based on global incident data. The DEIS does not describe if or how the global data was adjusted to reflect local conditions, which should affect the probability of a spill for both collision and grounding incidents.

Global collision data consists of many open-water events at higher vessel speeds than are typical in many parts of the river. In addition, the global grounding data consists of primarily events in hard bottom locations. The global data for grounding spills should be modified to relate to the Columbia River because it does not adjust for the significant proportion of soft bottom along the river.

Further description of the DEIS navigation risk model would clarify how and whether local conditions were accounted for when applying the International Maritime Organization (IMO) approach to spill probabilities. Specific examples of such local conditions are collision geometry in a river and bottom type.

The DNV GL Quantitative Vessel Traffic Risk Assessment used the MARCS model to estimate navigation incident frequencies, and the Naval Architecture Package (NAPA) model to estimate potential oil spill outflows. The MARCS model is described in detail in Appendix D of the report. The NAPA model applies 10 years of damage statistics from 1980 to 1990. During this period, the majority of the tankers involved in oil spills were single hull tankers, whereas on the

Columbia River, all tankers are double hulled. Because of this, the release volumes in the DNV GL Quantitative Vessel Traffic Risk Assessment are conservative. This conservatism has been partly compensated for in the NAPA model, by transferring the statistical damage (indentation depth and holes) to a modern double hull tanker to model if the damage would have caused a breach in one or more tanks of a double-hull tanker.

Effective Worst-Case Discharge Volumes, page 16

Please see the comment to Section 2.7, page 2-69, of the DEIS. Several statements in Appendix J incorrectly state the implications of a channel depth of 43 feet and should be accordingly corrected. For example:

> *Based on the analyses above, the "effective" worst-case discharge volumes for tank vessels that would call at the proposed Vancouver Energy facility are as shown in Table 13. The regulatory WCDs are based solely on the vessel size and its maximum cargo capacity loaded to a 43.0-foot draft.*

See also the statements at page 28:

> *Theoretically, the WCD planning volume should be based on the vessel's cargo capacity, i.e., the amount of oil it would carry when fully loaded. But, given the draft limit of 43.0 feet in the Columbia River, there is a limit as to the actual cargo that can be accommodated in the largest tankers. Since weight (and not volume) would determine the actual draft of a fully-loaded tanker, the specific gravity of the oil is a contributing factor.*
>
> *…. Another issue involved in determining the possible cargo capacity given the 43.0-foot channel draft restriction,….*

Analyses and conclusions in Appendix J should be revised on this basis.

Probability Distributions of Oil Outflow in Vessel Impact Accidents, page 30, footnote 37

The description of the DEIS modeling of navigation accidents is unclear concerning many modeling details, including:

- How are probabilities estimated for each potential size of striking vessel and each potential size of vessel being struck?
- How was it determined which vessels can cause cargo tank damage, and which cannot? Was this solely on mass, or did it account for vessel speed of one or both vessels?
- How do the cargo spill probabilities relate to which vessel is striking and which is struck?
- How are ship velocities in various parts of the river accounted for in the model?

The following text appears in footnote 37 on page 30 of Appendix J:

> *Estimates of side impact accidents assume that a second equally-sized vessel hits the tanker with enough force to potentially cause spillage.*

The EIS authors should provide additional details on the navigation risk model used in the vessel accident analysis.

The DNV GL Quantitative Vessel Traffic Risk Assessment used the MARCS model to estimate the frequency of navigation incidents accounting for potential angles of impact. The conditional probabilities in the model are based on the local traffic ship types and speeds (from Automatic Identification System (AIS) data), the traffic lanes, and other data described in Section 5.2 of the report. The model output includes strike angle and ship types involved in the incident. The method used to estimate the likelihood of an oil spill from an incident is described in Section 6 of the DNVGL Risk Assessment.

Probability of Transit Related Spillage, page 38, Table 36

Table 36 identifies 2013 baseline overall vessel trips as "1,457" and tankers trips as "280," based on information submitted by the Applicant and Washington State Department of Ecology (Ecology) Vessel Entries and Transit (VEAT) data. This information referenced Appendix N to the PDEIS.

To clarify, Table 1-1 of Appendix N (page 6) to the PDEIS only identified "Existing Vessel Calls per Year" and did not quantify tanker calls alone. That said, the Applicant has relooked at the 2013 VEAT data used to prepare Appendix N and has been unable to verify how 2013 VEAT data was interpreted to conclude that 280 tanker calls occurred. To the contrary, the VEAT data lists only 63 tank vessel calls in 2013. The DEIS should identify how the baseline 2013 tanker call number was established.

Appendix A: HECSALV Model Approach

Appendix A does not describe the validation or verification of the HECSALV model. The EIS, or appendices thereto, should include a description of the validation and verification of the HECSALV model.

Appendix A: HECSALV Model Approach, page 55

One collision between a Vancouver Energy tanker and an Aframax tanker was modeled to represent the range of oil spill risk from a transiting Vancouver Energy-related vessel. This overly simplifies both the likelihood of such an event and the consequences of the event. It is not possible to determine whether the probability distributions inside the model account for the probability of an encounter between a Vancouver Energy-related vessel and an Aframax at sufficient speed (and angle) to breach a cargo tank on the Vancouver Energy-related tanker.

The DEIS states:

> *The damage probability distributions are based upon the dimensions of the vessel under consideration. For groundings this is appropriate. For collision this does not take into account the energy associated with the striking vessel. An underlying rationale for this assumption is that the energy of the striking ship will be consistent with existing damage records, which reflect tankers operating in waters where they have primarily encountered similarly sized vessels.*
>
> *For Suezmax tankers in the Columbia River this is not likely to be true for the case of collisions, and thus the damage extents could be smaller for that vessel than reflected in the simulation. For this reason, additional simulations were conducted in which it was assumed that the Suezmax would collide with an Aframax tanker. The probability distributions for damage are based upon damage statistics for accidents where there was a hull breach, so they represent conditional probabilities given hull penetration.*

The EIS should provide the detailed probabilities/event tree for the collision model frequency and the energy threshold/hole size assumed in the cargo tank.

The DNV GL Quantitative Vessel Traffic Risk Assessment probabilities are based on SAFECO studies[8]. The force needed to breach a cargo tank, given a ship striking a Vancouver Energy tanker, was calculated based on the ship type and weight (Section 7).

Appendix D: Vessel Spill Risk, page 48

Appendix D to Appendix J acknowledges both the prevention and response sides of risk mitigation. Page 48 of Appendix J also acknowledges:

> *The best way to mitigate risk of vessel spills in the Columbia River would be to prevent spills from occurring in the first place. Once the oil has spilled, response measures will reduce the impacts to some degree.*

The DEIS describes some prevention measures, but often in the form in regulatory requirements. Facility-specific procedures, equipment, and controls are not listed in the DEIS, but are key aspects of risk mitigation. See previous comment on Section 4.2.4, page 4-6.

The DEIS also describes some consequence-reducing response measures; although it does not list important measures that would reduce the quantity released, such as attempting to pump the remaining oil out of each of the 12 tanks to reduce the volume outflow when a ship is damaged.

The DEIS should identify possible mitigation measures that will reduce or eliminate the adverse environmental impacts of the proposed project. The discussion should include information on

[8] SAFECO I: "Safety of Shipping in Coastal Waters (SAFECO I) Summary Report," DNV 98-2038, 1998; SAFECO II: "Safety of Shipping in Coastal Waters (SAFECO II) Summary Report," DNV 99-2032, 1999.

the intended environmental benefit of the proposed mitigation as it relates to the identified impact.

If the technical feasibility or economic practicality is uncertain, the mitigation measure can still be discussed but discussion of the uncertainties should be included. The EIS should also clearly identify the mitigation measures as either mandatory or as potential so reviewers may better assess the impacts of the proposal.

Appendix N: Socioeconomics Tables

Table N-11, Underlying Costs of Rail Traffic Delays, page N-19

Table N-19, Estimates of Percent Change in Single in Single-Family Residential Property Values from Assumed Incremental Project Traffic (Four Trains per Day) Based on Futch (2011), page N-27

Table N-20, Estimates of Percent Change in Single-Family Residential Property Values from Assumed Incremental Project Traffic (Four Trains per Day) Based on Simons and El Jaouhari (2004), page N-27

Tables N-11, N-19, and N-20 incorrectly references reports by Schatzki and Strombom. From each of these tables, the following incorrect reference should be removed:

> *Schatzki, Todd and Bruce Strombom, "Assessment of the Socioeconomic Impacts of the Vancouver Energy Distribution Project: Primary Economic Impacts," July, 2014*

The correct reference for each of these tables is:

> *Schatzki, Todd and Bruce Strombom, "Assessment of the Socioeconomic Impacts of the Vancouver Energy Distribution Project: Secondary Economic Impacts," September, 2014*

Table N-17, Summary of Proposed Action Tax Impacts, page N-26

The DEIS identifies several economic benefits that were not identified in the PDEIS. First, the DEIS considers taxes to the governments within the state of Oregon. Specifically, the DEIS quantifies income tax revenues to the state of Oregon, finding that the project would generate approximately $362,100 in income tax during both construction phases and $332,900 annually with full operations in 2017.[9] Moreover, estimates in the DEIS actually understate the likely change in Oregon income taxes because the calculations in the DEIS reflect only a portion of Facility employment during the construction phase.[10] When accounting for all construction employment, likely Oregon income tax revenues from the Facility would be approximately $610,000.

Second, the DEIS notes that the additional rail activity may lead to additional railroad employment (and associated economic benefits).[11] However, because of the broad expanse of the rail system, these positions may not be filled from the local population, but from other geographic areas within the western rail system.

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[9] DEIS, Table N-17, Appendix N.

[10] Calculations in Table N-18 understate likely Oregon income tax revenues in the construction phase by not considering off-site direct employment (reflecting an additional 90 full-time equivalent positions) and under-stating all Phase II construction employment (96 full-time equivalent positions, rather than 50 position, as assumed in the DEIS).

[11] DEIS, Section 3.16.3.2, p. 3.16-14.

Table N-21, Estimated Delay Costs Associated with Increased Rail Traffic, 2014 Dollars, page N-28

The DEIS estimates the cost of rail crossing delays to be approximately $220,660 annually once the Facility reaches full operations.[12] This value is higher than that estimated in the PDEIS due to a combination of factors, including slower assumed train speeds and a larger number of crossings analyzed. Based on this analysis, the DEIS concludes that this impact represents a "moderate cumulative effect."[13] This conclusion appears unreasonable. In comparison to the positive economic benefits created by the Proposed Action, the impact associated with rail crossing delays is comparatively small. During full Facility operations, the Proposed Action would lead to annual increases in labor income of approximately $90 million and annual increases in total value added (including tax revenues and proprietor income) approximately $116 million. Thus, these gate-down delays are 0.2 percent of labor income and 0.2 percent of total value added. It is unreasonable to conclude that an impact representing less than 1 percent of these benefits should be considered "moderate."

[12] DEIS, p. 3.16-15; also, Table N-21, Appendix N.

[13] DEIS, Section 5.17.2, p. 5-43.