WASHINGTON STATE DEPARTMENT OF
Natural Resources
Peter Goldmark - Commissioner of Public Lands

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June 13, 2016

Millennium Bulk Terminals EIS
c/o ICF International
710 Second Ave, Suite 550
Seattle, WA 98104

Subject: Comments on the Millennium Bulk Terminals draft EIS

Dear Co-Lead Agencies:

Please accept these comments from the Washington State Department of Natural Resources (DNR) regarding the draft Environmental Impact Statement (DEIS) for the proposed Millennium Bulk Terminals coal export terminal at Longview, Washington. DNR is the manager of over 3 million acres of state trust lands comprised of forest, range, commercial, and agricultural lands, and 2.6 million acres of state-owned aquatic lands. In addition, DNR administers the state Forest Practices Rules on more than 12.7 million acres of non-federal, public, and private lands.

DNR is committed to sustainably managing the state's resources, relying on sound science, and making transparent decisions in the public's interest and with the public's knowledge throughout the environmental review process. I have directed my staff to provide technical support to the co-lead agencies towards ensuring a robust, science-based, and comprehensive environmental review process.

DNR is regarded as possessing special expertise under Washington state's environmental policy act rules, Chapter 197-11-920, Washington Administrative Code (WAC) related to the following areas: water resources and water quality of state-owned aquatic tidelands, shorelands, harbor areas, beds of navigable waters; natural resources development; energy production, transmission, and consumption (geothermal, coal, and uranium); land use and management of state-owned or managed lands; recreation; and burning in forests. DNR is also an agency with jurisdiction for this project under Chapter 197-11-714(3), WAC.

The proposed project includes two new docks supporting two new ship loaders, an access trestle, and dredging of a new berthing area. Each of these project components would occur on state-owned aquatic lands that are currently leased for an existing dock and related facilities, and would require DNR's approval. Additional authorization from DNR is also necessary for dredging outside the lease area and geotechnical studies or other pre-construction activities requiring entry onto state-owned aquatic lands. These authorizations make DNR an agency with jurisdiction under the State Environmental Policy Act, Ch. 43.21C RCW (SEPA) rules. DNR will consider whether to approve the proposed terminal on state-owned aquatic lands after DNR completes a thorough review of the potential project impacts documented through the

environmental review, permitting, and public comment processes and any additional information pertinent to its review under the lease.

DNR appreciates the opportunity to submit comments on the DEIS which are provided in the attachment to this letter. The attachment identifies where DNR has identified probable significant adverse impacts needing further analysis and identification of potential mitigation measures, or impacts that have not been addressed in the DEIS. DNR would appreciate being treated as a consulted agency as defined in WAC 197-11-724 throughout the SEPA process.

Should you have any questions regarding this letter, please do not hesitate to contact me at 360-902-1034.

Sincerely,

Megan Duffy
Deputy Supervisor for Aquatics & Geology

IMPACTS TO STATE-MANAGED LANDS IN THE IMMEDIATE PROJECT VICINITY

Chapter 4 Natural Environment
Geology and soils, Page 4.1-15

Seismic: The DEIS understates the likelihood of a subduction earthquake event. The average recurrence interval of a magnitude 8 to 9 earthquake on the Cascadia subduction zone is estimated at 240 years, and the last major earthquake occurred in 1700. A recent study estimates a 37% probability (i.e., greater than 1 in 3) that a magnitude 8 to 9 or greater earthquake will occur somewhere along the Cascadia fault in the next 50 years.[1] This affects operations, as it would result in direct impacts related to ground shaking, landslides, and liquefaction, and should be analyzed in the Operations-Direct Impacts section of the FEIS.

- Please provide mitigation measures to ensure that the facility, including coal storage and handling processes and structures (including loading and offloading), are resilient under a magnitude 8 to 9 earthquake along the Cascadia fault.
- Please provide mitigation measures to address coal train derailments and resulting coal spills both in the Project Area and along the rail routes in the event of a magnitude 8 to 9 earthquake along the Cascadia fault.

Levees: The DEIS describes levees built in the 1920s at a height of 36 feet above sea level. Please define the height of the lowest point on the levee above highest high tide. What is the likelihood of this point being overtopped at the end of the facility's expected life when considering projected sea level rise, high highest tide, storm surge, erosion, and seismic uplift or subsidence?

Also, the DEIS does not define whether these levees are certified by FEMA to withstand a 1% annual chance of flood. Please state whether the levees are - or are not - FEMA certified. If not, the levees should not be considered as protective against inundation. The project area is currently in Zone X, which may be inundated by up to 1 foot of water in a 100 year flood. How will this change by the end of the facility's life when considering projected sea level rise, highest high tide, storm surge, erosion, and seismic uplift or subsidence?

- If the levees are not currently certified by FEMA to withstand a 1% annual chance of historic flood, please provide appropriate mitigation measures.
- If, given climate change impacts, the risk of levee overtopping at the end of the facility's life is greater than 1% annual chance, please provide appropriate mitigation measures.

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[1] Goldfinger, C. et al. 2012. Turbidite Event History: Methods and Implications for Holocene Paleoseismicity of the Cascadia Subduction Zone. USGS Prof. Pap. 1661-F. USGS, Reston, Virginia.

Water Quality; Section 4.5, Page 20
This section provides minimal description of initial and periodic maintenance dredging impacts and should provide more specifics on the impacts to water quality at the site. The FEIS should also address the rate at which contaminants from upriver may deposit in the dredged area and whether this is a concern for biota that occupy this area.

Water Quality; Section 5.7 4
Table 5.7-2 identifies the storage and loading of coal onto vessels as having potential to generate coal dust emissions. The document states that the stockpile area and vessel-loading conveyors would not be enclosed due to operational requirements. The ecological impacts of coal dust is discussed on page 5.7-14 of the document; however, the analysis focuses on bioavailability of the chemical constituents based on U.S. EPA standards. The potential impacts of these sources on the aquatic lands below and adjacent to the dock were not analyzed. The analysis does not address the potential impacts of potential smothering or shading of benthic habitats associated with coal dust deposition into surface waters adjacent to the dock. Page 5.7-17 concludes that monthly coal deposition in the project area would be .31 gm/m2/month. What is the basis of this conclusion, given that at the BC Canadian Roberts Bank coal terminal, coal was shown to compose 10-12% of the sediments in the vicinity of the terminal after 22 years causing anoxic conditions beneath the coating of oxidized coal? How could spills associated with loading of vessels result in potential for additional deposition? How will the buildup of coal onto benthic habitats and state-owned aquatic lands over time be prevented? What measures are in place to prevent the loading spout from overfilling or opening when operating above the deck of the vessel, or in the case of a vessel collision with the dock or other vessel? What procedures will be taken to clean up any spills before they cause damage?

Waves and Prop Scour, Section 4.5
Section 4.5, Pages 26 and 28 identify limited impacts in the turning basin due to use of tugs to maneuver ships into place in correlation to depth of dredged area of 20' to 40'+ depth in this area. The FEIS should provide further details on whether prop scour could impact bank stability of dredged slopes. Will this impact shoreline stability and vegetation? The conclusion in Section 4.5 of the DEIS that vessels calling at Docks 2 and 3 would have sufficient depth to minimize the potential for prop-wash should also be revisited given that the proposed facility will have a depth of 43 feet and 80% of the vessels calling at the facility will be Panamax vessels, apparently with drafts of at least 42 feet (DEIS 2-16 n. 13; Table 4.5-13). The EIS should address dredging, turbidity and scour assuming the largest vessels expected to call at the facility during all river conditions.

Wildlife, Page 4.8-10
The DEIS is inadequate in its description of aquatic species occurring within the proposed project impact area, what are referred as "common species of invertebrates and amphibians" and "Freshwater insects and other invertebrate species (i.e., mollusks, crayfish)". Freshwater mussels in the area include *Anodonta nuttalliana*, *Anodonta californiensis, Anodonta oregonensis.* All occur in the lower reaches of the Columbia and are important species in the ecosystem providing food for fish, mammals and water birds. They are filter feeders and therefore sensitive to levels of turbidity and oxygen. The mussels all require host fish as part of the reproduction cycle so

direct impacts to fin fish from this project indirectly impact these mussels (Nedeau et al, 2004) and should be considered in the EIS.

Dredge Impacts, Section 5.7
It is becoming increasingly clear that carbon is not only stored in terrestrial systems but can also be stored in marine and aquatic sediments and associated marine and aquatic ecosystems. The draft EIS considers the impact of "Vegetation and soil removal" in its estimate of greenhouse emissions from construction, operation, and transportation in Cowlitz County in section 5.8.1.5. The EIS should also consider the potential greenhouse emissions that could arise from the proposed removal of 500,000 cubic yards of sediment and proposed annual dredging.

Surface water and floodplains, Page 4.2-15
The EIS should assess the potential for construction of the project to "redirect sheetflow and potentially lead to localized flooding on or off site" to increase sediment loads and changes in downstream channel sinuosity as both direct and INDIRECT impacts.

Water storage and treatment within the coal storage area discussed on page 15 needs to develop a treatment option for large storm events that eliminates potential discharge of contaminants for existing outfall 002A in to the Columbia River.

Water Quality, Page 4.5-22
The EIS should assess and mitigate for the INDIRECT impacts including continued leaching of creosote associated with the timber pile dikes remaining in the sediment from cut pilings.

Vegetation, Page 4.6-8
Submerged plants are mentioned briefly under a section titled **Open Water** and Columbia water meal is listed as a special status plant species. However, there is no acknowledgement of the important ecological functions that freshwater plants and macrophytes provide for fish and invertebrates using this habitat (Beland et al, 2004).

Vegetation, Page 4.6, Page 5-23
The DEIS does not discuss potential direct or indirect impacts from construction and operations to vegetation from shade. Shading from overwater structures and moored vessels will eliminate suitable habitat for submerged and emergent vegetation in the nearshore. Macrophytes grown on plants provide many of the same benefits to trout and salmon that seagrasses and algae provide in estuaries. Permanent removal of this habitat will impact fish, invertebrates, birds and mammals that feed and find refuge there (Rondorf et al, 2010).

- Under MM VEG-2. Conduct Aquatic Vegetation Surveys Prior to Construction. (p. 4.6-26) DNR recommends that Department of Ecology's "Aquatic Plant Sampling Protocols" (2001) be used for pre-construction aquatic vegetation surveys (found at: https://fortress.wa.gov/ecy/publications/summarypages/0103017.html)
- Under MM VEG-3 and VEG-4. (p. 4.6-26) Additional authorization from DNR would be required for revegetation activities on state-owned aquatic land. Accordingly, DNR recommends that WA DNR's Aquatic Resources Division be involved in any revegetation plan (or other habitat mitigation) taking place on or partially on state-owned aquatic lands.

"Proposed Action," Page 4.7-19-21 and "Operations-Direct Impacts," Page 4.7-27
This section discusses the placement of Docks 2 and 3 with respect to shading of habitats. In order to off-set (mitigate) for the loss or degradation of aquatic habitat and negative impacts to species due to increase of overwater structures (piles, conveyor, and two docks), there needs to be additional measures taken to avoid or minimize such impacts to existing aquatic habitat and species. These measures need to be analyzed in the FEIS to determine whether they will mitigate significant impacts.

"Potential Mitigation Measures," Page 4.7-35
There was mention of additional measures that may be provided by "project design measures, best management practices, and compliance with environmental permits, plans, and authorizations that are assumed as part of the Proposed Action", as well as any measures included under Section 7 of the federal ESA with both the USFWS and the NMFS. Early coordination with the regulatory agencies and WA DNR is recommended to provide a well-planned and comprehensive project mitigation plan.

Fish, Page 4.7-22
The DEIS states that the majority of benthic, epibenthic, and infaunal organisms within the proposed dredge prism would be removed during dredging. It then states: "Recolonization by benthic, epibenthic and infaunal organisms would be rapid, and disturbed habitats would return to reference conditions following recolonization by benthic organisms" within 30-45 days. This is not true if the dredge prism is habitat for lamprey ammoceotes. Rapid recovery would be unlikely (USFW, 2008. Jolley et al, 2010). The FEIS should consider these more permanent impacts to lamprey habitat. The FEIS should also address the ability of epibenthic and infaunal organisms to persist under the regular maintenance dredging proposed for the facility.

The FEIS should also address the effect of propeller scour on recolonization. Section 4.5-28 of the DEIS notes that "the likelihood of temporary, localized increases in turbidity resulting from propeller wash is considered low based on the amount of dredging anticipated to be required to accommodate vessels at Docks 2 and 3." This suggests a relationship between the amount of dredging required and propeller induced disturbance of sediments that should be further explained. How often will maintenance dredging need to occur to minimize propeller scour from the largest vessels expected to call at the facility? The conclusion in Section 4.5 of the DEIS that vessels calling at Docks 2 and 3 would have sufficient depth to minimize the potential for prop-wash should also be revisited given that the proposed facility will have a depth of 43 feet and 80% of the vessels calling at the facility will be Panamax vessels, apparently with drafts of at least 42 feet (DEIS 2-16 n. 13; Table 4.5-13). The FEIS should address dredging, turbidity and scour assuming the largest vessels expected to call at the facility during all river conditions.

Under: "Cause Physical or Behavioral Reponses from Elevated Turbidity during Pile Driving and Dredge Disposal" (p. 4.7-23) - "The temporary increase in turbidity from the Proposed Action is expected to be short-term and would not result in chronic sediment delivery to adjacent waters. Construction-related dredging is proposed to occur from August 1 through December 31, when many fish species would be present in the study area." The FEIS should identify what methods will be employed to minimize impacts to fish present in the study area during this time frame, including a modified in-water work window (for example).

Under: "Operations—Indirect Impacts" (subsection),"Cause Fish Stranding from Vessel Wakes"(p. 4.7-31) - Under: "Fish Stranding" (p. 4.7-19) and "Operations—Indirect Impacts" (subsection),"Cause Fish Stranding from Vessel Wakes" (p. 4.7-31). "The Proposed Action would add 840 vessel transits to the Columbia River at full build-out, which would introduce additional permanent risk of fish stranding in the Columbia River. The document uses information for Barlow Point. However, Barlow Point is directly downstream from the Proposed Action and vessels would be slowing as they approach the docks and accelerating as they leave the docks, which could reduce the size of vessel wakes generated by vessels associated with the Proposed Action at Barlow Point. Other sites downstream of Barlow Point would be susceptible to increased risk of fish stranding because of the vessels associated with the Proposed Action" (p. 4.7-19). "Thus, it is likely that fish stranding associated with wakes from project–related vessels would occur because of the Proposed Action."(p. 4.7-32).

The FEIS should identify what shipping action associated with the proposed project (i.e., vessel portage timing) can take place to minimize fish strandings and how and to what level stranding can be mitigated.

Fish, Page 4.7-29

It is an inadequate argument to claim 'direct impacts resulting from a spill … would likely be minor because the amount … spilled would be relatively small.' Coal dust spills during transport are not uncommon. If a spill occurs when salmonids or eulachon are present, lethal and sublethal results are likely from dust clogging or abrading gills or increased turbidity impacting successful feeding, prey aversion and movement. An increase in concentration of suspended material from a spill or accumulated over time impacts benthic and epibenthic invertebrates – many that are important prey for these fish (Gregory, 2011. Bash et al, 2001. Newcomb and MacDonald, 1991).

Fish, Page 4.7-36:

The DEIS notes that "[d]redging in the Columbia River is identified as an activity of concern for eulachon conservation because this activity takes place in proximity to known and potential eulachon habitats. Dredging activities during the migratory and spawning period could entrain and kill adult fish, eggs, and larvae; bury and smother incubating eggs; or cause stress and disturbance that could contribute to decreased spawning success. (DEIS 4.7-15)." Given that dredging required by the project which may occur annually or more frequently as needed, (DEIS 4.7-32) and the potential for propeller scour from day-to-day operations, the description of proposed mitigation to protect Eulachon in DEIS Section 4.7-36 (surveys and future development of mitigation) is inadequate. Mitigation measures that are part of a proposal should be described in the FEIS. WAC 197-11-440(5)(c), 6(b), Without a description of what potential mitigation would be, agencies with jurisdiction cannot evaluate whether proposed mitigation would be sufficient, permissible, or otherwise capable of being accomplished.

Wildlife, Page 4.8-17

DNR disagrees with the conclusion in the DEIS that although mortality to amphibians will occur, "these species typically reproduce rapidly and any losses due to mortality would not be expected to affect the viability or fitness of the species' populations." In fact, although amphibians have existed over 300 million years, in just the last two decades over 170 species have gone extinct and 45% of the existing species have populations that are declining. Since amphibians lay eggs

along river banks that float on water surface, successful reproduction is threatened by direct impacts during construction, during dredging, from coal dust and vessel traffic as well as from indirect impacts from changes to water quality (Stuart et al, 2004).

Vessel Traffic- Section 5- Vessel Transportation and Vessel Transportation Technical Report and Section 6-23 Cumulative Impacts

The summary in the Vessel Transportation Section 5.4-35 states that there will be 1,680 vessel transits per year. To meet this standard, two vessels will need to be loaded per day 365 days a year. The FEIS should assess how malfunctions in and/or maintenance to loading mechanisms might slow this process and affect vessel traffic congestion. Additional concerns related to vessel congestion are based on the apparent size of the vessels that would call on the proposed facility. The DEIS provides that 80% of the vessels calling at the facility would be Panamax-class vessels, which, as described in the DEIS, have a draft of at least 42 feet (DEIS 2-16 n. 13). (See also Table 5.4-13 identifying the representative draft of Panamax vessels to be 13.3 meters, which is 43.6 feet.) The federal navigation channel in Columbia River is currently maintained at 43 feet except as limited by temporary shoaling. The Columbia River Harbor Safety Plan calls for all vessel movements to be planned to maintain an under keel clearance of at least 2 feet. As a result, the Columbia River Pilots' Vessel Movement Guidelines note that ships with a draft of 43 feet may be subject to substantial delays while transiting the river and at the Columbia River bar awaiting the proper tide and river levels to be present. Given that the proposal calls for 1344 additional Panamax-class vessel trips per year the EIS should examine the effect of scheduling the transits of largest vessels expected to call on the facility and the likely delays in those transits on vessel congestion on the river and associated risk of congestion related allisions (running one ship in another ship that is stationary), collisions, and groundings. The EIS should also describe air quality impacts related to congestion and how the risk of vessel congestion will be mitigated for.

<u>Chapter 6 Cumulative Impacts</u>

Water quality, vegetation, fish, wildlife from operations effects particularly from emissions of coal dust, continued maintenance dredging, shading from overwater structures and vessels (as described in the comments regarding Chapters 4 and 5) would only be more pronounced when considered cumulatively and should be assessed in the FEIS.

IMPACTS TO STATE-MANAGED LANDS IN THE LOWER COLUMBIA REGION

Chapter 4 Natural Environment

Geology and soils, Page 4.1-15

The DEIS suggests there is little risk of the operations of the project causing landslides but does not consider the potential increase in Columbia River bank failure, slumping or erosion from the increased in large vessel transport. This is a continuing issue in the lower Columbia, particularly in areas of Wahkiakum County (Babcock, 1989 & Wahkiakum County) and should be assessed in the FEIS.

Chapter 4 Natural Environment

Geology and Soils, Page 4.1-15

Landslides: Increased wet season precipitation and increased frequency and magnitude of extreme storms due to climate change is projected to increase the frequency of landslides. Please assess the likelihood of additional landslides on the project area and rail lines along the entire rail route or routes. If an increased likelihood of landslides is found, please assess the effect on the likelihood of derailment and spills into the Columbia River or other state-owned aquatic land or state-owned upland.

- If additional risk is identified, please provide appropriate mitigation measures for the Project Area and all relevant rail routes.

Water Quality, Page 4.5-23

The estimated deposition rate of 1.88 g/m2/year of coal dust input to the Columbia River and surrounding assumes no spills. This is an unrealistic assumption. BNSF estimates that 500 lbs. to a ton of coal can escape from a single loaded coal car. A recent examination of coal dust emissions from coal rail cars traveling through Washington indicate higher than anticipated emissions of coal dust, even though surfactants had been applied to control the dust (Johnson & Bustin 2006; Jaffe et al 2015). The FEIS should revise their deposition rate estimates to reflect these studies.

Water Quality, Page 4.5-25

Depending on the abundance of sulfide minerals in the coal, local acidification can result from coal dust entering water along the Columbia River. Although sulfur is not listed in Table 4.5-4 as an element of environmental concern, the Powder River Basin and Wyodak coal beds do contain sulfur (Stricker and Ellis, 1999) and should be considered in assessing water quality impacts in the FEIS.

Water Quality, Page 4.5-26

In order to fully address "water quality concerns" and other environmental issues, long-term effects need to be evaluated; including the potential for bioaccumulation. Coal dust suppressants should be evaluated in both freshly applied as well as aged and weathered forms. The potential for synergistic effects with coal dust should be examined in the FEIS (Tien and Kim, 1997; U.S. EPA, 2002).

Ocean Acidification
The SEPA Climate Change Technical Report claims that ocean acidification does not affect the project area. This is not true given that marine waters periodically reach the project area with shifting tides and should be assessed in the FEIS.

Fish, Page 4.7-29
It is an inadequate argument to claim 'direct impacts resulting from a spill … would likely be minor because the amount … spilled would be relatively small.' Coal dust spills during transport are not uncommon. If a spill occurs when salmonids or eulachon are present, lethal and sublethal results are likely from dust clogging or abrading gills or increased turbidity impacting successful feeding, prey aversion and movement. An increase in concentration of suspended material from a spill or accumulated over time impacts benthic and epibenthic invertebrates – many that are important prey for these fish (Gregory, 2011. Bash et al, 2001. Newcomb and MacDonald, 1991).

Fish, Page 4.7-29
The DEIS identified that source sound levels generated by the type of bulk carrier vessels transiting the Columbia River "*…exceed identified thresholds for potential behavioral disturbance for fish and may cause avoidance or other behavioral responses.*" In addition to making fish more vulnerable to predation, avoidance behavior creates additional stressors that are not assessed in the DEIS.

Section 4.7.7.1 Applicant Mitigation states; "*There would be no unavoidable and significant adverse impacts.*" Considering a substantial number of large vessels would be adding to commercial traffic on the river (70 additional vessels per month, an increase of 44%) the DEIS completely neglects to assess potential impacts to fish as a result of the increase in bulk carrier traffic that will call on the new facility and does not support the conclusions of Section 4.7.7.1.

The DEIS (page 4.7-16) identifies the prominence of both green and white sturgeon as bottom feeders throughout the lower Columbia River. White sturgeon in particular use "*…a wide variety of habitats.*" The lower Columbia River navigation channel is dredged to 43 foot depth. Panamax and Handymax class vessels have a draft of 36 feet and greater (DEIS Table 5.4-5) and are moving between 9 and 15 knots (DEIS, page 5.4-16). There appears to be a reasonable chance that the 1,680 annual additional vessel transits to and from the Millennium pier will be moving in very close proximity to the river bottom where both green and white sturgeon are likely to be present. Beyond recognizing the prominent occurrence of sturgeon and other fish in the area where shipping occurs, there is no discussion on the physical impacts to the fish. The DEIS should assess the potential extent of impacts of strikes from propellers and direct ship contact to fish, particularly sturgeon, and the extent that the increase in ship traffic noise increases stress levels of fish, breaks up schools and causes increased energy expenditure due to movement away from the disturbance, and how these impacts, if any, will be avoided and minimized.

Wildlife, Page 4.8-17
DNR disagrees with the conclusion in the DEIS that although mortality to amphibians will occur "these species typically reproduce rapidly and any losses due to mortality would not be expected

to affect the viability or fitness of the species' populations." In fact, although amphibians have existed over 300 million years, in just the last two decades over 170 species have gone extinct and 45% of the existing species have populations that are declining. Since amphibians lay eggs along river banks that float on water surface, successful reproduction is threatened by direct impacts during construction, during dredging, from coal dust and vessel traffic as well as from indirect impacts from changes to water quality (Stuart et al, 2004).

Vessel Transportation, Section 5.4.4.3

Section 5.4.4.3, Ship Casualty Survey (page 5.4-30) does not discuss commercial traffic incidents with recreational or commercial fishing vessels or projected increases with increased traffic and ship size. Same for the ability of Incident Management and Response Systems (page 5.4-32) to deal with increased traffic and larger ships (2,258 by 2028 and, from 3,862 current to 6,120 in 2028 table 5.4-14). The DEIS states: "Although vessel traffic volumes have been considerably lower over the past 11 years compared to the earlier peak years, vessel sizes and total cargo tonnages have increased in recent years" (page 5.4-19). "In general, the risks of spills would increase under the Proposed Action due to an increase in the number of vessels calling at the project area and the resultant increase to overall vessel traffic in the study area" (page 5.4.-43). "Although the likelihood of a serious incident is very low, there are no mitigation measures that can completely eliminate the possibility of an incident or the resulting impacts" (page 5.4-47). The FEIS should assess these potential impacts. As stated above, impacts related to vessel congestion should also be analyzed assuming the largest vessels expected to call on the facility and necessary delays associated with scheduling the transits of those vessels on the river.

Section 5.4.3.2 Impact Analysis

Regardless of where vessels refuel the risk of spills while bunkering is significant and the increased risk posed by increased bunkering required as a result of this proposal should be identified and quantified. Furthermore, potential mitigation measures should be identified and list what the proponent will do to mitigate reduce risk of bunkering spill.

Chapter 6-Cummulative Impacts

The Vessel Traffic Study needs to be further enhanced and presented as part of the DEIS providing more solid statistics on the level of risk posed by this action as well as mitigation measures that can be implemented to reduce imposed risk. These may include but are not limited to:

1. The need for tug escorts;
2. Improved vessel-traffic management and practices and;
3. Enhancing requirements for tug capabilities (including propulsion, equipment and operations) to ensure safe escort of vessels.

Appendix F: Rail and Vessel Corridor Information

The Draft EIS does not address the capacity of the existing vessel traffic management system to manage the risks associated with the projected cumulative increases in deep-draft vessel transits. The 1,680 deep draft vessel transits associated with the proposal represent a 44% increase over 2014 conditions, with projected cumulative 2028 and 2038 levels representing a 58% and 118% increase respectively. The risk associated with a significant increase in large commercial vessels transits is magnified by the potential for a parallel increase in oil transportation in the Columbia

River system. Although the "return period" for large scale accidents and/or spills is modeled to be relatively low, a large scale oil spill would have significant and long-term adverse impacts to state-owned aquatic lands and the larger lower Columbia River estuary ecosystem.

The recent Tesoro Savage Vancouver Energy Project Draft EIS indicated that the current lower Columbia navigation system had capacity to handle approximately 3,644 annual deep draft vessel transits.[2] Both the cumulative 2028 and 2038 projections associated with the Millennium Draft EIS significantly exceed this figure. The Final EIS should address existing vessel traffic management system capacity and identify necessary improvements to expand capabilities (e.g., available pilots and tug escorts) to ensure appropriate safeguards are in place. The Final EIS should also acknowledge the pending Department of Ecology evaluation of the vessel traffic management and safety within and near the mouth of the Columbia River (Section 11, Chapter 274, Laws of 2015). See Ecology's website (http://www.ecy.wa.gov/news/2016/025.html) for further details. It is speculative to imply that existing systems and capabilities are adequate until this study is completed. Although many recommendations from this study may pertain specifically to oil transportation, the Final EIS should adopt all relevant recommendations of this evaluation. Analyses should statistically compare potential increased vessel traffic from proposed oil transportation facilities along the Columbia (Tesoro-Savage EIS and others-see Table 6.2) with levels of traffic proposed and quantify increased level of spill risks posed, as well as any mitigation measures that should be recommended. Provide statistically significant results and potential volumes that could be released as a result of an incident whether it be a collision, allision, grounding, bunkering issue or otherwise. Although the summary states that risks were quantified, very little statistics are referenced throughout this report instead using broad terms such as 'low risk' and 'low probability' of a spill. In the summary and wherever risk of a spill is mentioned, risk should be described in terms of how often (every however many years) and number of potential gallons that could be spilled. Simplifying by only saying "low risk" trivializes the catastrophic impact a spill from these large vessels could have on the Columbia River's diverse and sensitive habitats adjacent to and downriver from this facility. The DEIS needs to provide in more definite terms the risk this proposal poses.

Vessel Wake

Projected project related and cumulative increases (44% and 118% increase above 2014 levels) in deep draft vessel traffic within the Lower Columbia River present potentially significant challenges for juvenile salmon. Existing levels of deep draft vessel wakes currently contribute to stranding of juvenile salmonids within the lower estuary and are identified as a limiting factor in the Lower Columbia River Recovery Plan for Salmon and Steelhead. Approximately 33 miles of the lower river have been identified as having shoreline characteristics that suggest vulnerability to wake induced stranding events. The Recovery Plan classifies the level of impact to juvenile ocean-type fry as a moderate population level effect; however, this is prior to projected increases in deep draft vessel transits. No estuary-wide estimates of mortality have been completed and additional research is needed to understand the full extent of this issue.

Given that wakes from deep draft vessels have been linked to observed stranding events, the FEIS should clearly differentiate between deep-draft vessel trips and total commercial vessels

[2] Tesoro Savage Vancouver Energy Distribution Terminal Facility Draft Environmental Impact Statement, November 2015; Ch3.14-31.

under both projected and baseline conditions to facilitate comparison of the potential impacts to ESA listed salmonids. The Lower Columbia Recovery Plan suggests that options for limiting the impact of vessel wake stranding are limited due to (1) potential loss of revenue that would result from speed reductions; and (2) the high costs associated with potential habitat modifications. If no mitigation is proposed – none is currently identified in the DEIS – then vessel wake induced stranding may warrant disclosure as an "unavoidable and significant adverse environmental impact" and compensatory mitigation measures proposed that include an assessment of the commercial and cultural value lost due to the impacts.

IMPACTS TO STATE-MANAGED LANDS STATEWIDE

Ocean Acidification

Ocean acidification and changes to marine and freshwater chemistry are of significant concern to the health of the environment. The analysis of the impacts from burning 44 million metric tons of coal per year on ocean acidification is overly simplified and does not appropriately consider potential cumulative impacts. Coal combustion produces many products including CO2, NOx and SO2. Nitrogen oxides and sulfur dioxide will transform in the atmosphere to strong acids such as nitric acid and sulfuric acid (HNO3 and H2SO4) that can affect the carbonate chemistry of marine waters. Further the term 'ocean acidification' overly simplifies the true complexity of the carbonate system which includes parameters such as dissolved inorganic carbon (DIC), alkalinity, pCO2, and pH. This should be a consideration in the FEIS.

More attention should be given to the impacts of burning 44 million metric tons of coal per year will have on carbonate chemistry globally, along coastlines adjacent to the project area and the potential cumulative biological impacts. There is a growing body of literature highlighting the impacts that ocean acidification may have on species that are both culturally, commercially and ecologically significant to the Pacific Northwest. This includes, but is not limited to, salmon, pteropod, shellfish and some harmful algal bloom forming species of diatoms and dinoflagellates. There should be a discussion of the cumulative impacts ocean acidification may have on the natural environment.

Anthropogenic climate change will likely cause moderate to severe declines in most west coast salmon, especially when interacting factors are incorporated into the analysis (e.g., existing threats to populations, water diversion, accelerated mobilization of contaminants, hypoxia, and invasive species). Salmon will adapt their behavior and possibly physiology, but these responses are unlikely to prevent long-term declines (NMFS, August 2015).

<u>Chapter 4 Natural Environment</u>

Vegetation, Page 4.6-22

The DEIS states impacts of coal dust on vegetation are variable and complex and have not been studied in the Pacific Northwest. Coal dust has been shown to reduce terrestrial and emergent plants ability to photosynthesize (Farmer, 1993) and should be addressed in the FEIS.

Fish, Page 4.7-29

It is an inadequate argument to claim 'direct impacts resulting from a spill … would likely be minor because the amount … spilled would be relatively small.' Coal dust spills during transport

are not uncommon. If a spill occurs when salmonids or eulachon are present, lethal and sublethal results are likely from dust clogging or abrading gills or increased turbidity impacting successful feeding, prey aversion and movement. An increase in concentration of suspended material from a spill or accumulated over time impacts benthic and epibenthic invertebrates – many that are important prey for these fish (Gregory, 2011. Bash et al, 2001. Newcomb and MacDonald, 1991).

Wildlife, Page 4.8-17

DNR disagrees with the conclusion in the DEIS that although mortality to amphibians will occur "these species typically reproduce rapidly and any losses due to mortality would not be expected to affect the viability or fitness of the species' populations." In fact, although amphibians have existed over 300 million years, in just the last two decades over 170 species have gone extinct and 45% of the existing species have populations that are declining. Since amphibians lay eggs along river banks that float on water surface, successful reproduction is threatened by direct impacts during construction, during dredging, from coal dust and vessel traffic as well as from indirect impacts from changes to water quality (Stuart et al, 2004).

Chapter 5 Operations

Rail Transportation, Section 5.1

DEIS Section 5.1.8 states: "*Without improvements to increase capacity the rail line routs for the proposed action (the Reynolds Lead; BNSF Spur; and three segments on the BNSF main line routes in Washington State (Idaho/Washington State Line–Spokane, Spokane– Pasco, and Pasco–Vancouver) are not projected to have the capacity to handle the projected baseline rail traffic and Proposed Action-related rail traffic in 2028. BNSF could address capacity issues with capital improvements or operational changes, but it is unknown when these actions would be taken or permitted. Therefore, with existing infrastructure and using the methods to identify potential baseline rail traffic in 2028, the Proposed Action could result in a significant adverse environmental impact on rail transportation.*"

The economic effects of these impacts on the ability of state agriculture products to get to market is not considered in the discussion. The FEIS should discuss how current and future rail line capacity needs will affect current state agricultural markets and the ability for getting Washington's agriculture crops to market using the current rail infrastructure.

Rail Safety, Section 5.2

Existing rail transportation is a consistent cause of wildland fires due to sparks emitted from train wheels in contact with rail tracks. Rail spark emissions can – and regularly do – ignite fires in vegetation adjacent to rail lines. The DEIS does not address the increase in numbers of wildfire starts that are likely due to the additional 16 "unit trains" (125 rail cars each) per day. The rail lines designated for transporting coal from markets and for empty-car backhauls traverse areas of the state that are particularly wildfire-prone, especially during extended periods of hot dry conditions. The empty backhaul route for BNSF trains moves east over Stampede Pass, an area that is remote and difficult to access for wildfire response. The DEIS should address likely increases in wildfires and potential mitigation for wildfire risk due to the increase in rail traffic.

Also missing from the Rail Safety section was any mention or analysis of increased need for emergency response in the event of a derailment, accident or spill along the rail transportation routes. DNR's Wildfire Program serves a statewide Emergency Support Function (ESF 4) for not only wildfires, but all-hazards emergency response with incident command and response resources if needed. The potential increase in emergency response (in which DNR and other emergency response agencies may have significant roles) along the rail transportation routes should be acknowledged, and potential mitigation should be addressed in the FEIS.

Coal Dust, Page 5.7-2

Compared to other measures of coal dust from rail cars and accumulation of coal dust at sites 5 miles away, as has been observed at the Point Roberts terminal in Canada, the application of surfactants to control dust adds the impacts from these chemicals when coal dust is blown or spilled during transport (Jaffe et al, 2015. Johnson & Bustin, 2006). This impact should also be assessed. In addition, there should be an analysis of the potential health and environmental effects from resuspension of accumulated coal dust from regular rail traffic.

The DEIS does not include an analysis of urban forest health along potential rail routes. The following mitigation, restoration and enhancement activities should be considered in the FEIS:

- It is difficult to predict the amount of cumulative coal dust deposition on vegetation or how that will affect trees within the impact area. The report states that dust will be minimized through mitigation techniques and that the dust emission will be below an unacceptable level. There does not appear to be a monitoring plan in place to determine impact, or to mitigate impacts should they be discovered. A monitoring plan should be developed in urban areas to assure the health of urban trees and address issues that may arise.
- Adjacent to the project area, there should be consideration of the potential to plant a large-tree vegetative screen to aesthetically enhance the area, help to capture aerial dust, and act as a sound and light barrier between the project site and residential areas.
- Since vegetation will be maintained along the perimeter road, rail tracks, and rail loop, the loss of trees could be mitigated by planting trees, monitored through establishment, on the outside of the maintenance perimeter, particularly in proximity to residential areas.

Greenhouse Gas Emissions and Climate Change, Page 5.8-1-33

There has been significant investment by Washington state natural resource agencies and Tribal governments to plan for, investigate and respond to the following effects of climate change. For example; DNR is building and deploying ocean acidification sensor packages throughout the nearshore waters of WA to collect data on pH and water quality changes resulting from climate change that affect ecologically and commercially important species. DNR is also investigating the potential to strategically culture aquatic plants to increase pH of acidified waters. These efforts and investments of citizen dollars and further investments by state and local government required to respond to continued production of greenhouse gases should be considered in the project's economic analysis.

The projected 37.6 million metric tons of greenhouse gas emissions associated with facility construction and operation over a 20-year period is inconsistent with state policy[3] to reduce fossil fuel dependence, promote clean energy technologies, and mitigate the potential for catastrophic and irreversible impacts to natural resources. Global climate change presents serious environmental challenges including, but not limited to, ocean acidification, sea level rise, warming water temperatures, decreased snowpack, and increased wildfire danger. Climate change is already having profound ecological and economic consequences in the region. Human contributions to ocean acidification in the Pacific Northwest are quantifiable and have increased the frequency, intensity, and duration of harmful conditions.[4] Washington marine waters and ecosystems are identified as "particularly vulnerable" to the effects of ocean acidification – a fact emphasized by recent larvae production failures at Pacific Northwest oyster hatcheries.[5] These waters support a $270 million aquaculture industry and a larger $1.7 billion seafood industry. Although the DEIS proposes to mitigate 50% of associated emissions, the financial and technological feasibility of achieving reductions of that scale is unknown at this time since the mitigation plan has yet to be developed. All unmitigated large-scale greenhouse gas emissions associated with coal exports will be at odds with the 2012 Washington State Blue Ribbon Panel on Ocean Acidification recommendations to address the causes and consequences of ocean acidification.

The DEIS states, "Washington State law requires annual greenhouse gas emissions to be reduced to 1990 levels (88.4 million metric tons of CO2e) by 2020 (Revised Code of Washington [RCW] 70.235.050). The Washington State goal represents an annual reduction of 3.6 million metric tons of CO2e below the 2012 state emissions levels. The statewide annual emissions associated with the Proposed Action under the 2015 Energy Policy scenario is approximately 0.4 million metric ton of CO2e and represents about 11% of the emissions reduction goal."

Please note that the DEIS text only discusses emission reduction obligations for 2020. However, the state is obligated to continue reducing over time, to 25% below 1990 levels by 2035, and to 5 below 1990 levels by 2050.

- The DEIS statement that the Proposed Action represents 11% of the emissions goal is incorrect in two ways. First, it represents an increase of 11% at the 2020 mark (not 11% of the reduction goal). Second, because the State's emissions reduction obligation is progressive, the Proposed Action represents an increasing proportion of the state's carbon emissions over time. Please calculate this amount at relevant time steps throughout the life of the Proposed Project.

- **MM GHG-4. Mitigate for Impacts on Washington State from Net Greenhouse Gas Emissions Attributable to the Proposed Action.** The calculations for this section should

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[3] Executive Order 14-04 *Washington Carbon Pollution Reduction & Clean Energy Action* and Executive Order 12-07 *Washington Response to Ocean Acidification.*

[4] NANOOS, NOAA Ocean Acidification Program, Ocean Carbon & Biogeochemistry Project; UW Washington Ocean Acidification Center, Washington Sea Grant, and West Coast Ocean Acidification & Hyoxia Science Panel. Ocean Acidification in the Pacific Northwest. May 2014.

[5] Washington State Blue Ribbon Panel on Ocean Acidification (2012): Ocean Acidification: From Knowledge to Action, Washington State's Strategic Response. H. Adelsman and L. Whitely Binder (eds). Washington Department of Ecology, Olympia, Washington. Publication no. 12-01-015.

reflect the proposed project's increasing percentage of the state's carbon emissions over time, and thus the increasing mitigation rate that is necessary to mitigate for it.

NEPA draft guidelines can provide a frame of reference into important issues that should be analyzed in an environmental review process. And although not required under SEPA, doing so in the DEIS would be a good idea and in the best interest of the public. Agencies can incorporate by reference applicable agency emissions targets such as applicable federal, state, tribal, or local goals for GHG emission reductions to provide a frame of reference and make it clear whether the emissions being discussed are consistent with such goals.

For proposed projects emitting more than 25,000 metric tons of carbon dioxide equivalent, federal NEPA greenhouse gas and climate change draft guidance (Dec 2014) supports quantitative assessments of both the potential effects of a proposed action on climate change as indicated by its GHG emissions; and the implications of climate change for the environmental effects of a proposed action. The DEIS estimates that the total net emissions related to the proposed project from 2018 to 2038 would be 37.6 million metric tons of CO2e. This is above the threshold of 25 million metric tons of CO2e, indicating that climate change should be considered by the FEIS. Thus, these comments reflect considerations for assessing the proposed project's GHG emissions and the implications of climate change of the proposed action. The FEIS analysis should consider utilizing the following NEPA guidelines when assessing GHG emission impacts:

1. When assessing direct and indirect climate change effects, agencies should take account of the proposed action – including "connected" actions – subject to reasonable limits based on feasibility and practicality. In addition, emissions from activities that have a reasonably close causal relationship to the federal action, such as those that may occur as a predicate for the agency action (often referred to as upstream emissions) and as a consequence of the agency action (often referred to as downstream emissions) should be accounted for in the NEPA analysis.

    a. It is unclear if the DEIS considers the full range of "connected" actions when assessing GHG emissions from construction, operation, and use of the coal in Asia. Please clarify and ensure that the full range of connected actions are considered.

2. Monetizing costs and benefits is appropriate in some cases and is not a new requirement.

    a. For DNR and Washington State, an example of the cost of climate change is it being considered a contributing factor to the 2015 Wildfire season, during which more than 1 million acres burned in Washington and the total firefighting cost was at least $347 million.
    b. Additional climate related costs to the state include losses due to the 2015 drought, losses from flooding due to increased peak flows, and protections from sea level rise.
    c. Please consider all of these costs in the FEIS.

3. The "Federal social cost of carbon" offers a harmonized, interagency metric that can provide decision makers and the public with some context for meaningful NEPA review.

a. The DEIS does not provide an assessment of the social costs of carbon for the proposed project. Please include this in the FEIS.

5.8.2.8: Climate Change impacts:
The implications of impacts addressed in this section (e.g., low flow, high flow, flood inundation, and wildfire) should be included in the previous sections assessing these issues (especially Section 4). These impacts are relevant to the assessment of the project and should not be separated. Please consider climate conditions and impacts through the end of the project's life to assess risks for the project.

In addition, please address the following:

- Increased landslides due to climate change impacts, including increased wet season precipitation and increased frequency and magnitude of extreme storms.
- Effects on hydrological dynamics due to sea level rise, increased peak flow, reduced low flow, increased wave energy, increased scouring, and other water related changes to impact hydrological dynamics over the life of the project
- Effects on point and non-point discharge due to increased frequency and magnitude of extreme storms over the life of the project
- Effects on stormwater and wastewater discharge related to seasonal flow changes due to climate change over life of project. Increased extreme storms can flush toxics in large plumes. Seasonal low flows can reduce dilution, causing increased toxicity.
- Effects on wildfire related to 1) increased ignitions due to increased sparks from rail lines (due to increased rail traffic) and 2) longer, hotter, drier fire season due to climate change.
- Overall, consider changing risk profiles (usually increasing risk) over the life of the project. If the facility may persist beyond the currently defined life of the project, what modifications will be needed to prevent future harm?

In all cases, if the risk of environmental harm increases due to inclusion of these impacts, please provide appropriate mitigation measures. DNR recommends that as the applicant develops a greenhouse gas emissions mitigation plan as discussed in section 5.8, page 22, they consider converting current public facilities that burn fossil fuels to either wood chips or wood pellet heating systems. These funds could be managed by the Washington State Department of Commerce to pay for the conversion of fossil fuel energy systems to wood energy systems at public facilities. This action will have three primary benefits:

1. Converting to wood energy systems will reduce greenhouse gas emissions;
2. utilizing low-grade wood chips or pellets will help provide a market for small trees that must be removed to reduce wildfire risk which they identified as potential risk to the project in 5.8-32; and
3. Combusting woody biomass in efficient, modern boilers will reduce particulate emissions compared to slash pile burning or wildfires.

ADDITIONAL COMMENTS TO THE DEIS FOR CONSIDERATION:
Project Objectives, Proposed Action, and Alternatives

Section 2.1.1 Enable Western U.S. Coal to Compete in the Pacific International Coal Supply Market
Section 2.1.1 states: "*Further development of western U.S. coalfields and the growth of Asian market demand for U.S. coal is expected to continue, and existing West Coast terminals are unavailable to support this need. To derive benefit from economies of scale, implementation of the Proposed Action would provide a coal export terminal sufficient in throughput to give U.S. coal producers the opportunity to expand their share of the international coal market.*"
Section 2.1.2 states: *The Applicant states the Proposed Action would support the diversification of Washington State's trade-based economy by providing a new coal export terminal to accommodate the anticipated growth in demand for the export of U.S. coal.*

The basic assumption on which the project objectives are based, "...demand for U.S. coal is expected to continue..." is no longer valid and should be reassessed based on current market conditions. According to the Energy Information Administration coal exports from the United States are projected to decline significantly over the next few years. According to the EIA, lower overseas mining costs, cheaper overseas transportation costs, and favorable exchange rates are expected to continue to provide a competitive advantage to mines in other major coal-exporting countries. Coal exports in February 2016 were 31% lower than in February 2015. The EIA forecasts U.S. coal exports to decline by 20% in 2016 and by an additional 4% in 2017. Forecast coal production is expected to decrease by 17% in 2016 alone, which would be the largest decline in terms of both tons and percentage since data collection started in 1949. (EIA Short Term Energy Outlook, May 2016). These factors have had a significant impact on coal production in the United States. In January 2016, Arch Coal Inc. which owns 38% of the proposed Millennium facility, filed for bankruptcy (The Wall Street Journal, January 11, 2016) as a result of a major decline in the demand for coal in the Asian market. Since this time, Peabody Energy, the largest coal company in the U.S. also filed for bankruptcy. This followed bankruptcy filings by Alpha Natural Resources Inc., Patriot Coal Corporation and Walter Energy Inc. (The Wall Street Journal, April 14, 2016). Reuters (January 11, 2016) stated; "*Producers accounting for more than 25 percent of U.S. coal are currently in bankruptcy, based on 2013 government figures of major U.S. coal companies' production.*" China and India, both projected to be larger coal consumers of the coal, have lost interest in importing coal and will increase reliance on domestic coal (Crosscut, May 5, 2016). Accordingly, the project objectives should be reassessed based on a realistic evaluation of current and projected future market conditions.

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Chapter 3: Built Environment

Section 3.2: Social and Community Resources
The projection of potential direct, indirect, and induced economic and fiscal benefits of the proposal are based on the 2012 study *Economic and Fiscal Impacts of Millennium Bulk*

Terminals Longview prepared by BERK. (DEIS 3.2-5). The potential direct, indirect and induced economic and fiscal benefits of the proposal should be reassessed based on current information. As noted above, the downturn since 2012 in the outlook for U.S. coal exports and the domestic coal industry generally is well documented and expected to continue for the foreseeable future. According to the Energy Information Administration, for example, there was a 24% decline in coal exports from the United States between 2014 and 2015 alone. (EIA, Quarterly Coal Report, October-December 2015). As discussed above, the rapid decline in coal prices has resulted in a succession of bankruptcy filings by the top coal producers in the United States in 2015 and 2016. Accordingly, projections of benefits from the project based on the substantially more favorable economic outlook for coal in 2012 are misleading and should be re-examined.

Section 3.4: Cultural Resources

A fundamental problem with the DEIS in terms of cultural resources is that it fails to provide data sufficient to judge whether and to what degree there could be adverse effects to archaeological resources and to traditional cultural properties. The DEIS's reliance on reports not included in the Appendix is troubling, and a comparison of methodologies and conclusions as described in the original (which is in fact on file at DAHP) and as characterized in the DEIS shows that the latter includes significant errors and misinterpretations that result in the DEIS under-estimating the potential for archaeological resources and for adverse effects to them.

Based on the AECOM archaeological report, it is clear that there is potential for archaeological deposits as shallow as 1 foot beneath the modern ground surface, well within the reach of conventional archaeological methods. Prior to any action, DNR recommends a much more thorough archaeological investigation, because without that we do not know what is present, and therefore cannot discuss potential adverse effects or mitigations.

<u>Specific comments</u>:

Section 3.4

Categories of cultural resources are inconsistent with National Historic Preservation Act (NHPA) and its regulations in 36CFR800. For reasons not explained, "Traditional Cultural Property" category has been split into "Culturally Significant Property" and "Tribal Resources," the latter being addressed in a different section.

Section 3.4.1

The list of federal laws is limited to the National Register of Historic Places (NRHP), which is a component of the NHPA, but not the entirety. The list omits other potentially relevant laws, including (but not limited to): 36 CFR 800, Archaeological Resources Protection Act, Native American Graves Protection and Relocation Act, American Indian Religious Freedom Act, Abandoned Shipwreck Act, and various Executive Orders.

Section 3.4.2

Since this is a federal undertaking subject to the NHPA, the "Study Area" should be formally defined as an "Area of Potential Effect" (APE). The Study Area fails to include areas subject to potential effect due to terminal construction, such as spoils disposal areas, fill sources (for

example, borrow pits or quarries), and haul routes. If there are in fact no such areas beyond the mapped polygon, this should be stated clearly.

Section 3.4.3.1
There is a series of 1942 aerial orthophotos that should be examined as well. The much-cited AECOM report is not in the appendix, making it difficult to evaluate DEIS summaries and characterizations. The AECOM report shows that geotech corings are unevenly distributed, and do not cover many areas within the study area.

Geotech cores alone are not sufficient to evaluate archaeological potential, especially as the DEIS does not make clear what level of archaeological expertise was brought to bear in their analysis. The AECOM report mentions shovel probes that provide more useful archaeological data than geotech cores, but these results are omitted from the DEIS. An "archaeological work plan" is mentioned, but none of its elements are described. Later in the DEIS, it appears that there are no plans for further archaeological investigation prior to construction.

Section 3.4.3.2
The cited model is insufficient to address effects in the water and in certain portions of the study area due to absence of geotech coring data in those areas. The phrase "indicated potential for direct impacts on cultural resources" is left unexplained, yet leaves wide latitude for concern.

Section 3.4.4.1
Throughout this section, there is a failure to relate the contexts to the project area. What do the known prehistoric, ethnographic, and historic contexts mean in terms of archaeological expectations in the project area? What kinds of artifacts and features might be expected, and from which time periods?

The prehistoric context lists several phases based on lithic artifacts, but fails to mention that the Columbia River was one of if not the most heavily populated areas in prehistoric North America. The full range of site types could be present, dating back to over 14,000 years ago. This section skips some of the best information from the AECOM report. In particular, there is a gap between 1850s settlement (no mention of the adjacent Donation Land Claim, for instance) and industrialization in the 20th Century.

Section 3.4.4.2
It is difficult to understand how landfills and fill deposits were determined NRHP eligible. Text mentions that USGS and GLO maps support the interpretation that the project area was formerly a wetland, but fails to show this with georeferenced overlay maps. The text should be revised to say Holocene Epoch (not "epic").

Conclusions about the depositional environment as described in this DEIS are internally contradictory. For example, the documents states there is no evidence of soil formation within the 70 feet of alluvium, but then states that soil characteristics indicate that it was a wetland.

The FEIS departs from data included in the AECOM report with regard to the potential for buried soil horizons, which are settings in which archaeological materials are more likely, and

where impacts could be most adverse. The AECOM report mentions layers that appear to be buried stable surfaces at 1-2 feet below current ground surface, but the DEIS omits these references, states there is no evidence of soil development, and states that the shallowest expressions of native (non-fill) sediment is 5-10 feet below current ground surface.

Both the AECOM report and the DEIS claim a diminished potential for cultural resources in the area based on the conclusion that it was a wetland, but they fail to address two key questions: Was the area a seasonal or year-round wetland? And is there evidence that the wetland was present throughout the span of potential human presence in the area? Seasonality and antiquity of the supposed wetland both have implications for archaeological expectations. There is mention that some organic layers were dated radiometrically, but no mention of the results.

Section 3.4.4.4
There is no such category as "culturally significant properties" in a Section 106 evaluation.

Section 3.4.4.5
Rail and vessel corridors include a long stretch of the Columbia River and its shorelines. This was a major prehistoric population center, and nearly the full range of site types could be present. This section does not communicate this information and should be addressed in the analysis.

Section 3.4.5
Besides the potential that the area was not a wetland throughout the Holocene or during all seasons, the DEIS fails to recognize that wetlands and river bedlands have potential for several types of archaeological sites, including fish weirs and traps, marsh gardens, and accumulations of sinker stones. The DEIS says that none of the activities with potential for impact would "yield sediment for observation," yet states that an Unanticipated Discovery Plan (UDP) would be implemented, and in a later section says that archaeological monitoring would be done.
The DEIS says that there cannot be indirect construction impacts, since construction will be limited to the project area. As mentioned previously, it is likely that the real APE will include additional areas due to fill introduction, spoils dumping, and haul routes, at a minimum.
The DEIS implies that an UDP will resolve any direct impacts from operations, but is unclear how. The discussion of operational direct impacts fails to address underwater effects such as dredging, wakes, moorage or anchoring, and prop wash. The discussion of operational indirect impacts fails to address sea level rise as all this coal is burned. On a more immediate level, the effects of coal dust as carbon introduced into archaeological sites would be to complicate and perhaps preclude radiometric dating. The operational indirect impacts were "assessed qualitatively," but there is no explanation of what that means, or which qualities were used.
As noted in the comments regarding Section 3.4.4.5 above, the Rail Corridor impacts section fails to address the potential effects of coal dust (see radiometric dating comment above) or of derailments on the pervasive nature of archeological significant sites along the proposed rail routes. The Vessel Corridor section fails to address underwater effects such as dredging, wakes, moorage or anchoring, and prop wash. It also contains the unexplained and unsubstantiated claim that there will be no wake-caused erosion "because individual site conditions would inhibit, reduce, and or minimize vessel wake energy." What are these conditions, and how do they inhibit, reduce or minimize?

Section 3.4.7.1
The main mitigation measure is to have an archaeological monitor for excavations deeper than 10 feet below modern ground surface. However, the AECOM report cites native sediment and possible stable soil horizons at 1-2 feet below surface, and even the DEIS states that native sediments begin at 5-10 feet. Monitoring itself is insufficient, since inadequate subsurface archaeological survey has occurred.

Chapter 4: Natural Environment
Definition of "INDIRECT IMPACT" on page 4.0-3 is lacking. Not only are indirect impacts considered those impacts that are "beyond the project area" as stated in the draft DEIS, but also those impacts that occur later in time, and beyond boundaries of site to include systems affected by project (U.S. Department of Transportation).

Chapter 8 Required Plans, Permits and Approvals
There is no mention at all of DNR approval in Table 8.1 for new or updated lease authorization under state approvals or permit list. There is no mention at all of DNR approval for new or updated lease authorization under state approvals or permit list Intro Materials FS-4. Reference to DNR approval necessary for dredging on state owned aquatic lands (both within and outside the lease area) should also be included.

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