

1 analysis surveys, Forest Inventory and Analysis surveys, and threatened, endangered, and
2 sensitive species inventories and monitoring on federal lands in Oregon, Washington,
3 California, and Idaho.

4 6. I was hired at BergerABAM (then the JD White Company, Inc.) in 2004 as
5 an ecologist. Since being hired in 2004 I have had the opportunity to prepare
6 environmental permitting and compliance documentation for a wide variety of projects
7 throughout the Pacific Northwest. This includes conducting resource inventories for
8 wetlands, fisheries, and wildlife resources, preparing permit applications and other
9 environmental compliance documents (National Environmental Policy Act/State
10 Environmental Policy Act documents, Biological Assessments (BA), etc.), and
11 coordinating with resource agencies. I have worked extensively on projects in and
12 adjacent to the Lower Columbia River.

13 7. As a biologist, I have conducted fish and wildlife habitat surveys, surveys
14 and monitoring for a wide variety of threatened/endangered/sensitive species, botanical
15 inventory and noxious weed surveys, and forest inventory and assessment surveys. I am
16 also certified as a Professional Wetland Scientist through the Society of Wetland
17 Scientists, and have experience conducting wetland delineations and wetland functional
18 assessments throughout the Pacific Northwest.

19 8. My experience also includes designing and implementing a variety of
20 mitigation and habitat restoration projects, from wetland creation and enhancement
21 projects, to riparian and in-stream habitat enhancements.

22 9. A copy of my Curriculum Vitae is attached hereto as Attachment A.

23 10. BergerABAM is a consulting firm with extensive expertise in planning,
24 civil and structural engineering, environmental resource impact analysis, and construction
25 management. BergerABAM was contracted to work as the project manager for the

1 Vancouver Energy Project. As part of the BergerABAM team working on this Project, I
2 worked with a team of engineers, planners, and biologists to evaluate the Project and its
3 potential impacts to natural resources, and to prepare environmental permitting and
4 compliance documentation as described in Section III below.

5 **II. PURPOSE OF TESTIMONY**

6 11. The purpose of my testimony is to provide testimony regarding: 1) the
7 Vancouver Energy Project's ASC compliance with WAC 463-60-322, WAC 463-60-332,
8 WAC 463-60-333, WAC 463-62-040, and WAC 463-62-050; and to address Adjudication
9 Issues, including the Environmental Impacts Issues (Issues 5, 6, 8, 17, 18), City of
10 Spokane Issues (23-24), and the Tribal Issues (Issues 38, 40-42, 56), as identified in the
11 Administrative Law Judge's Order Clarifying EFSEC's Process, Modifying Dispositive
12 Motion Deadline, Summarizing Preliminary Issues, and Setting Hearing Dates (February
13 3, 2016).

14 **III. SCOPE OF ANALYSIS OF THE TERMINAL'S IMPACTS**

15 12. I was engaged by Applicant Tesoro Savage Petroleum Terminal LLC, d/b/a
16 Vancouver Energy (hereinafter, TSPT or the Applicant) in the early stages of the
17 Vancouver Energy Project to prepare assessments of potential impacts of the Project to
18 habitat, vegetation, fish and wildlife, and wetland resources. Over the course of the
19 Project to date, I have prepared or participated in the preparation of the following
20 documents:

21 12.1 Original ASC

- 22 • Contributed to the Habitat, Vegetation, Fish, and Wildlife Section
23 (3.4) and Wetlands (3.5) sections of the Original ASC.
24 • Contributed to the Biological Resources Report Appendix.

25 12.2 Joint Aquatic Resources Permit Application (JARPA)

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- Prepared the original January 2014 JARPA for the Project.
- Prepared July 2015 JARPA update.

12.3 Biological Evaluation

- Prepared the original October 2014 Biological Evaluation (BE) for the Project;
- Prepared December 2014 BE Revision.
- Reviewed/coordinated August 2015 BE Revision.

12.4 Applicant-prepared Preliminary Draft Environmental Impact Statement (PDEIS)

- Prepared Fisheries Chapter of the Applicant prepared PDEIS.
- Assisted with Wetlands and Surface Waters Sections of Water Resources Chapter of the Applicant prepared PDEIS.

12.5 Applicant's Comment Letter on the Energy Facility Site Evaluation Council's (EFSEC) Draft Environmental Impact Statement (DEIS)

- Reviewed Aquatic Species Chapter of EFSEC's DEIS and prepared comments.
- Reviewed Wetlands and Surface Water subsections of Water Resources Chapter of EFSEC's DEIS and prepared comments.

13. My specific areas of analysis included the following: a) impacts to fisheries and aquatic resources (Original ASC, JARPA, PDEIS); b) impacts to wildlife resources (Original ASC, JARPA); c) impacts to ESA-listed species and critical habitats (JARPA, Biological Evaluation); d) impacts to surface waters (Original ASC, JARPA, PDEIS); and e) impacts to wetlands and waters of the US/State (JARPA, PDEIS).

14. My analysis was based on the Project as described in the Proposal Section (Volume I, Section 2) of the ASC.

15. I conducted a site visit to assess terrestrial site conditions on June 27, 2013. The purpose of this site visit was to evaluate and document habitat conditions and also to document the presence/absence of wetlands on terrestrial portions of the site. I was

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1 already quite familiar with the site and vicinity prior to this Project, based on previous
2 work conducted for the Port of Vancouver and Port tenants.

3 16. I referenced information from a number of industry-standard sources with
4 regards to identifying potential presence of wetlands and biological resources in the
5 Project vicinity. These included the following (a complete list of citations and reference
6 documents is provided in the ASC, the BE, and the PDEIS): a) species Lists from the US
7 Fish and Wildlife Service (USFWS); b) species Lists from National Marine Fisheries
8 Service (NMFS); c) Washington Natural Heritage Program (WNHP) data; d) Washington
9 Department of Fish and Wildlife (WDFW) Priority Habitats and Species data; e) WDFW
10 Salmonscape data; f) USFWS National Wetlands Inventory (NWI) data; and g) US
11 Department of Agriculture Natural Resources Conservation Service (USDA NRCS) soils
12 data.

13 **IV. ANALYSIS**

14 **A. Regulatory frameworks**

15 17. With regards to fisheries, wetlands, and surface water resources, the Project
16 has been evaluated for compliance with the following regulations.

17 **i. Federal regulations**

18 a. Endangered Species Act, 16 U.S.C. § 1531 et seq. (ESA)

19 18. Section 7 of the ESA requires federal agencies to ensure that their actions
20 are not likely to jeopardize the continued existence of endangered or threatened species or
21 result in the destruction or adverse modification of the critical habitat of such species.

22 Section 7 of the ESA requires that federal agencies consult with USFWS and NMFS when
23 actions may affect listed species or critical habitat. Concurrent with the EFSEC review of
24 this application, Vancouver Energy has been pursuing a Section 404 permit from the U.S.

25 Army Corps of Engineers (USACE). Pursuant to ESA Section 7, USACE with the Project

1 Proponent (as the non-federal representative) has been consulting with the USFWS and
2 NMFS regarding the proposed action's effect on ESA-listed species. BergerABAM
3 prepared, with my significant contribution, and Vancouver Energy initially submitted a
4 BE to the USACE in September 2014. BergerABAM's BE concluded that the proposed
5 action is not likely to adversely affect ESA listed species.

6 19. The USACE adopted the BE as its BA and submitted it to USFWS and
7 NMFS which analyzed the potential impacts of the Project on ESA-listed species. The
8 BA adopted the effects determinations for ESA-listed species and species proposed for
9 listings and for designated critical habitats.

10 20. Based upon this BA, in a letter dated March 16, 2016, USFWS concurred
11 with USACE's conclusion that the proposed action was not likely to adversely affect
12 ESA-listed species under its jurisdiction (attached hereto as Attachment B). NMFS is
13 currently developing a Biological Opinion that will analyze the impacts of the proposed
14 action on ESA-listed species under its jurisdiction.

15 b. Magnuson-Stevens Fisheries Conservation and Management
16 Act

17 21. The Magnuson-Stevens Fisheries Conservation and Management Act,
18 50 C.F.R. § 600 (Magnuson-Stevens Act), provides for the conservation and management
19 of fishery resources to prevent overfishing, rebuild overfished stocks, and facilitate the
20 long-term protection of essential fish habitats (EFH) to protect the viability of commercial
21 and recreational fisheries. The Magnuson-Stevens Act requires that federal agencies
22 consult with NMFS when actions have the potential to affect EFH.

23 22. The Columbia River includes habitats that have been designated as EFH
24 under the Magnuson-Stevens Act for various life-history stages of Chinook and coho
25 salmon (Pacific salmon EFH composite). The proposed in-water construction elements

1 require federal permits, triggering the need for compliance with the Magnuson-Stevens
2 Act. In conjunction with its ESA consultation with NMFS, USACE, as the federal lead
3 agency for the proposed Project, is consulting with NMFS regarding the potential effects
4 of the Vancouver Energy Terminal on EFH. The consultation is being conducted as part
5 of the ESA consultation process described above.

6 c. Rivers and Harbors Act of 1899

7 23. Compliance with Section 10 of the Rivers and Harbors Act (33 U.S.C.
8 § 401 et seq.; 33 C.F.R. § 322) is required when work occurs in, over, or within a
9 navigable waterway. USACE is responsible for administering this regulatory program.
10 The Columbia River is a navigable waterway, and proposed modifications of the existing
11 dock at Berths 13 and 14 would trigger the requirement for USACE review of Section 10
12 compliance. A JARPA was submitted to USACE for its review, along with supporting
13 reports and studies under this program.

14 d. Clean Water Act

15 24. The Clean Water Act, 933 USC § 1251 et seq. (CWA), regulates
16 discharges into waters of the United States through a number of different regulatory
17 provisions. The proposed Project's USACE individual federal Rivers and Harbors Act
18 Section 10 permit would require State of Washington CWA Section 401 Water Quality
19 Certification (WQC), administered by EFSEC with technical support from the
20 Washington Department of Ecology (Ecology). The USACE has also noted that a permit is
21 required under Section 404 of the CWA for discharge of concrete fill material into piles.

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ii. State regulations

a. Wetland protection

25. The Washington State Water Pollution Control Act, RCW 90.48, prohibits the discharge of waste into waters of the State. If a wetland is not subject to federal regulatory program, Ecology will use the provisions to require permits and mitigation for impacts to wetlands. No wetlands are located on the proposed Facility site; therefore, these State provisions do not apply.

b. Hydraulic project approval

26. Under the Hydraulic Code, RCW 77.55 and WAC 220-660, a Hydraulic Project Approval (HPA) is required for any construction activities that use, divert, obstruct, or change the natural flow or bed of any fresh water or saltwater of the state (e.g., the Columbia River). The primary purpose of the hydraulic code is to protect fish life. The hydraulic code has specific technical provisions for in-water work and approval of an HPA. The July 2015 JARPA has been supplemented with applicable reports and studies, to demonstrate that the Project complies with these permitting requirements.

iii. Local regulations

a. Wetland protection

27. The Vancouver Municipal Code, VMC 20.740.140, establishes standards for development or clearing activities within wetlands and associated wetland buffers. These standards require that Project activities result in no net loss of wetland or buffer functions. Base buffer widths are established based on wetland category, wetland characteristics, and land use intensity.

28. The Project would be sited on an existing industrial site and would not result in any impacts to wetlands or wetland buffers.

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b. Shoreline Master Program

29. If not reviewed through the EFSEC process, the Project would be subject to the City's Shoreline Master Program (SMP) under VMC 20.760. The Project site includes lands designated in the SMP as Aquatic, and activity within these areas would be subject to the policies and regulations of the SMP. These regulations include provisions for the protection of habitat used by fish species and generally require no net loss of shoreline ecological functions. The Project, as designed, is consistent with these regulations.

B. Baseline habitat assessment and species identification

30. BergerABAM assessed the baseline quality of the aquatic habitats at the Project site, within the vicinity of the Project site, and within the shipping corridor for the Project for the preparation of the ASC, JARPA, BE, and in the original PDEIS.

31. In general, the reach of the Columbia River that is within the Project site, vicinity, and shipping prism, provides aquatic habitat conditions suitable as a migratory corridor for several species of native and non-native fish species.

32. Aquatic habitat conditions are described in detail in the ASC (Section 3.4.3.1) and Appendices (Appendix H - Biological Resources Report), and within supplemental documentation including the JARPA, BE, and the Applicant-prepared PDEIS.

33. BergerABAM evaluated the anticipated aquatic species presence at the Project site, within the vicinity of the Project site, and within the shipping corridor for the Project. Information was based on a review of industry-standard databases and information sources (as described above). The Columbia River represents documented and/or potentially suitable habitat for several special status aquatic species, including

1 species listed or proposed for listing under the federal ESA, Washington state-listed
2 species, and species identified by WDFW as priority species and species of greatest
3 conservation need. A complete list of these species is provided in the Biological
4 Resources Report, which BergerABAM prepared and Vancouver Energy submitted as
5 Appendix H to the ASC.

6 **C. Potential impacts – construction**

7 34. BergerABAM assessed the potential impacts to aquatic species, and to
8 ESA-listed species associated with construction of the Project in the ASC, JARPA, BE,
9 and PDEIS. Direct impacts associated with construction fall primarily into the following
10 three categories.

11 **i. Temporary water quality impacts**

12 35. Increased levels of sedimentation and turbidity can result from any
13 sediment-disturbing activities. The proposed pile installation and removal activities
14 associated with the proposed dock modifications could disturb sediments and increase
15 turbidity temporarily within the action area. Increased levels of sedimentation and
16 turbidity could have temporary negative impacts on aquatic species. The proposed
17 overwater work creates the potential for construction debris to enter the waterway.
18 Equipment and storage containers associated with the proposed Project also create slight
19 potential for leaks and spills of fuel, hydraulic fluids, lubricants, and other chemicals. The
20 Project has incorporated impact minimization and best management practices, and through
21 their implementation is likely to avoid and further minimize any potential effects. A more
22 detailed analysis of this is presented in the ASC, JARPA, BE, and the PDEIS.

23 **ii. Temporary construction noise impacts**

24 36. Construction of the Project would result in both underwater and terrestrial
25 noise that could disturb or otherwise affect aquatic species. The proposed Project has the

1 potential to result in temporarily elevated terrestrial and underwater noise levels at the
2 Project site and within the Project vicinity during in-water pile installation and removal
3 activities, and during impact pile driving of upland piles. Vibratory pile installation and
4 removal may result in maximum underwater sound levels that meet or exceed NMFS's
5 established disturbance threshold (150 dB RMS), but would not be expected to result in
6 significant effects to any aquatic species. Underwater noise generated during upland pile
7 driving could potentially exceed the cumulative underwater noise injury thresholds for
8 fish greater than 2 grams (187 dB RMS) and for fish less than 2 grams (183 dB RMS). In
9 order to further minimize the potential for exposure of ESA-listed fish species to
10 cumulative underwater sound pressure levels that could result in injury, upland pile
11 driving would be restricted to the in-water work window. Additionally, given the nature
12 and quality of the habitat at the site, most fish are expected to be moving through the
13 action area, and they would not be expected to be exposed to the sound from all of the
14 impact strikes in a given day. For these reasons, it is unlikely that any ESA-listed fish
15 species would be exposed to cumulative underwater sound pressure levels above the
16 established injury threshold. A more detailed analysis of this is presented in the ASC,
17 JARPA, BE, and the PDEIS.

18 **iii. Direct (aquatic) habitat impacts**

19 37. The Project will result in minor changes to the configuration of the
20 overwater coverage at the site, which has the potential to affect habitat for aquatic species.
21 The extent and nature of these impacts have been minimized and avoided to the extent
22 possible through Project design modifications, as well as through the implementation of a
23 number of Best Management Practices (BMPs), as described in detail in the ASC,
24 JARPA, BE, and the PDEIS. The Project will not result in any net increase in permanent
25 impacts below the Ordinary High Water Mark (OHWM) of the Columbia River, and will

1 result in a net decrease in the amount of benthic habitat impacts and overwater shading.
2 Construction of the Project, therefore, is not expected to result in any measurable or
3 significant direct aquatic habitat impacts, or impact to aquatic species. A more detailed
4 analysis of this is presented in the ASC, JARPA, BE, and the PDEIS.

5 **D. Potential impacts – operations**

6 38. BergerABAM analyzed the potential for impacts to aquatic species
7 associated with the operation of the Terminal (with the exception of the spill analysis) in
8 the ASC, JARPA, BE, and PDEIS. The effects of potential spills associated with
9 operation were assessed by others. The primary vector for potential impacts to aquatic
10 species from operation of the facility a potential for impacts associated with stormwater
11 management at the site, which could affect water quality and quantity. The Project will
12 result in a slight reduction in the overall quantity of impervious surface at the site, as a
13 result of proposed landscaping, which will convert existing impervious surfaces to a
14 pervious state.

15 39. BergerABAM concluded that the proposed stormwater treatment will
16 provide treatment to a level that is consistent with existing treatment at the site, which will
17 ensure that aquatic species and habitats are not adversely affected by operational
18 stormwater. A more detailed analysis of this is presented in the ASC, JARPA, BE, and
19 the PDEIS. Stormwater management is also discussed in the testimony by
20 BergerABAM's project engineer Dan Shafar.

21 **E. Potential impacts – vessel transport**

22 40. BergerABAM analyzed the potential for impacts to aquatic species
23 associated with vessel transport (with the exception of the spill analysis and wake
24 stranding analysis, which were conducted by others) in the ASC, JARPA, BE, and PDEIS.

1 This section provides a summary of my findings, and more detailed analysis is presented
2 in the ASC, JARPA, BE, and the PDEIS.

3 **i. Exotic/invasive species introduction**

4 41. Vessels can potentially import exotic and/or invasive species on their hulls
5 and exterior equipment and/or in ballast water. Introduced species can often out-compete
6 native species and have the potential to alter natural habitats.

7 42. Vessels calling at the Terminal will be subject to the U.S. Environmental
8 Protection Agency's Vessel General Permit (VGP) issued under the National Pollutant
9 Discharge Elimination System (NPDES) for discharges incidental to operation of such
10 vessels, including ballast water discharges. The Washington State ballast water
11 requirements added to the VGP as Section 401 WQC conditions include the state
12 requirements codified in WAC 220-150, administered by WDFW. These requirements
13 include technology-driven treatment requirements and management practices so that
14 vessel discharges meet state water quality standards, WAC 173-201A.

15 43. Furthermore, ballast water discharges, would be of saltwater to freshwater
16 (because of the Section 401 WQC requirements to perform, at least, open sea ballast water
17 exchange), which has less propensity to introduce invasive species than if the exchange is
18 salt-to-salt or fresh-to-fresh water. Because of this, BergerABAM concluded that only
19 negligible impacts to aquatic species and habitats would be anticipated as a result of
20 ballast water discharge.

21 **ii. Bank erosion**

22 44. The risk of adverse effects to fish and fish habitat from increased bank
23 erosion is low. Streambanks at the site are well armored, and not particularly sensitive to
24 erosion, so these habitats likely will not be affected. Elsewhere in the Project vicinity and
25 shipping prism, there are unarmored banks, which could potentially be susceptible to

1 increased erosion from vessel wakes. Because shoreline erosion is a natural phenomenon
2 at susceptible locations and vessel wakes from existing shipping activity also occur, the
3 ESA-listed fish that use these habitats have typically adapted to the conditions that attend
4 the erosion, primarily temporary, localized turbidity. For these reasons, BergerABAM
5 determined that effects associated with bank erosion would be temporary and localized,
6 and would result in only minor negative impacts to fish and fish habitat.

7 **iii. Entrainment/impingement associated with vessel intakes**

8 45. It is possible for fish or other aquatic species to become entrained in or
9 impinged on vessel water intakes. Vessels that would serve the facility would have
10 intakes for engine cooling water and for ballast water intake. However, vessels serving
11 the facility are not likely to take on ballast water within the vessel corridor, making ballast
12 intake a highly unlikely risk of entrainment to fish or other aquatic species. Since Project
13 vessels could potentially be operating cooling water intakes within the vessel corridor, it is
14 possible that aquatic species could become entrained/impinged by these cooling water
15 intakes. The potential for entrainment/impingement to occur would likely be minimal and
16 similar to that associated with the existing baseline level of vessel traffic on the river. The
17 increased potential for entrainment would result in minor negative impacts to fish and
18 other aquatic species.

19 **iv. Vessel marine mammal and turtle disturbance and strike**

20 46. Vessel transport associated with the Project has the potential to result in
21 collisions of ships with species that include marine mammals and marine turtles.
22 Although marine turtles and cetaceans will not occur in the immediate vicinity of the
23 Project site or its vicinity, they could be affected in marine waters by vessels transiting
24 to/from the Columbia River. Marine turtles, pinnipeds, and cetaceans all may be at risk

1 for propeller or collision injuries, however the potential for such an event to occur is
2 relatively low.

3 47. In the DEIS, EFSEC provided analysis regarding vessel impacts to marine
4 mammals and turtles. EFSEC determined that collisions between pinnipeds and large
5 vessels are unlikely, as pinnipeds are typically vigilant and able to avoid collisions. While
6 pinnipeds could be disturbed by transiting vessels while at haulout sites, this disturbance
7 would not substantially disrupt normal behavior patterns of pinnipeds or their prey.
8 Therefore, potential impacts to pinnipeds from vessel disturbance and strike would be
9 negligible.

10 48. EFSEC also evaluated the potential for vessel strikes of cetaceans in the
11 marine portion of the vessel corridor. EFSEC conducted a review of the NMFS Large
12 Whale Ship Strike Database (Jensen and Silber 2004) and found no instances of ship-
13 struck whales in the vessel corridor study area between 1975 and 2002. The low
14 probability of a vessel strike combined with the small change in overall vessel traffic
15 calling at the proposed Terminal would result in a negligible impact to whales. Similarly
16 EFSEC's determination in the DEIS for marine turtles was that vessels would be moving
17 at low speeds and that marine turtles would be able to detect them and move out of their
18 path. Therefore, the potential for vessel strikes of marine turtles is determined to be
19 negligible.

20 **V. ASSESSMENT OF EFSEC'S DEIS ANALYSIS AND PROJECT'S**
21 **COMPLIANCE WITH CERTIFICATION STANDARDS**

22 49. BergerABAM reviewed and provided comment on portions of the Aquatic
23 Species (DEIS Chapter 3.6) and Water Resources (DEIS Chapter 3.3) chapters of
24 EFSEC's DEIS, as well as the portions of the Chapters on Potential Accidents (DEIS
25 Chapter 4) and Cumulative Impacts (DEIS Chapter 5) that relate to aquatic species,

1 surface waters and wetland resources. BergerABAM's comments were incorporated into
2 the Applicant's DEIS response letter. This portion of my testimony provides summarized
3 responses by BergerABAM to some of the issues raised in the DEIS, to demonstrate why
4 the Project application meets the requirements for Site Certification.

5 **A. Impacts to fish from vibratory pile driving**

6 50. The Section of the DEIS that addresses vibratory pile installation and
7 removal states that "effects to fish from underwater noise generated from pile driving
8 would be moderate." DEIS at 3.6-41. However, the effects analysis presented in this
9 Section of the DEIS does not support this conclusion, and instead confirms that the TSPT
10 plan for pile installation and associated mitigation meet the requirements for Site
11 Certification.

12 51. The analysis presented in the DEIS correctly states that:

13 Vibratory pile driving associated with insertion and removal of the
14 40 temporary support piles would lead to a temporary increase in
15 underwater noise levels in the proposed Project vicinity, which
16 could cause behavioral avoidance but is unlikely to cause injury.
17 All in-water pile driving would occur during an in-water work
18 window to minimize impacts to juvenile ESA-listed salmonids and
19 peak run timing of adult salmonids and eulachon spawning and
20 migration.

18 *Id.*

19 52. The potential for temporary behavioral disturbance during an in-water
20 work window timed to avoid peak presence would not rise to the threshold for moderate
21 impacts established in the DEIS, and should be considered a minor impact to aquatic
22 species. NMFS and USFWS have not established an underwater injury threshold for
23 ESA-listed fish species associated vibratory pile driving. Vibratory hammers generally
24 produce less underwater noise than impact hammers, and are considered to be a mitigation
25

1 measure to reduce the potential for adverse effects on fish that would otherwise be
2 associated with impact pile driving. In the context of ESA consultation, NMFS and
3 USFWS do not typically consider temporary effects associated with in water vibratory
4 pile installation to represent take of an ESA-listed fish species, and as a result do not
5 typically include this type of construction activity as part of the incidental take statement.
6 The BE prepared for this Project (BergerABAM 2014) documents that this activity “may
7 affect, but is not likely to adversely affect” any ESA-listed fish species. For these reasons,
8 impacts associated with vibratory pile driving and removal conducted during the approved
9 in-water work window would result in only minor impacts to aquatic species.

10 **B. In-water work window**

11 53. The Applicant has proposed to conduct work below the OHWM within the
12 USACE’s published in-water work window for the Columbia River mainstem between the
13 mouth of the river to the Snake River confluence (November 1 – February 28) (USACE
14 2015). This work window has been established by the USACE, in coordination with
15 resource agencies, for the protection of fish life, including ESA-listed species.

16 54. In Section 3.6.3.1 of the DEIS, EFSEC proposes a modified in-water work
17 window of September 1 – January 15 “to avoid peak migration and larval stages of
18 salmonid and non-salmonid species (especially eulachon and white sturgeon) in the
19 proposed Facility study area.” This “EFSEC-modified in-water work window” is also
20 included as a mitigation measure in Section 3.6.5 of the DEIS.

21 55. The USACE has reviewed the JARPA and BE for the Project, adopted the
22 BE as its BA, and submitted it to NMFS and USFWS for consultation under ESA Section
23 7. USFWS has issued a Letter of Concurrence (dated March 16, 2016), concurring with
24 the USACE’s determination that the project “may affect, but is not likely to adversely
25 affect” ESA-listed species and critical habitats (see Attachment B). NMFS is currently

1 developing a Biological Opinion that will analyze the impacts of the proposed action on
2 ESA-listed species under its jurisdiction.

3 56. In the absence of a consensus among the resource agencies regarding a
4 modified work window, EFSEC should defer to the USACE-published in-water work
5 window of November 1 – February 28, and the analysis in the Final Environmental Impact
6 Statement should be based upon this window.

7 **C. Construction impacts to marine mammals**

8 57. The Section of the DEIS that addresses vibratory pile installation and
9 removal correctly states that underwater noise associated with vibratory pile driving could
10 exceed the 120 dB RMS disturbance threshold established by the National Oceanic
11 Atmospheric Administration. The DEIS also correctly notes that the Project proposes to
12 implement a marine mammal monitoring plan during pile installation and removal
13 activities. The DEIS goes on to state that “impacts [to] marine mammal[s] are expected to
14 be minor to moderate.” DEIS at 3.6-44.

15 58. The “minor to moderate” impact determination does not take into account
16 the fact that the Applicant’s marine mammal monitoring plan (Appendix D-10 of the
17 DEIS) as described will avoid exposing any marine mammals to underwater noise above
18 the 120 dB RMS disturbance threshold. Since marine mammals will not be exposed to
19 levels of underwater sound that exceed the threshold, the impacts associated with
20 underwater noise would not rise to the threshold for moderate impacts established in the
21 EIS, and should be considered only a minor impact to marine mammals.

22 **D. Effects of vessel transport on benthic habitats**

23 59. The DEIS states that propeller scour from vessels and escort tugs could
24 result in impacts to benthic communities through disturbance of sediments on the river
25 bottom, and goes on to conclude that propeller scour could impact both the deeper water

1 areas in berth and vicinity and in adjacent shallow nearshore habitats, and could cause a
2 “localized minor but long term change in the benthic community.” DEIS at 3.6-50.
3 However, this assessment does not account for the dynamic nature of the Columbia River,
4 and the natural movement of sand and benthic material that occurs in the system, in which
5 sand waves are continuously forming and reforming, and benthic material is continuously
6 being moved through the system. In deep water portions of the Columbia River, including
7 the Federal Navigation Channel, regular currents, high flow events, and sediment bedload
8 transport all contribute to a highly dynamic deep water environment. In addition to effects
9 related to reduced light penetration in deep water, areas with dynamic bedload typically
10 express reduced biological productivity due to limited sediment stability and the
11 insufficient buildup of detritus and fine material. It also fails to account for the fact that
12 the berth already receives vessel traffic, and that benthic habitats in and adjacent to the
13 berth are already exposed to a baseline level of propeller scour. The potential for benthic
14 invertebrates to colonize areas exposed to strong currents is challenged by the risk of
15 burial due to accretion and the risk of scouring due to erosion in these dynamic habitats.
16 For example, *Corophium salmonis* (a benthic prey item for salmonids) occurs over a
17 variety of depths of substrate types throughout the vessel corridor of the Columbia River,
18 but densities of this amphipod species are negatively correlated with increasing depth and
19 positively correlated with increasing percent of silt. Together, these factors contribute to
20 reduced productivity in the deep water channel and berth areas of the vessel corridor. As
21 a result, any localized minor change in benthic disturbance would not be expected to result
22 in a long term change to the benthic community, since the benthic environment at the site
23 exists in a state of regular disturbance. In addition, vessel traffic in the navigation channel
24 and in the berth will disturb physically dynamic habitats that are continually disturbed by
25 natural currents. The impact of vessel traffic on these habitats should be negligible. For

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1 this reason, while propeller scour from vessels and tugs could result in a minor impact to
2 water quality, it would not represent a long term change to the benthic community.

3 **E. Vessel corridor wetland acreage**

4 60. The DEIS at page 3.3-38 states that 80 percent of the 143,731 acres
5 included in the vessel corridor is wetlands. This statement is misleading. In fact, most of
6 the area characterized as wetland is actually part of the deep water habitat of the Columbia
7 River mainstem. NWI maps are based on the classification system developed by USFWS
8 in the document titled Classification of Wetlands and Deepwater Habitats of the United
9 States (Cowardin et al. (1976)). The majority of the wetland acreage reported as
10 occurring within the vessel corridor is associated with the riverine, estuarine, and marine
11 systems of the Columbia River mainstem, which are classified as deepwater habitats and
12 have been appropriately described and discussed in the surface water section. Cowardin
13 et al. (1976) define the boundary between wetland and deepwater habitat in the marine
14 and estuarine systems as the elevation of the extreme low water of spring tide and
15 permanently flooded areas are considered deepwater habitats in these systems. The
16 boundary between wetland and deepwater habitat in the riverine systems lies at a depth of
17 2 meter (6.6 feet) below low water or if emergents, shrubs, or trees grow beyond this
18 depth at any time, their deepwater edge is the boundary (Cowardin et al. (1976)). The
19 mischaracterization of these deepwater areas as wetland overstates the wetland habitat
20 area dramatically and thus concludes a dramatic overestimation of potential wetland
21 impacts resulting from facility operations.

22 **F. Construction Impacts to Surface Water Quality**

23 61. The DEIS overstates the level of impact to surface water resources during
24 construction. In fact, construction of the facility would result in only minor impacts to
25 surface water quality. The analysis presented in Section 3.3.3.1 of the DEIS does not

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1 support a conclusion of moderate impacts. Impacts to water quality during construction
2 would be temporary in duration, and minimized through the implementation of BMPs as
3 described. This supports a determination by EFSEC this this Project will cause only
4 minor potential impacts to water quality as the impacts are low in intensity, temporary,
5 and local in extent.

6 **G. Compliance with certification standards**

7 62. The analysis that the BergerABAM team and I conducted for this Project,
8 documents consistency with the criteria for site certification that relate to water resources
9 (WAC 463-60-322), habitat, vegetation, fish, and wildlife (WAC 463-60-332), and
10 wetland resources (WAC 463-60-333); and with the construction and operation standards
11 for fish and wildlife resources (WAC 463-62-040), and wetlands (WAC 463-62-050). It is
12 my professional opinion that the Project satisfies the criteria in the above referenced
13 statues.

14 **VI. ATTACHMENTS**

15 63. I have attached the following Attachments to my testimony:

16 Attachment A: Curriculum Vitae

17 Attachment B: USFWS ESA Letter of Concurrence

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