EVALUATION REPORT AND FINDINGS

on the

Application for Certification
Pursuant to Section 401 of the
Federal Clean Water Act

Submitted by:

Department of the Army
U.S. Army Corps of Engineers

for the

DEEPENING OF THE COLUMBIA RIVER NAVIGATION CHANNEL

Pursuant to Oregon Administrative Rules
Chapter 340, Division 48

Prepared by:

Oregon Department of Environmental Quality
811 S. W. 6th Ave.
Portland, Oregon 97204

June 23, 2003

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INTRODUCTION

On September 4, 2002 the United States Army Corps of Engineers (Corps) applied for water quality certification, pursuant to Section 401 of the federal Water Pollution Control Act (Clean Water Act) from the State of Oregon for the deepening the Columbia River federal Navigation Channel. This application was supplemented with material dated November 26, 2002 and March 28, 2003.

This application follows Oregon Department of Environmental Quality's (DEQ's) consideration of the project in 1999. At that time DEQ denied water quality certification in a letter dated September 29, 2000.

This document represents DEQ's findings on this project relative to the applicable parts of the Clean Water Act and State Statute and Administrative Rules. These findings have been prepared pursuant to Section 401 of the Clean Water Act (33 U.S.C. §1431), Oregon Revised Statutes (ORS 468B) and Oregon Administrative Rules (OAR 340-48-025).

The record generated in the process of reviewing the application, all supplemental information submitted by the applicant, and all materials received as part of the public review process, are considered part of the record regarding this application.

REQUIREMENTS FOR CERTIFICATION

Section 401 of the federal Water Pollution Control Act [Clean Water Act (33 USC §1341)] establishes requirements for state certification of proposed projects or activities that may result in any discharge to navigable waters. Before a federal agency may issue a permit or license for any project that may result in any discharge to navigable waters, the state must certify that the proposed project or activity will comply with applicable effluent limitations, water quality-related effluent limitations, water quality standards and implementation plans, national standards of performance for new sources, and toxic and pretreatment effluent standards (Sections 301, 302, 303, 306, and 307 respectively, of the Clean Water Act) and any state regulations adopted to implement these sections. The state is further authorized to condition any granted certificate to require compliance with appropriate water quality- related requirements of state law.

The Clean Water Act (CWA) creates a unique system for protection of water quality. The state has primary responsibility and authority for protecting water quality. The federal law recognizes and supports state requirements as long as they are not less stringent than established federal minimums. Indeed, federally approved state requirements and standards become federal requirements and standards. The federal Environmental Protection Agency (USEPA) can intervene only if the state refuses to act or if state requirements do not meet federally prescribed minimums.

In the §401 certification process, the state acts as a federal agent under the authority of the federal law. However, the state must also comply with state law to the extent that federal law does not supersede it. In Oregon, statutory authority for §401 certification is contained in ORS Chapter 468 (B). The DEQ is the agency of the State of Oregon designated to carry out the certification

functions prescribed by Section 401 of the Clean Water Act. DEQ may issue an unconditional certification where a project will not impact water quality. A conditioned certification may be issued in those cases where a project may have an impact on water quality, but implementation of the conditions contained in the certification will assure compliance with standards. Certification may be denied in cases where a project cannot be undertaken in accordance with water quality standards.

Administrative rules (OAR Chapter 340 Division 48) prescribe the procedure DEQ is required to follow for §401 certifications. The rules identify the information that must be included in an application for §401 certification [OAR 340-48-020(2)]. Aside from general information about the project, the substantive information is that "required by the federal permitting or licensing agency or such other environmental background information as may be necessary to demonstrate that the proposed project or activity will comply with water quality requirements." DEQ may also request any additional information necessary to adequately evaluate the project impacts on water quality [OAR 340-48-020(3)].

Further administrative rules identify the type of information which is to be evaluated by DEQ in making §401 findings [OAR 340-48-020(8)]. The information may include, but need not be limited to:

(a) Existing and potential beneficial uses of surface and groundwater which could be affected by the proposed facility.
(b) Potential impact from the generation and disposal of waste chemicals or sludges at the proposed facility.
(c) Potential modification of surface water quality or water quantity as it affects water quality.
(d) Potential modification of groundwater quality.
(e) Potential impacts from the construction of intake or outfall structures.
(f) Potential impacts from waste water discharges.
(g) Potential impacts from construction activities.
(h) The project's compliance with plans applicable to Section 208 of the federal Clean Water Act (area wide waste treatment plans).

The application, together with information provided during the public input process is essential to support the following determinations to be made by DEQ pursuant to Section 401 of the Clean Water Act and state law:

a. Consistency with Sections 301, 302, 303, 306, and 307 of the Clean Water Act.

b. Consistency with rules adopted by the EQC for water quality, OAR Chapter 340 Division 41.

c. Identification of specific water quality-related requirements of state law which are appropriate to include as conditions in any granted certificate pursuant to Section 401(d) of the Clean Water Act, including ORS 468B.150 to 468B.185, the state Groundwater Protection Act.

d. Compliance with ORS 468B.040 and ORS 197.180(1)(land use planning).

A certification is required to contain the following elements pursuant to OAR 340-48-025:

(a) Name of applicant;
(b) Project's name and federal identification number (if any);
(c) Type of project activity;
(d) Name of water body;
(e) General location;
(f) Findings that the proposed project is consistent with:
    (A) Rules adopted by the EQC on Water Quality;
    (B) Provisions of Sections 301, 302, 303, 306 and 307 of the federal Water Pollution Control Act. Public Law 92-500, as amended;
(g) Such conditions as the DEQ Director determines necessary to require compliance with:
    (B) Standards of other state and local agencies that the Director determines are water quality related and are other appropriate requirements of state law according to Section 401 of the Federal Water Pollution Control Act, Public Law 92-500, as amended.
(h) A condition which requires the certificate holder to notify DEQ of all changes in the project proposal subsequent to certification.

The Director is also required prior to certification to provide an opportunity for public comment. Such a process may involve the holding of public hearings to obtain oral testimony.

SUMMARY OF APPLICATION

Documents Filed by the Applicant

The following documents are considered to be the application as filed by the applicant and have become part of the DEQ record:

1. US Army Corps of Engineers (1998) *Draft Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel*, Portland District, October

2. US Army Corps of Engineers (1998) *Appendices A-F: Draft Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel*, Portland District, October

Appendix A	Engineering Appendix
Appendix B	Columbia and Willamette River Sediment Quality
Appendix C	Economics
Appendix D	Real Estate Plan
Appendix E	HTRW Preliminary Assessment Screening
Appendix F	Salinity Intrusion Studies

3. US Army Corps of Engineers (1998) *Appendix G: Wildlife Mitigation: Draft Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel*, Portland District, October

4. US Army Corps of Engineers (1998) *Appendix H, Volume I: Columbia River Ocean Dredged Material Disposal Sites: Draft Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel*, Portland District, October

5. US Army Corps of Engineers (1998) *Appendix H, Volume II: Ocean Dredged Material Disposal Sites Coordination and Meeting Minutes: Draft Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel*, Portland District, October

6. US Army Corps of Engineers (1998) *Appendix H, Volume III: April, May 1999 Ocean Dredged Material Disposal Sites Coordination and Meeting Minutes: Draft Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel*, Portland District, October

4. US Army Corps of Engineers (1999) *Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River*

Federal Navigation Channel, Volume I: Main Report and Exhibits, Portland District, August

5. US Army Corps of Engineers (1999) *Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel, Volume II: Draft EIS Comments and Responses,* Portland District, August

6. US Army Corps of Engineers (1999) *Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel, Volume III: Attachments to Paul King Comment Letter,* Portland District, August

7. US Army Corps of Engineers (1999) *Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel, Appendices A-F: Technical Reports,* Portland District, August

Appendix A	Engineering Appendix
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Appendix F	Salinity Intrusion Studies

8. US Army Corps of Engineers (1999) *Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel, Appendix G: Wildlife Mitigation,* Portland District, August

9. US Army Corps of Engineers (1999) *Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel, Appendix H, Volume I: Ocean Dredged Material Disposal Sites Main Report and Technical Exhibits,* Portland District, August

10. US Army Corps of Engineers (1999) *Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel, Appendix H, Volume II: Ocean Dredged Material Disposal Sites Coordination and Meeting Minutes,* Portland District, August

11. US Army Corps of Engineers (1999) *Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel, Appendix H, Volume III: Ocean Dredged Material Disposal Sites Coordination and Meeting Minutes,* Portland District, August

12. US Army Corps of Engineers (1999) *Letter from Robert E. Willis, Chief, Environmental Resources Branch, USACOE to Russell Harding, Oregon DEQ*, October 14

13. US Army Corps of Engineers (1999) *Fax from Laura Hicks, USACOE to Russell Harding, Oregon DEQ*, December 10

14. US Army Corps of Engineers (2001) *Biological Assessment: Columbia River Channel Improvements Project*, December 28

15. US Army Corps of Engineers (2002) *National Marine Fisheries Service Formal Endangered Species Act Consultation on the Columbia River Channel Improvements Project*, with Technical Appendices, May 20

16. US Army Corps of Engineers (2002) *Columbia River Channel Improvement Project: Draft Supplemental Integrated Feasibility Report and Environmental Impact Statement*, July

17. US Army Corps of Engineers (2002) *Errata Sheet for Columbia River Channel Improvement Project: Draft Supplemental Integrated Feasibility Report and Environmental Impact Statement*, August 26

18. US Army Corps of Engineers (2002) *Letter from Davis Moriuchi to Russell Harding and Water Quality Certification Application*, September 4

19. US Army Corps of Engineers (2002) *Letter from Richard W. Hobernicht to Russell Harding and Water Quality Certification Application*, November 26

20. US Army Corps of Engineers (2002) *E-Mail and Attachments from Laura Hicks to Russell Harding*, November 26

21. US Army Corps of Engineers (2002) *Attachment A to Oregon 401 Certification for CRCD: CRCD Database* (Compact Disk)

22. US Army Corps of Engineers (2003) *Columbia River Channel Improvement Project: Final Supplemental Integrated Feasibility Report and Environmental Impact Statement*, Portland District, January

23. US Army Corps of Engineers (2003) *Columbia River Channel Improvement Project: Final Supplemental Integrated Feasibility Report and Environmental Impact Statement*, *Volume 2, Exhibits 1 of 2*, Portland District, January

24. US Army Corps of Engineers (2003) *Columbia River Channel Improvement Project: Final Supplemental Integrated Feasibility Report and Environmental Impact Statement*, *Volume 3, Exhibits 2 of 2*, Portland District, January

25. US Army Corps of Engineers (2003) *Columbia River Channel Improvement Project: Final Supplemental Integrated Feasibility Report and Environmental Impact Statement*, *Volume 4, Comment Letters on the Draft SEIS and Corps Responses*, Portland District, January

26. US Army Corps of Engineers (2003) *Columbia River Channel Improvement Project: Final Supplemental Integrated Feasibility Report and Environmental Impact Statement*, *Volume 5, Public Testimony*, Portland District, January

27. US Army Corps of Engineers (2003) *Errata Sheet for Columbia River Channel Improvement Project: Final Supplemental Integrated Feasibility Report and Environmental Impact Statement*, February 11

28. US Army Corps of Engineers (2003) *Letter from Davis G. Moriuchi to Michael T. Llewelyn*, April 28

29. US Army Corps of Engineers (2003) *Letter from Davis G. Moriuchi to Russell Harding*, March 28

Notification of Complete Application

DEQ reviewed the application and deemed that it was deficient in that specific land use findings, as required by OAR 340-048-0020(2)(i)(A)-(D). DEQ forwarded the application to affected land use jurisdictions (Clatsop, Columbia and Multnomah Counties) on September 27, 2002 and solicited from them formal findings relative to the project. A letter was received from Clatsop County dated November 20, 2002 in which the County chose not to make formal findings, but to draw the attention of DEQ to applicable provisions of the applicable Comprehensive Plan policies and Land and Water Development and Use ordinances. The County reserved the right to make more comprehensive comments in the public comment period, but did not do so.

DEQ advised the applicant of the deficiency by letter on September 27, 2002.

On December 2, 2002 the application was deemed complete.

Legal Name and Address of Project Owner (Applicant)

Department of the Army
Portland District
Corps of Engineers
P.O. Box 2946
Portland, OR 97208-2946

Legal Name and Address of Owner's Official Representatives

As above.

Description of Project Location

Proposed Action

The proposed action is to deepen the Columbia River portion of the Columbia and lower Willamette Rivers federal navigation channel from its current authorized 40- feet depth with advanced maintenance to 45-feet, to an authorized depth of 43-feet with advanced maintenance to 48- feet based on the recommendations in the Final *Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement*, dated August 1999, beginning at river mile three at the mouth of the Columbia River and proceeding generally eastwards to river mile 106.5 at the Interstate 5 bridge at Vancouver, WA. Actions to deepen the Willamette River portion of the federal navigation channel have been deferred until completion of Superfund cleanup efforts and will be subject to a separate 404(b)(1) evaluation and 401 certification.

Disposal

A number of dredged spoil disposal sites are proposed, as follows:

1. Potential wetland fills at two sites totaling 16.1 acres. Both sites are located in Washington: 10.7 acres at Mt. Solo (W-62.0) and 5.4 acres at Puget Island (W-44.0).

2. In-water (flowlane) disposal for the 43-foot channel alternative includes 3 million cubic yards (mcy) for construction and 24 mcy of maintenance material during the first 20 years. Flowlane disposal sites are in or adjacent to the Columbia River federal navigation channel in both Oregon and Washington at depths generally ranging from 50 to 65 feet. New flowlane disposal areas will be used at depths below 65 feet and above 35 feet at locations described in Section II(c) below.

3. Placement of material at 3 beach nourishment sites: Sand Island, Oregon, Skamokawa Beach, Washington, and Miller Sands Spit, Oregon. Sump locations at Columbia River Mile (CRM) 21 (Harrington Sump) and at CRM 18-20 (Tongue Point, Oregon) would also be used for placement of dredged material.

4. In-water placement of dredged material for restoration of intertidal emergent marsh habitat at Martin Island embayment, Washington.

5. In-water placement of dredged material for restoration of tidal marsh-intertidal flat habitat at Lois Island embayment, Oregon, and at Miller/Pillar between Pillar Rock and Miller Sands Islands, Oregon.

6. Two restoration measures (interim and long-term) are being considered at Tenasillahe Island, Oregon. The interim actions would be directed at improving connectivity and water exchange between sloughs/backwater channels interior to the levees at the Julia Butler Hansen National Wildlife Refuge and the Columbia River. The interim measure includes construction of two temporary cofferdams at existing tidegates to allow installation of improved outlet structures in a “dry” environment. These improved outlet structures would improve fisheries access and egress. Inlet improvements, channels, and water control structures would be constructed at three locations to direct Columbia River waters into the interior sloughs to improve fisheries access and improve water quality and circulation in the interior sloughs.

7. The long-term measure at Tenasillahe Island involves breaching the flood control levee surrounding Tenasillahe Island at five locations. These breach locations include the two existing tidegates and the three proposed inlet sites for the interim restoration measures. This action will improve conductivity of interior channels and restore tidal circulation to approximately 1,778 acres of estuarine habitat; a substantial gain in salmonid habitat is envisioned.

8. Tidegate retrofits for salmonid passage at Burris Creek in Woodland Bottoms, Washington.

9. The Shillapoo Lake, Washington, ecosystem restoration feature creates waterfowl and wildlife habitats on 470 to 839 acres. The concept for the restoration feature would be to create cells hydraulically separated by levees, but interconnected by water control channels and structures. This will require modifications to the outlet structure involving

excavation and/or fill and emplacement of a porous rock levee to block carp access to the wetland management cells comprising the project feature.

10. Development of managed wetland habitat at the Webb and Woodland Bottoms mitigation sites.

Waters of the State Impacted by Project

Direct impacts are as specified in the Description of Project Location section above. Impacts to surface waters can also be expected from disposal sites identified in the disposal section above.

Adjacent Landowners

The list of adjacent landowners known to DEQ in 1999 is as follows. In order to ensure that the following land owners and any new land owners of which DEQ was unaware were notified of the project, DEQ used the address list supplied on a compact disk by the US Army Corps of Engineers (see #23 above).

Owner Name	Owner Address
River Ranch, Homeowners Association	Route 2, Box 2341, Clatskanie, OR 97016
Dianne Kim, Dave Christensen	65640 Island Road, Deer Island, OR 97054
James W. Ericksen	12304 River Front Road, Clatskanie, OR 97016
Webb Drainage District	P.O. Box 866, Clatskanie, OR 97016
Scappoose Dairy, Loren Ellis Jr. & Sons	P.O. Box 1147, Scappoose, OR97056
Fay K. Fraser	P.O. Box 611, Clatskanie, OR 97016
Paul Godsil	P.O. Box 82249, Portland, OR 97282-049
St. Helens Yacht Club Mark Griffin	P.O. Box 714, St. Helens, OR 97051
Charles and Marie Haglund	Route 6, Box 598, Astoria, OR 97103
Lone Star Northwest, Doug Hale	1050 North River Street, Portland, OR 97227
Drams Inc., David J. Felgert	12454 Riverfront Road, Clatskanie, OR 97016
Scott R. Fraser	P.O. Box 611, Clatskanie, OR 97016
Vance R. Fraser	P.O. Box 1426, Beaverton, OR 97075
Morse Bros. Inc., Brian Gray	65060 Col. Riv. Highwy, Deer Island, OR 97054
Charles Haglund Jr.	Route 6, Box 596, Astoria, OR 97103
International Paper, Gene Harbeson	P.O. Box 854, Gardiner, OR 97441-0047
Etsel & Bernice Honeycutt	79944 Bodine Road, Clatskanie, OR 97016
Ben J. Hudson, Jr.	12632 River Front Road, Clatskanie, OR 97016
Howard Kern	65640 Island Road, Deer Island, OR 97054
K.C. Klosterman	32260 Old Highway 34, Tangent, OR 97389

Lillian Hudson	12632 River Front Road, Clatskanie, OR 97016
Columbia County Courthouse	St. Helens, OR 97051
Board of County Commissioners, Tony Hyde	
Donna Jensen	30803 SW Grahams Frry Rd., Wlsnvl, OR 97070
City of St. Helens, Mayor, Don Kalberg	P.O. Box 278, St. Helens, OR 97051
Zilpha & Mr. Pederson	33491 NW Reeder Road, Portland, OR 97231
George and Diane Lammi	14141 Midland Dist. Rd, Clatskanie, OR 97016
City of St. Helens City Administrator	P.O. Box 278, St. Helens, OR 97051
Marshland Drainage Improvement Co., Margaret Magruder	12589 Highway 30, Clatskanie, OR 97016
Ruben & Ilma Lehto	20787 Johns Dist. Road, Clatskanie, OR 97016
Arnold Leppin	68251 Col. Riv. Hghwy, Rainier, OR 97048
Lone Star Northwest, Eric Muller	P.O. Box 1225, Scappoose, OR 97056
Reichold Chemicals, John Oldham	P.O. Box 13582, RTP, NC 29709
Scapoose Sand and Gravel Scott Parker	P.O. Box AF, Scappoose, OR 97056
Martin Phillip	163 SW Freeman, Ste B, Hillsboro, OR 97123
George and Roberta Price	13800 Webb District Rd., Clatskanie, OR 97016
Jerome and Joan Parson	23000 NW Gillihan, Portland, OR 97231
Columbia County Courthouse, Jack Peterson	St. Helens, OR 97051
Larry D. Poor	13876 River Front Road, Clatskanie, OR 97016
OR DSL, Steve Purchase	774 Summer St., NE, Salem, OR 97310
ODFW, C. W. Rawlins	P.O. Box 59, Portland, OR 97208
Larson and Mason	P.O. Box 823, Rainier, OR 97048
Karsten & Edith Sjoli	20665 Johns Dist. Rd., Clatskanie, OR 97016
New Brix Maritime Co. M.A. Skiles	P.O. Box 83018, Portland, OR 97283-0018
Chris and Lyn Soter	14460 NW Oak Hills Drive, Beavertn, OR 97006
Martin and Linda Sunnes	163 SW Freeman, Ste. B, Hillsboro, OR 97123
Lone Star Northwest, Bob Short	050 North River Street, Portland, OR 97227
Dennis and Sandra Sisseck	35257 Sykes Road, St. helens, OR 97051
Louise A. Skaggs	20619 Johns Dist. Rd., Clatskanie, OR 97016
Svenson Island Landowner Becki Smith	Route 6, Box 598, Astoria, OR 97103
Patrick Sprague	17365 Clatskanie Dist. Rd., Cltskanie, OR 97016
Port or Portland Alan Willis	P.O. Box 3529, Portland, OR 97208
Port of St. Helens,	P.O. Box 598, St. Helens, OR 97051-0598

Peter Williamson
Columbia County Courthouse, St. Helens, OR 97051
Joel Yarbor

DESCRIPTION OF PROPOSED PROJECT

Proposed Action

The proposed action is to deepen the Columbia River portion of the Columbia and lower Willamette Rivers federal navigation channel from its current authorized 40- feet depth with advanced maintenance to 45-feet, to an authorized depth of 43-feet with advanced maintenance to 48- feet based on the recommendations in the Columbia River Channel Improvement Project: Final *Integrated Feasibility Report and Environmental Impact Statement*, dated January 2003, beginning at river mile three at the mouth of the Columbia River and proceeding generally eastwards to river mile 106.5 at the Interstate 5 bridge at Vancouver, WA. Actions to deepen the Willamette River portion of the federal navigation channel have been deferred until completion of Superfund cleanup efforts and will be subject to a separate 404(b)(1) evaluation and 401 certification. The proposed action also includes several ecosystem restoration sites.

The project includes the following actions:

1. Potential wetland fills at two sites totaling 16.1 acres. Both sites are located in Washington: 10.7 acres at Mt. Solo (W-62.0) and 5.4 acres at Puget Island (W-44.0).

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10. Development of managed wetland habitat at the Webb and Woodland Bottoms mitigation sites.

Tidegate retrofits associated with the above components of the project will be covered under existing Corps' Clean Water Act Section 404 permits.

With the use of the above disposal sites, the applicant projects that use of the deepwater ocean disposal site will not be necessary for initial deepening of the channel, and should not be necessary for the continuing maintenance of the channel.

General Description of Dredged or Fill Material

The material to be dredged and disposed as part of the Columbia River channel deepening and maintenance is predominately medium grain sand with some fine and coarse grain sand. The proposed 43-foot deepening alternative would result in flowlane disposal of an estimated 3 mcy during construction and an estimated 24 mcy over the first 20-years of maintenance. This maintenance quantity is estimated to be 20-30 mcy less than if current dredging and disposal practices were continued.

As described in Section 5.1.7 of the Final IFR/EIS, since the 1930s, the Corps has collected sediment data on the Columbia and Willamette Rivers. A comprehensive Sediment Quality Evaluation was prepared for the study (See Appendix B of the Final IFR/EIS). Since issuance of the Final IFR/EIS, the Corps has reviewed the analysis of thousands of collected samples from within and outside the channel. The likelihood of contaminants in the Columbia River portion of the federal navigation channel is low based upon all of the past testing and evaluation discussed

in the Final and Supplemental IFR/EIS. All material dredged will be evaluated under joint USEPA and Corps Dredged Material Evaluation Guidelines prior to disposal. The Sediment Quality Evaluation and compliance with USEPA/Corps Guidelines prior to dredging meet the evaluation and testing requirements of 40 CFR Part 230 Subpart G.

Ecosystem restoration activities at Tenasillahe Island, Shillapoo Lake, and the tidegate retrofit at Burris Creek will include the construction of cofferdams and levees. The fill material used for these activities will consist of clean sand and/or insitu material. A porous rock dam will also be constructed at Shillapoo Lake.

Mitigation at Webb and Woodland Bottoms will include construction of levees with insitu material.

Description of the Proposed Activities

Flowlane sites are in or adjacent to the Columbia River federal navigation channel at depths generally from 50 to 65 feet. However, there would be exceptions to the general depth criteria for the channel improvement project. The actual disposal sites cannot be designated beyond the general description in the first sentence of this section. They vary from year to year depending on the condition of the channel. Flowlane disposal could occur at depths of 35 to 65 feet between CRMs 64 and 68 and CRMs 90 and 101. Flowlane disposal could occur in areas over 65 feet deep in four specific areas: downstream of CRM 5; CRMs 29 to 40; CRMs 54 to 56.3 on the Oregon side of the channel; and CRMs 72.2 to 73.2 on the Washington side. The substrate at these locations is predominately medium grain sand with some fine and coarse grain sand.

The two wetland discharge sites total approximately 16.1 acres. Both sites are located in Washington [10.7 acres at Mt. Solo (W-62.0) and 5.4 acres at Puget Island (W-44.0)]. These sites lie behind flood control levees, and are drained and used for a variety of agricultural purposes.

Harrington Sump is a deepwater (~-40 foot Columbia River Datum (CRD)) site located between RM 20-22 in Oregon waters that historically and currently is used for placement of dredged material by hopper dredges. The sandy substrate at this location is comparable to the dredged material placed there. The sump is typically filled over a 2-3 year period, to approximately 35 foot CRD and then dredged to approximately 45 foot CRD with material disposed on Rice Island.

The temporary (two-year) sump to be used near Tongue Point (CRM 18-20), on the Oregon side, and immediately adjacent to the navigation channel, occurs in-water 38 to 60+ feet deep. The sandy substrate at this location is comparable to the dredged material to be placed there from the adjacent navigation channel.

The three sites selected for beach nourishment Sand Island, Oregon, Skamokawa Beach, Washington, and Miller Sands Spit, Oregon are non-vegetated erosive shoreline areas with sandy substrate.

The Lois Island embayment totals 357 acres, and was dredged as a mooring basin for decommissioned WWII ships. This restoration action would restore approximately 190 acres of the embayment to marsh habitat. The existing substrate averages about -18 feet CRD and consists of predominately medium grain sand with some fine and coarse grain sand. The Miller/Pillar restoration feature between Pillar Rock and Miller Sands Islands is approximately 230 acres. The existing substrate averages about -25 feet CRD and consists of predominately medium grain sand with some fine and coarse grain sand. Since the site is naturally erosive, a pile dike field would be constructed to stabilize the site and maintain bathymetry comparable to pre-erosion conditions. A stable bathymetry at historic depths is anticipated to improve benthic invertebrate productivity and fisheries resource use.

The Martin Island embayment is an approximately 34-acre area formed via excavation of material to provide fill for an adjacent portion of Interstate 5, and was subsequently used for log moorage and recreational boating, including moorage. The average depth of the embayment is approximately -20 feet CRD. Silt that settled in this quiet backwater and bark debris from log storage activities likely make up the bottom substrate.

The Tenasillahe Island (interim) sites affected by temporary cofferdam construction are silty to fine sand substrates at 2 to 4 foot depths. The inlet structures would principally entail construction through the flood control levee with minor construction activities in adjacent intertidal lands with a silt substrate. Long-term activities at Tenasillahe Island would include breeching the levees to restore full tidal circulation.

Tidegate retrofits proposed at the five primary locations would primarily entail construction work in levee material with a minor construction element potentially in the adjacent intertidal zone comprised primarily of silts.

Construction actions associated with the Shillapoo Lake ecosystem restoration feature would primarily occur inland to the main flood control levee on agricultural lands. Some construction work would occur in levee material with a minor construction element potentially in the adjacent intertidal zone comprised primarily of silts. Sediment discharge to adjacent waters would be minimal. Rock fill would occur in the existing discharge channel from the pump station to serve as a carp access barrier to the interior managed wetlands.

The Webb and Woodland Bottoms mitigation sites will be developed for wetland and riparian habitat by constructing low levees inside the main flood control dike and constructing gradual sloping banklines within the mitigation sites.

Upland Disposal Sites (Includes two Wetland Sites)

The process used for screening upland disposal sites is described in Section 4.4.3.4 of the Final IFR/EIS. Over 157 sites were reviewed. Multiple environmental and engineering criteria were applied to screen the sites and select those proposed for disposal of project dredged materials.

One of the environmental criteria applied was avoidance of wetlands to the extent practicable. As a result of the screening process, comments on the draft EIS, and subsequent adjustments in

disposal site boundaries, the total area of wetland fill was reduced from 30 acres for the plan evaluated in the draft EIS to 16.1 acres in the current recommended plan.

The two areas of wetland fill, 10.7 acres at Mt. Solo and 5.4 acres at Puget Island, are in river areas where the in-water disposal capacity is insufficient to handle the amount of material to be dredged. No other practicable means exists for disposing of dredged material without impacting a comparable or greater amount of wetland habitat. Other upland or in- water sites are not available in the vicinity or are already being used to capacity. The disposal sites containing wetland habitat lie behind flood control dikes, are actively drained and are used for agricultural purposes. These wetlands provide limited wildlife habitat value. The Puget Island and Mt. Solo disposal sites lie behind flood control dikes and are outside the Federal Emergency Management Agency 100-year floodplain.

In-water Disposal

Flowlane disposal is used in areas where no other disposal alternatives exist or where the quantity of material to be dredged is too small to warrant use of a pipeline dredges that would be necessary for upland disposal. Flowlane disposal is not expected to have a significant impact on aquatic resources. Benthic invertebrate productivity is generally low in the deeper channel areas and impacting these areas would not affect the overall productivity of the Columbia River.

Shoreline disposal locations were selected because of beneficial use that they provide. Sand Island protects a county/public park and riparian habitat. Skamokawa beach provides the resale of material and protects the public beach. Miller Sands protects an important aquatic habitat.

The Harrington Sump is necessary in the estuary in order to eventually place material upland on Rice Island. The Rice Island upland disposal site is located within the estuary adjacent to Harrington Sump. Material is temporarily placed in the sump when river conditions or equipment availability does not allow direct placement of material on Rice Island. Pipeline dredges later remove the material from Harrington Sump and place it upland for permanent disposal. The sump has been used for decades and is a disturbed area with low productivity.

Use of Harrington Sump reduces the need for flowlane disposal elsewhere in the estuary. The Tongue Point Sump is to be used during construction to temporarily store disposal material that will ultimately be placed on the Lois Island ecosystem restoration site by a pipeline dredge.

Two ecosystem restoration sites will be constructed utilizing dredge material in the estuary to help restore valuable habitat. The Lois Island embayment will be filled with material to an elevation approx 7 feet mean lower low water (MLLW) in order to develop tidal marsh habitat. This action would occur during the two-year construction period. The Miller Pillar ecosystem restoration feature will restore subtital and/or intertidal habitat in a naturally erosive area. Both of these restoration sites have been identified through the ESA consultation as beneficial to listed salmonid stocks.

The mitigation habitat development at the Martin Island embayment will also utilize dredged material to accomplish the habitat objective. Project mitigation, including mitigation for wetland

impacts such as the proposed creation of intertidal emergent marsh at Martin Island, was developed through an interagency team approach. The mitigation team included representatives from the Corps, Washington Departments of Ecology and Fish and Wildlife, US Fish and Wildlife Service (USFWS), and Oregon Department of Fish and Wildlife.

Other Restoration

The ecosystem restoration features described in the Final IFR/EIS that involve discharges of dredged or fill material into the waters of the U.S. include Tenasillahe Island and Shillapoo Lake. The purpose of these restoration features is to benefit listed ESA species, including salmonid ESUs and also to improve fish and wildlife habitat conditions. The Shillapoo Lake restoration feature and the Burris Creek tidegate retrofit feature were formulated as the result of a series of workshops with federal and state resource agencies. Tenasillahe Island restoration was a result of the ESA consultation process between the Corps, NOAA Fisheries and USFWS. The discharges that are a part of these features are necessary in order to realize the purpose of the features. There are no practicable alternatives to these discharges.

Other Wildlife Mitigation

The wildlife habitat mitigation described in the Final IFR/EIS that involve discharges into the waters of the U.S. includes Martin Island (Martin Island embayment was addressed in paragraph b above), Woodland Bottoms, and Webb mitigation sites. The purpose of these wildlife mitigation actions is to offset project-related wildlife habitat losses for riparian, wetland and agricultural lands. These mitigation actions were developed through an interagency process (WDFW, ODFW, USFWS, WDOE and Corps) utilizing the USFWS's Habitat Evaluation Procedures to assess project related losses and net gains in habitat units at potential mitigation sites. The selected mitigation sites produced the best net gain in habitat units at the least cost. The discharges that are a part of these mitigation actions are necessary in order to attain the wildlife habitat improvements. There are no practicable alternatives to these discharges.

SUMMARY OF APPLICANT'S DECRIPTION OF WATER QUALITY IMPACTS

Physical Substrate Determinations

Sediments in the mainstem Columbia River typically are composed of fine to course sand with less than one percent in the silt to clay size classification and less than one percent volatile solids. The dredging sites within the navigation channel, access channels, and all flowlane disposal sites and sumps are located within the mainstem of the Columbia River. Flowlane disposal sites are typically located near associated dredging sites and are subject to similar hydraulic forces. The riverbed generally consists of sand waves that have minimal compaction or consolidation. Therefore, the materials in the extraction sites and the substrate of the in-river discharge sites are similar in particle size, shape and compaction.

The disposal of dredged material would alter the depth and/or gradient of the flowlane disposal sites and sumps via raising the bottom elevation. As previously noted, the disposal location and depth of flowlane sites cannot be determined until shortly before the time of discharge due to the dynamic nature of the river bottom. However, rise in bottom elevation is expected to range from two to six feet depending on individual flowlane sites. This range of rise is not expected to cause significant changes in-water circulation, current pattern, water fluctuation and water temperature. The elevation rise in the disposal sites may affect the contours of the surrounding substrate; however, any such affect is expected to be insignificant. The physical characteristics of bottom sediments would not change significantly as the dredged material is essentially the same composition as material found at the discharge site.

The substrate of both disposal sites containing wetland habitat is primarily silty clay loam. Placement of dredged material at the sites would change the physical composition to primarily sand. The top one foot of topsoil would be removed at the Puget Island disposal site and stockpiled prior to deposition and then replaced on the surface as each of the three disposal cells at the location are filled. All wetland function and value will be lost at these locations.

The sandy substrate of the three-shoreline disposal sites is the same as the material that will be placed there. Disposal will raise the riverbed of shallow water areas along the beach. Some areas could change from shallow water to beaches. Disposal would erode away in three to four years. All of these sites have been used in the past to maintain the Columbia River. These sites tend to be non-vegetated erosive sites with low benthic productivity. There are no expected impacts to downstream habitat as a result of these sites.

The substrate of the two ecosystem restoration sites and one wildlife mitigation site utilizing dredged material for fill ranges from coarse sand to silt. Placement of dredged material at Miller/Pillar would raise the bottom elevations from six to 24 feet with predominately medium grain sand with some fine and coarse grain sand. For Lois Island embayment, the elevation increase would range from one to 32 feet and average about 24 feet. The bottom elevation of Martin Island embayment would rise approximately 20 feet to an intertidal level post-construction.

Implementation of the interim measure at Tenasillahe Island would result in a temporary modification to the physical substrate associated with placement of cofferdams established to allow construction in the dry. These structures would be removed once the outlets are modified. The improved outlets are not anticipated to modify the physical substrate at the outlets beyond existing condition. Some modification to the substrate will occur at the three inlet works to be established. These may include excavation of entrance and exit channels either mechanically or in combination with hydraulic forces associated with the initiation of flows at these locations.

The long-term restoration measure at Tenasillahe Island will entail breaching (excavation) the flood control levee at the two existing outlets and three proposed inlet locations associated with the interim measure. The restoration of tidal flows to the interior of Tenasillahe Island may result in the natural development of channels and/or modification to the existing drainage channels and substrate from the reintroduction of hydraulic forces. Disposal of excavated material from the breaches will be atop the remaining levee section to the extent practicable but deposition on interior lands that are currently pastures (drained wetlands) may occur, subject to further evaluations, for development of riparian forest habitat.

Tidegate retrofits at Burris Creek would have minimal impacts to the existing substrate. Typically, construction earthwork would be limited to the flood control levee if it proceeded beyond a simple replacement or modification of the tidegate at the end of the culvert. No change in the existing condition of the surrounding substrate due to changes in flow is anticipated with these modifications.

The Shillapoo Lake ecosystem restoration feature will entail construction of water control levees interior to the main flood control levee and modifications to the outlet works. The interior levees are per the Washington Department of Fish and Wildlife's management desires for the presently agricultural and Shillapoo Wildlife Management Area lands comprising the restoration feature. Structural modifications to the present outlet works will primarily encompass the flood control levee with minor disturbance to the outlet channel to Lake River. Another project feature entails placement of a porous rock fill (levee) across the outlet channel to block carp access to the interior managed wetlands. The substrate of the area is composed of silty clay loam. The levees will be constructed from these native soils.

The discharges at the Webb and Woodlands Bottoms mitigation sites will use clean sand and insitu materials, and will not adversely impact the existing substrate.

The cumulative impacts of other ongoing and currently authorized activities involving discharges of dredged or fill material that potentially affect physical substrate (*e.g*. existing filling and diking, ongoing maintenance dredging, maintenance of the mouth of the Columbia River, operation of the Federal Columbia River power system, and existing development along the Columbia River) are reflected in the current substrate conditions found at the sites discussed above. Future activities, including potential future upland development, are not anticipated to affect physical substrate except in the immediate vicinity of such projects. While future cleanup of the Willamette River under the federal superfund program could potentially affect substrate in a limited area downstream of the Willamette's confluence with the Columbia, the cleanup plan

has not been developed yet and therefore the potential effect of the cleanup cannot be predicted at this time.

Water Circulation, Fluctuation and Salinity Determinations

The proposed in-water disposal, including flowlane, two sumps, and shoreline disposal, would affect minor changes in hydrologic features such as circulation patterns, downstream flows, or normal water level fluctuations. Discharges at shoreline disposal sites are intended to offset shoreline erosion. However, the minor changes in hydraulic features are not expected to otherwise result in any significant impacts to aquatic communities, shoreline and substrate erosion and deposition rates, the deposition of suspended particulates, the rate and extent of dissolved and suspended components of the water body. Water quality characteristics such as water chemistry, clarity, color, odor, taste, dissolved gas levels, temperature, or nutrients would not be affected to any measurable degree. As discussed in Sections 6.2.2.2 and 6.2.2.3 of the Final and Supplemental IFR/EIS and Appendix F of the Final IFR/EIS, channel deepening and related disposal could cause a minor increase in salinity in the main channel in the lower part of the estuary. The hydraulic analysis of water surface elevations and salinity concentrations support the expectations of minor changes. Since the water surface profiles and thus the energy gradients are essentially unchanged, the flow in side channels and shallows would also be unchanged. The results of salinity intrusion modeling show insignificant changes in salinity concentrations outside the main channel. This result indicates that there would be very little hydraulic change away from the main channel. Based on the results of sediment analysis, and that dredged material would originate from nearby in-water locations, physical or chemical characteristics of the receiving water would not be adversely affected. Additional analysis of salinity and hydraulic effects, including potential minor changes in the location of the Estuarine Turbidity Maximum (ETM) associated with deepening (as opposed to disposal of dredged or fill material), is included in the Supplemental IFR/EIS.

The proposed restoration actions at Tenasillahe Island, and the tidegate retrofits at Burris Creek are intended to improve water circulation within these sloughs, backwaters and embayments. The creation of tidal marsh habitat within the Lois Island embayment is not anticipated to alter flow or water circulation patterns in the adjacent area. The placement of a pile dike field and subsequent fill between the pile dikes at Miller/Pillar to restore subtidal and or intertidal elevations would have a negligible impact to flows into lower Cathlamet Bay. The porous rock levee across the outlet/inlet for the Shillapoo Lake restoration effort is intended to maintain flow through the existing tidegate and pumping station at this location but preclude the passage of carp to the interior managed waters.

The creation of the intertidal habitat in the Martin Island embayment is in a protected area and is therefore not expected to alter circulation patterns adjacent to this site. The discharges at the Webb and Woodlands Bottoms mitigation will occur behind the main flood control dikes and will have no effect on water circulation, fluctuation and salinity.

The cumulative impacts of other ongoing and currently authorized activities involving discharges of dredged or fill material that potentially affects water circulation, fluctuation and salinity are reflected in the current conditions described in the Final and Supplemental IFR/EIS. Future activities, including potential future upland development, are not anticipated to affect water circulation, fluctuation or salinity except in the immediate vicinity of such projects. While future

cleanup of the Willamette River under the federal superfund program could potentially affect water circulation, fluctuation and salinity in a limited downstream area, the cleanup plan has not been developed yet and therefore the potential effect of the cleanup cannot be predicted.

Suspended Particulate/Turbidity Determination

Hopper dredges discharge through doors in the bottom of the hull while under power and traveling at slow speeds, generally around one or two knots. Hopper dredges typically discharge their load in less than a 20 minute period. A hopper dredge may make up to 15 disposal cycles per day. Loaded draft depths for hopper vessels vary with their capacity but will typically fall in the 15-30 foot depth range which is essentially the range for load discharge. The hopper dredges generates a turbidity plume that is limited in extent to the area below the discharge depth and immediately along the vessel path for the disposal duration. The discharged sand settles quickly to the river bottom. The sediment concentrations in the plume are limited because of the small amount of fines in the disposal material. River currents will carry the plume a short distance before it mixes with the river.

For pipeline dredges, dredged material is continuously pumped through a discharge diffuser that is located 20 feet below the water surface. The discharged sand settles rapidly to the bottom and a plume of fine grained sediments is carried away by the river currents. The downstream extent of the plume will depend on the river velocities and channel geometry at each discharge site.

Short-term minor increase in turbidity would occur in the mixing zones of Project in-water disposal sites and in-water work areas associated with mitigation and ecosystem restoration features. This condition would temporarily inhibit light penetration through the water column for a short period of time (hours) and would not significantly affect aquatic organisms. The dredging and disposal activity in the Project will involve the same type of sandy material, and will be performed with the same type of equipment and the same method of operations, as existing maintenance dredging of the 40-foot channel. Both states have previously issued state water quality certifications that have included approved mixing zones. With the issuance of state water quality certifications containing approved mixing zones and/or short-term modifications as appropriate, the expected increase in turbidity levels would not violate state water quality standards. Best management practices (BMP) would be utilized for the dredge and fill actions associated with the deepening and all in-water disposal, as well as the Lois Island embayment, Miller/Pillar ecosystem restoration features and Martin Island embayment development for wildlife mitigation. Best management practices would also be implemented for other ecosystem restoration features entailing work in-water, including construction of temporary cofferdams to contain and allow settling time for suspended sediments at Tenasillahe Island, and potentially for the Burris Creek tidegate retrofits.

All other discharges will occur in upland areas, except for two wetland areas in the State of Washington. These discharges are not expected to involve flowing or standing water where turbidity would be an issue.

The cumulative impacts of other ongoing and currently authorized activities involving discharges of dredged or fill material that potentially affect suspended particulates and turbidity are

reflected in the current conditions described in the Final and Supplemental IFR/EIS. Future activities, including potential future upland development, are not anticipated to affect suspended particulates or turbidity except in the immediate vicinity of such projects. While future cleanup of the Willamette River under the federal superfund program could potentially affect suspended particulates and turbidity in a limited downstream area, the cleanup plan has not been developed yet and therefore the potential effect of the cleanup cannot be predicted at this time.

Contaminant Determinations

With the exception of some discharge of materials associated with the mitigation sites and several of the ecosystem restoration features (Tenasillahe Island, Burris Creek tidegate retrofit, Shillapoo Lake), all of the material proposed to be discharged pursuant to this 404(b) evaluation is dredged material from the navigation channel and from existing access channels between the navigation channel and shoreside berths at three grain facilities, one gypsum plant and one container terminal. Actual deepening of these berths will require separate Section 404 permitting and review.

The discharges into the mitigation sites and several ecosystem restoration sites that do not involve material dredged from the navigation channel will be either insitu material or clean sand or rock from non-contaminated sources. Currently available information indicates no reason to suspect contaminants in the insitu material.

Sediments in the mainstem Columbia River typically are composed of sand with less than one percent in the silt to clay size classification and less than one percent volatile solids. The material present in the mainstem Columbia River meets exclusionary criteria as defined under the Marine Protection, Research, and Sanctuaries Act (MPRSA) and the CWA and, therefore, would not be subject to further testing under these two environmental laws. However, this material has been subjected to both physical and chemical testing as part of this project. The mainstem sediment has been determined, in accordance with the 1998 Dredged Material Evaluation Framework (DMEF), Lower Columbia River Management Area (USEPA/Corps 1998), to be suitable for unconfined in-water disposal by the USEPA, Corps, and the States of Oregon and Washington.

Sediment testing still will be required for material dredged from the turning basin at Astoria. The evaluation would be conducted by and coordinated with the appropriate agencies prior to any dredging and disposal action.

Material from the areas dredged in the Columbia River has been collected and analyzed since dredging first began in the early 1900s. Prior to the passage of the MPRSA and CWA physical analyses were conducted to determine dredging capability and to estimate production. After passage of these two environmental laws, analyses were expanded to include chemical and biological analyses as well as the traditional physical analyses. Physical analyses are also conducted as a regular parameter evaluated during benthic in fauna studies conducted in the river. Many of these in fauna studies have been conducted along the slopes and outside of the navigational channel during dredged material disposal site evaluation studies. The Corps has identified and is entering into a SEDQUAL database over 100 separate studies that have been

conducted on the Columbia River by the Corps since 1980. This includes sampling of over 3,100 stations for a total of over 4,100 samples.

While the nature of the mainstem material meets the exclusion from testing as provided in the regulations and evaluation guidelines, the Corps and USEPA decided to conduct confirmatory testing for the entire project. Sixty-seven separate shoal areas were identified for sampling through assessment of the of the 1994 navigation channel bathymetry. In June 1997, 89 surface grab samples were collected from the 67 shoals in the Columbia River project area (CRMs 3.0 to 106.2). In addition to physical analysis, 23 were further analyzed for chemical contaminants.

In accordance with the DMEF, chemical tests were performed including; inorganic total metals (9), polynuclear aromatic hydrocarbons (PAHs), total organic carbon (TOC), total volatile solids (TVS), acid volatile sulfide (AVS), pesticides and polychlorobiphenyls (PCBs), pore water tributyltin (TBT), and P450 reporter gene system (RGS), a dioxin/furan screen. Information regarding the sediment testing and results can be found in Appendix B of the Final IFR/EIS, *Columbia and Willamette River Sediment Quality Evaluation*. The dredged material was determined to be suitable for unconfined in-water disposal.

Additional evaluation of materials proposed for dredging was conducted as part of the ESA re-consultation and can be found in Appendix B of the Biological Assessment and in the Biological Assessment amendment letter (both found at Exhibit H of the Supplemental IFR/EIS). The additional evaluation confirmed the earlier conclusion that the primarily sandy dredged material does not contain unacceptable concentrations of contaminants and is suitable for unconfined in-water disposal. No additional testing is necessary.

The cumulative impacts of other ongoing and currently authorized activities involving discharges of dredged or fill material that potentially affect contaminants are reflected in the current conditions described in the Final and Supplemental IFR/EIS. Future activities, including potential future upland development, are not anticipated to affect contaminants except in the immediate vicinity of such projects. While future cleanup of the Willamette River under the federal superfund program could potentially affect contaminants in a limited downstream area, the cleanup plan has not been developed yet and therefore the potential effect of the cleanup can not be predicted at this time. Further, because the purpose of the cleanup is to effectively control contaminants and protect human health and the environment, it is likely that a major focus of cleanup design will be on avoiding and eliminating any off-site contaminant impacts.

Aquatic Ecosystem and Organism Determinations

Impacts to the aquatic ecosystem associated with discharge of dredged material will occur. Impacts associated with flowlane discharge of dredged material are expected to be minimal since the substrate of the main navigation channel consists primarily of sand naturally formed into sand waves by river currents. These sand waves are constantly eroding and reforming and do not provide the stable habitat needed for productive benthic communities. Sampling in the channel areas has confirmed their low productivity for benthic invertebrates. Additionally, those portions of the sand waves in the dredging prism are disturbed by annual dredging operations that typically occur from May through September for the navigation channel.

In-water disposal operations consist of flowlane disposal, use of two sumps and three shoreline disposal sites. Flowlane disposal is done in or adjacent to the channel margins typically at depths from 50-65 feet. These areas are generally similar to the channel areas and are not considered very productive for benthic communities. Static benthic communities would be covered and would not likely recover because of the continuous use of the sites. However, populations of these organisms are not considered to be very high because of the dynamic nature of the flowlane habitat.

Mobile organisms present in flowlane disposal areas, such as smelt, sturgeon and crab, are adapted to the dynamic nature of the habitat arising from continuous movement of sand via river currents. They are mobile organisms and generally should be physically capable of avoiding the disposal in most instances. Sturgeon live in the flow lane disposal sites as both adults and juveniles. The behavioral research by the USGS, funded by the Corps, will be used to manage the dredging and disposal operations to minimize impacts to sturgeon populations. Dungeness crabs are located primarily in the lower reaches of the estuary but can occur as far upriver as mile 18 when river flow is low and up river salinity is high. Crabs could be present in Harrington Sump as well as the flowlane site at RM 5. Studies have shown that crab are able to dig out of disposal materials, although some individual crab do not dig out and are smothered. The number of crabs impacted will depend upon how many are in the disposal site, which is dependent upon river and tide conditions. A study to develop a model of crab abundance versus salinity has been developed by Battelle NW Labs for the Portland District. This model will be used to schedule dredging and disposal to avoid periods of high crab abundance to the extent practicable in order to minimize impacts.

Studies have shown that smelt spawning is not successful in the high-energy areas like those used for flowlane disposal. Larval smelt move up into the water column after hatching, consequently, it is likely that smelt larvae would not be affected by aquatic disposal operations. Based on the above, it is likely that smelt populations would not be affected by flowlane disposal. The Corps has developed in-water work windows with the Oregon and Washington Fish and Wildlife agencies to avoid potential impacts to smelt.

Shoreline disposal sites are located in areas that are highly erosive and do not provide much, if any, habitat for benthic communities. Consequently, use of these sites is not expected to have a significant impact on the benthic productivity of the area. Through consultation with the NOAA Fisheries, only three shoreline disposal sites (Sand Island and Miller Sands Spit, Oregon and Skamokawa, Washington) are cleared for disposal operations.

Proposed wildlife mitigation actions would restore wetland functions of high value on approximately 210 acres over the three wildlife mitigation areas. Wetland habitat development would occur in the context of a larger, diverse, natural area, with a substantial riparian forest component, at each mitigation site. Riparian habitat restoration would restore approximately 228 acres of this habitat feature compared to the approximately 50 acres impacted by disposal. Fill activities associated with the Martin Island embayment mitigation site will convert the aquatic ecosystem at the site to intertidal emergent marsh.

Proposed ecosystem restoration features at Lois Island embayment and Miller/Pillar would restore approximately 590 acres of low to moderately productive subtidal habitat to highly productive shallow subtidal and tidal marsh habitat. Tidegate improvements at Burris Creek and inlet structures (interim action) at Tenasillahe Island would improve water quality and salmon habitat in several sloughs within the island complex. Implementation of the long-term feature at Tenasillahe Island, breaching the flood control dikes, would restore approximately 1,778 acres of habitat to tidal influence in the future. Depending on acquisitions, the Shillapoo restoration feature creates waterfowl and wildlife habitat on 470 to 839 acres.

The USFWS and the NOAA Fisheries have both determined that the proposed action, including ecosystem restoration features, is not likely to jeopardize the continued existence of threatened or endangered species under their purview. NOAA Fisheries believes that the most predictable impacts from the proposed action to ESA-listed salmonids and their habitats in the lower Columbia River, estuary, and river mouth are short-term, physical changes during the construction and subsequent maintenance period of the project. Expected impacts to key physical processes will be limited and short-term in nature during construction and maintenance. Further discussions of aquatic impacts are included in the Final IFR/EIS, Supplemental IFR/EIS and Biological Assessments prepared by Portland District for this action and in the biological opinions prepared by the USFWS and NOAA Fisheries.

The cumulative impacts of other ongoing and currently authorized activities involving discharges of dredged or fill material that potentially affect the aquatic ecosystem and organisms are reflected in the current conditions described in the Final and Supplemental IFR/EIS. Future activities, including potential future upland development, are not anticipated to affect the aquatic ecosystem and organisms except in the immediate vicinity of such projects. Further, any such projects that may affect the aquatic ecosystem and organisms are likely to require independent evaluation under the Endangered Species Act and NEPA. While future cleanup of the Willamette River under the federal superfund program could potentially affect the aquatic ecosystem and organisms in a limited downstream area, the cleanup plan has not been developed yet and therefore the potential effect of the cleanup cannot be predicted.

Proposed Disposal Site Determinations

In-water disposal, flowlane and sump disposal may be conducted by either hopper or pipeline dredges. The aerial extent of the mixing zone for in-water disposal is influenced by river conditions, material type, and dredge equipment. These factors are discussed in detail in the BA, SEIS, and the FEIS.

Flowlane disposal sites are located in or adjacent to the Columbia River federal navigation channel from CRM 3 to CRM 106, at depths generally from 50 to 65 feet. However, there would be exceptions to the general depth criteria for the channel improvement project. The actual disposal sites cannot be designated beyond the general description in the first sentence of this section. They vary from year to year depending on the condition of the channel. Flowlane disposal could occur at depths of 35 to 65 feet between CRMs 64 and 68 and CRMs 90 and 101. Flowlane disposal could occur in areas over 65 feet deep in four specific areas: downstream of CRM 5; CRMs 29 to 40; CRMs 54 to 56.3 on the Oregon side of the channel; and CRMs 72.2 to

73.2 on the Washington side. The sump sites are located near CRM's 18-20 and 20-22. River currents along the river are influenced by upstream discharges and ocean tides and typically vary from –1 fps to +3 fps. The Columbia River is generally not stratified except in the estuary where salinity intrusion causes stratification. The stratification is not expected to significantly influence mixing of the disposal plume.

The substrates at the flowlane and sump locations are predominately medium grain sand with some fine and coarse grain sand with less than one percent silt or clay. Columbia River suspended sediment concentrations vary seasonally, but are generally between 10-20 mg/l during the dredging season.

Hopper dredges discharge through doors in the bottom of the hull while under power and traveling at slow speeds, generally around one or two knots. Hopper dredges typically discharge their load in less than a 20 minute period. A hopper dredge may make up to 15 disposal cycles per day. Loaded draft depths for hopper vessels vary with their capacity but will typically fall in the 15-30 foot depth range which is essentially the range for load discharge. The hopper dredges generates a turbidity plume that is limited in extent to the area below the discharge depth and immediately along the vessel path for the disposal duration. The discharged sand settles quickly to the river bottom. The sediment concentrations in the plume are limited because of the small amount of fines in the disposal material. River currents will carry the plume a short distance before it mixes with the river.

For pipeline dredges, dredged material is continuously pumped through a discharge diffuser that is located 20 feet below the water surface. The discharged sand settles rapidly to the bottom and a plume of fine grained sediments is carried away by the river currents. The downstream extent of the plume will depend on the river velocities and channel geometry at each discharge site.

For flowlane and sump disposal the river current would carry away fine sediment but since the disposal material would be mostly sand which settles rapidly, the extent and duration of the plume would be minor. No mud flats and vegetated shallows would be affected by disposal in these areas as it occurs in and adjacent to the navigation channel which is generally distant from these habitat types. The material would not introduce toxic substances (see above discussion of contaminant determinations) into the surrounding waters.

Shoreline disposal can generate elevated suspended sediment concentrations near the shoreline at the three shoreline disposal sites. The suspended sediment concentrations decrease rapidly as the disposal water mixes with the river discharges.

The Lois Island and Miller-Pillar restoration sites will be filled by pipeline dredge. The disposal operation will be similar to a shoreline disposal. The suspended sediment plume will also be similar to that caused by shoreline disposal. The currents at the Lois Island site are generally lower than those in the main river channel and the plume will move away more slowly than at the shoreline disposal sites. The Miller-Pillar site will have reduced current velocities within the pile dike field, but the plume will rapidly mix with the river currents outside of the dike field.

The Martin Island mitigation site will be filled by pipeline dredge. The disposal operation will be similar to a shoreline disposal. The suspended sediment plume will also be similar to that caused by shoreline disposal. The currents at the Martin Island site are generally lower than those in the main river channel and the plume will move away more slowly than at the shoreline disposal sites.

Potential Effects on Human Use Characteristics.

Municipal and Private Water Supplies: There are no municipal or private water supply intakes in the vicinity of the disposal areas.

Recreational and Commercial Fisheries: Impacts to recreational and commercial fisheries will occur. Fill at Lois Island embayment will reduce by 19 percent the area available for recreational fishermen, principally for sturgeon, and commercial fisherman who utilize this area as part of the Select Area Fishery established in the lower Columbia River. The Miller/Pillar location would impact a portion of the Miller Sands gill net drift rendering it unsuitable for commercial fishing use. As indicated by the evaluation of contaminates above, the commercial and recreational fisheries are not anticipated to be impacted by contaminants. Disposal operations are not expected to disrupt migration and spawning areas. Dredging impacts to crab, including flowlane discharge of dredged material, are anticipated to impact a small fraction of the crab population in the estuary. The crab population in the estuary is only part of the total crab population in the area. Therefore, the project is not anticipated to adversely affect the crab fishery.

Water-related recreation: Water related recreation in the project area consist of: pleasure craft, jet skies, water skiing, wind surfing, canoeing, and kayaking. Impact to water related recreation is expected to be minor in areas where disposal will occur. Dredges will be operating in localized areas within the project area for short periods of time. Although there may be some disturbances to individual recreators, these disturbances will be minimal. Disposal within the Martin Island embayment to create emergent marsh habitat will prevent the recreational boaters' use of that area.

Aesthetics: No impacts to aesthetics are anticipated.

Parks, etc: There are two public beaches that are also shoreline disposal locations. While material is being disposed of at this location, there will be minor disturbances to shoreline use by individuals using the beach. The periodic placement of material at these locations enables continued public use of these areas. There are no national and historical monuments, national seashores, wilderness areas, and research sites within the discharge areas.

Determination of Cumulative Effects on the Aquatic Ecosystem

The proposed discharge of dredged material is not expected to have any significant adverse cumulative effects on the aquatic ecosystem.

The wetlands proposed for dredged material disposal do not contribute much value to the

aquatic ecosystem in their current state as they lie behind flood control dikes, are subject to drainage, and are impacted by current agricultural activities. Proposed enhancement and development of wetlands through implementation of the wildlife mitigation plan, and shallow water, riparian, slough and tidal marsh habitat improvements through restoration, would add cumulative resource value to the lower Columbia River ecosystem.

Other discharges of dredged material associated with the project are not predicted to have significant adverse effects either alone or in combination with other existing or reasonably predicted discharges of dredged or fill material. As discussed above, the cumulative effects of other ongoing and currently authorized activities involving discharges of dredged or fill material (e.g., existing filling and diking, ongoing maintenance dredging, maintenance of the mouth of the Columbia River, operation of the Federal Columbia River power system, and existing development along the Columbia River) are reflected in the current conditions described in the Final and Supplemental IFR/EIS.

While not caused by or connected to channel improvement, some future development of port, marine, and industrial facilities is reasonably foreseeable within the project area. Similarly, continued urban and industrial development in the project area is reasonably foreseeable in response to regional and national economic trends. Future urban, industrial and port development as it is implemented, would likely include some discharge of dredged or fill material which would in turn result in localized impacts to aquatic ecosystems (e.g., wetlands, riparian and shallow water habitat, and water quality).
The NOAA Fisheries and USFWS May 2002 Biological Opinions discuss such potential development and its potential impacts (e.g. increased localized demand for electricity, water and buildable land with indirect effects to water quality; and, the increased need for transportation, communication and other infrastructure;) on listed species, as well as state, local, tribal and private actions to benefit listed species.

Given the large geographic area involved and the uncertainties associated with state, local, tribal and private actions, the precise nature and timing of future development, and its environmental impact, are extremely difficult to predict. However, given the minimal adverse effects to aquatic ecosystems (if any) anticipated for the discharge of dredged materials associated with the entire Columbia River channel improvement project (including the ecosystem restoration features and mitigation measures), the discharges under the proposed project are not anticipated to contribute significantly to any adverse cumulative effects resulting from unrelated development projects. Further, all significant future development, including future discharge of dredged or fill material, will likely be subject to additional independent environmental reviews by state and federal agencies under the NEPA, CWA, ESA, and similar state programs.

Cleanup of the lower Willamette River under the federal Superfund program is also reasonably foreseeable and may directly affect the Columbia River and its aquatic ecosystem. At this time, the remedial investigation and feasibility study have not yet been completed and a cleanup plan has not been selected. Therefore, it is not possible at this time to determine the nature or magnitude of any short-term or long-term impacts of the cleanup action

on the aquatic ecosystem or whether such impacts would be cumulative to any impacts (positive or negative) of the channel improvement project.

Determination of Secondary Effects on the Aquatic Ecosystem

The proposed action would not result in fluctuating river levels. Surface runoff from disposal sites would be negligible as precipitation is expected to readily percolate into the sand. The rehandling (sale) of sand from upland disposal and shoreline disposal sites would not affect the aquatic ecosystem as the activity would occur behind containment dikes and/or above the high tide line. No other secondary effects resulting from the discharge of dredge material are anticipated.

Findings of Compliance (40 CFR § 230.12)

No significant adaptations of the guidelines were made regarding this evaluation.

Alternatives to the proposed action were considered, including the no-action alternative. Upland disposal of all Columbia River dredged material is not practicable from a physical or economic standpoint and would affect substantially more wetlands and wildlife habitat if it were implemented. All alternative disposal actions have been evaluated for engineering and environmental suitability using an array of screening criteria. Avoidance of wetlands, critical (ESA) riparian habitat and habitat important to threatened and endangered species are among the screening criteria considered in the analysis. Any remaining wetlands or riparian areas affected by disposal were considered unavoidable in achieving a practicable disposal plan. A wildlife mitigation plan addressing impacts to agricultural, wetland and riparian habitats has been developed in cooperation with federal and state resource agencies. Ecosystem restoration features were formulated as the result of a series of workshops with federal and state resource agencies and the public, and through the ESA reconsultation process between the Corps, NOAA Fisheries and USFWS, and was based on review of potential alternative actions that would benefit listed ESA species, including salmonid ESUs and Columbian white-tailed deer, and also improve fish and wildlife habitat conditions generally.

Water Quality Standards [40 CFR § 230.10(b)(1)]

The project complies with state water quality standards. The Corps has applied to the States of Oregon and Washington for water quality certifications under Section 401 of the Clean Water Act for all discharges of dredged material into waters of the United States associated with the project. Issuance of these certifications will reflect the states' reasonable assurance of compliance with state water quality standards.

Toxic Effluent Standards [40 CFR § 230.10(b)(2)]

The USEPA has designed 65 substances and compounds as toxic pollutants under section 307 (see 40 CFR § 401.15), but it has adopted effluent standards under this subsection only for manufacturers and formulators of aldrin, dieldrin, DDT, DDD, DDE, endrin, toxaphene, benzidene, and polychlorinated biphenyls (PCBs; see 40 CFR part 129). The disposal of dredged

material associated with this project would not violate toxic effluent standards of Section 307 of the CWA.

ISSUANCE OF PUBLIC NOTICE

Public notice of the Corps' application was released on December 2, 2002. A second, subsequent public notice was issued on April 29, 2003.

Public Hearings

Three public hearings were held on the application, as follows:

Columbia River Maritime Museum
1792 Marine Drive
Astoria, OR 97103

Date: January 6, 2003
Time: 7:30 p.m.

State Office Building
800 NE Oregon Street
Portland, OR 97232

Date: January 7, 2003
Time: 8:00 p.m.

Columbia River Maritime Museum
1792 Marine Drive
Astoria, OR 97103

Date: May 29, 2003
Time: 7:00 p.m.

All three hearings were preceded by a brief informational/question and answer session.

Written Comments

The deadline for acceptance of public written comments was set at 5:00 p.m. on January 15, 2003. Representations were made to extend the public comment period. These requests were based on the fact that the Corps had not released its Final Supplemental EIS, and that the public wanted to be able to view this. DEQ considered this argument but decided not to extend the public comment period, as the project under consideration for this certification is the one contained in the application before DEQ, not the one contained in the Final Supplemental EIS.

DEQ subsequently received a letter from the Corps dated March 28, 2003. In this letter, the Corps requested that DEQ consider additional information in the form of the Final Supplemental Integrated Feasibility Report and Environmental Impact Statement. Because this material arrived after the close of the public comment period, DEQ issued a second public notice extending the previous comment period and opening a new comment period during which the public could provide comments to DEQ on the new material. DEQ decided to extend the comment period from the close of the earlier comment period to enable it to accept late comments that had been received after the close of the previous period.

The second public comment period extended until 5:00 p.m. on June 2, 2003.

APPLICABLE WATER QUALITY REGULATIONS AND DEQ EVALUATIONS

Oregon's water quality regulations are contained in Oregon Administrative Rules (OAR) Chapter 340, Divisions 40 through 53. Division 40 contains the state's groundwater standards. Division 41 entitled "State-Wide Water Quality Management Plan: Beneficial Uses, Policies, Standards, and Treatment Criteria for Oregon" contains the surface water standards, and is the most significant with respect to §401 certification of a proposed project. The requirements and standards set forth in Division 41 were adopted to comply with the surface water quality protection provisions of both state and federal law. The water quality standards in Division 41 are composed of three elements: beneficial uses, water quality criteria, and the antidegradation policy.

Beneficial Uses

Both Oregon Law and the federal Clean Water Act are structured to require that water quality be protected and maintained so that existing and potential beneficial uses of public waters are not impaired or precluded by degraded water quality. The regulatory approach used is to:

1. identify beneficial uses that are recognized as significant with regard to water quality protection;
2. develop and adopt standards of quality for significant water quality parameters to define the quality that is necessary to protect the identified beneficial uses;
3. establish and enforce case-by-case discharge limitations for each source that is permitted to discharge treated wastes into public waters to assure that water quality standards are not violated and beneficial uses are not impaired; and
4. establish and implement "best management practices" for a variety of "land management" activities to minimize their contribution to water quality standards violations or impairment of beneficial uses.

The beneficial uses of surface water for the Columbia River in the reaches subject to the proposed project are contained in Tables 1 (North Coast – Lower Columbia Basin, OAR 340-41-202); and Table 6 (Willamette Basin, OAR 340-41-442). The listed beneficial uses are shown in Table 1.

Table 1: Beneficial Uses for the Columbia River

Use	Mouth-R.M. 86	R.M. 86-120
Public Domestic Water Supply	X	X
Private Domestic Water Supply	X	X
Industrial Water Supply	X	X
Irrigation	X	X
Livestock Watering	X	X
Anadromous Fish Passage	X	X
Salmonid Fish Rearing	X	X
Salmonid Fish Spawning	X	X
Resident Fish and Aquatic Life	X	X
Wildlife and Hunting	X	X
Fishing	X	X
Boating	X	X
Water Contact Recreation	X	X
Aesthetic Quality	X	X
Hydro Power		X
Commercial Navigation & Transportation	X	X

Water Quality Standards

Water quality standards are developed for varying geographic areas to protect beneficial uses. Generally, if a water quality standard fully protects the most sensitive beneficial use, then all beneficial uses are fully protected. Water quality standards have been adopted for water quality parameters that are most significant or useful in regulating pollution. These standards take the form of both numeric limits and narrative criteria and have been established based on best available information at the time they were adopted. Development of standards is a continuing process. As new information becomes available, standards for additional parameters may be added and existing numeric standards or narrative criteria may be revised to better reflect the intent of protection of the identified beneficial uses.

Antidegradation Policy

Oregon's antidegradation policy (OAR 340-41-026) applies to all surface waters. In the case of bodies of water that meet water quality standards, it provides for the maintenance of existing water quality. Specifically, it states that the existing quality of high quality waters (i.e., waters meeting water quality standards) shall be maintained and protected unless the Environmental Quality Commission makes certain rigorous findings of need. For water quality-limited waters, water quality may in no circumstances be lowered; that is, these waters have a nondegradation status.

POTENTIAL MODIFICATION OF SURFACE WATER QUALITY

Biological Criteria

340-41-027 Waters of the State shall be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities.

340-41-006 defines "without changes in the resident biological community" as "no loss of ecological integrity when compared to natural conditions at an appropriate reference site or region." "Biological criteria" are defined as "numerical values or narrative expressions that describe the biological integrity of aquatic communities inhabiting waters of a given designated aquatic life use." "Ecological integrity" is defined as "the summation of chemical, physical and biological integrity capable of supporting and maintaining a balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of the natural habitat for the region." An "appropriate reference site or region" is further defined as "a site on the same water body, or within the same basin or ecoregion that has similar habitat conditions, and represents the water quality and biological community attainable within the area of concern."

Application of Standard: The biological criteria standard is meant to complement the other parameter-specific criteria in the following manner. The parameter-specific criteria are designed to give full protection to the most sensitive beneficial use, with the implicit assumption that if the most sensitive beneficial use is protected, then all uses will be protected. However, the application of these criteria is very limited in considering multiple stressors and cumulative effects. By contrast, the biological criteria are aimed at gaining the ability to assess total impact to the community in situ. Biological criteria make it possible to evaluate the impact of a source without a need for measuring every possible water quality variable. Thus, the standard is applied as a measure of the impact of a source by comparing the biological integrity (as represented by appropriate expressions) downstream of the source with that at a reference site or region.

Present Condition: There are several salmonid species listed under federal and state endangered species statutes that inhabit the Columbia River. While the factors that have led to their decline are manifold, water quality has played a role. A number of NOAA Fisheries and US Fish and Wildlife Service Biological Opinions cover these species.

Sturgeon is present in areas proposed for dredging and disposal. Presence seems to be greater in summer, lower in winter and at some intermediate level in the spring.

Eulachon (smelt) densities vary by season, but seem to be at their greatest abundance in the spring.

Dungeness crab are present in the river up to river mile 18.

Applicant's Position: Impacts to the aquatic ecosystem associated with discharge of dredged material will occur. Impacts associated with flowlane discharge of dredged material are expected to be minimal since the substrate of the main navigation channel consists primarily of

sand naturally formed into sand waves by river currents. These sand waves are constantly eroding and reforming and do not provide the stable habitat needed for productive benthic communities. Sampling in the channel areas has confirmed their low productivity for benthic invertebrates. Additionally, those portions of the sand waves in the dredging prism are disturbed by annual dredging operations that typically occur from May through September for the navigation channel.

In-water disposal operations consist of flowlane disposal, use of two sumps and three shoreline disposal sites. Flowlane disposal is done in or adjacent to the channel margins typically at depths from 50-65 feet. These areas are generally similar to the channel areas and are not considered very productive for benthic communities. Static benthic communities would be covered and would not likely recover because of the continuous use of the sites. However, populations of these organisms are not considered to be very high because of the dynamic nature of the flowlane habitat.

Mobile organisms present in flowlane disposal areas, such as smelt, sturgeon and crab, are adapted to the dynamic nature of the habitat arising from continuous movement of sand via river currents. They are mobile organisms and generally should be physically capable of avoiding the disposal in most instances. Sturgeon live in the flow lane disposal sites as both adults and juveniles. The behavioral research by the USGS, funded by the Corps, will be used to manage the dredging and disposal operations to minimize impacts to sturgeon populations. Dungeness crabs are located primarily in the lower reaches of the estuary but can occur as far upriver as mile 18 when river flow is low and up river salinity is high. Crabs could be present at the flowlane disposal site at river mile five. Studies have shown that crabs are able to dig out of disposal materials, although some individual crab do not dig out and are smothered. The number of crabs impacted will depend upon how many are in the disposal site, which is dependent upon river and tide conditions. A study to develop a model of crab abundance versus salinity is being developed by Battelle NW Labs for the Portland District. This model will be used to schedule dredging and disposal to avoid periods of high crab abundance to the extent practicable in order to minimize impacts. The applicant estimates incremental impacts to Dungeness crab from initial deepening from 3,000 to 26,000 harvestable crabs, and an impact of between 4,000 to 9,000 harvestable crabs during annual maintenance. This compares with an annual harvest of 5.3 million crabs.

Studies have shown that smelt spawning is not successful in the high-energy areas like those used for flowlane disposal. Larval smelt move up into the water column after hatching, consequently, it is likely that smelt larvae would not be affected by aquatic disposal operations. Based on the above, it is likely that smelt populations would not be affected by flowlane disposal.

Shoreline disposal sites are located in areas that are highly erosive and do not provide much, if any, habitat for benthic communities. Consequently, use of these sites is not expected to have a significant impact on the benthic productivity of the area. Through consultation with the NOAA Fisheries, only three shoreline disposal sites (Sand Island and Miller Sands Spit, Oregon and Skamokawa, Washington) are cleared for disposal operations.

Proposed wildlife mitigation actions would restore wetland functions of high value on approximately 194 acres over the three wildlife mitigation areas. Wetland habitat development would occur in the context of a larger, diverse, natural area, with a substantial riparian forest component, at each mitigation site. Riparian habitat restoration would restore approximately 202 acres of this habitat feature compared to the approximately 50 acres impacted by disposal. Fill activities associated with the Martin Island embayment mitigation site will convert the aquatic ecosystem at the site to intertidal emergent marsh.

Proposed ecosystem restoration features at Lois Island embayment and Miller/Pillar would restore approximately 590 acres of low to moderately productive subtidal habitat to highly productive shallow subtidal and tidal marsh habitat. Tidegate improvements at Burris Creek and inlet structures (interim action) at Tenasillahe Island would improve water quality and salmon habitat in several sloughs within the island complex. Implementation of the long-term feature at Tenasillahe Island, breaching the flood control dikes, would restore approximately 1,778 acres of habitat to tidal influence in the future. Depending on acquisitions, the Shillapoo restoration feature creates waterfowl and wildlife habitat on 470 to 839 acres.

The USFWS and the NOAA Fisheries have both determined that the proposed action, including ecosystem restoration features, is not likely to jeopardize the continued existence of threatened or endangered species under their purview. NOAA Fisheries believes that the most predictable impacts from the proposed action to ESA-listed salmonids and their habitats in the lower Columbia River, estuary, and river mouth are short-term, physical changes during the construction and subsequent maintenance period of the project. Expected impacts to key physical processes will be limited and short-term in nature during construction and maintenance. Further discussions of aquatic impacts are included in the Final IFR/EIS, Supplemental IFR/EIS and Biological Assessments prepared by Portland District for this action and in the biological opinions prepared by the USFWS and NOAA Fisheries.

The cumulative impacts of other ongoing and currently authorized activities involving discharges of dredged or fill material that potentially affect the aquatic ecosystem and organisms are reflected in the current conditions described in the Final and Supplemental IFR/EIS. Future activities, including potential future upland development, are not anticipated to affect the aquatic ecosystem and organisms except in the immediate vicinity of such projects. Further, any such projects that may affect the aquatic ecosystem and organisms are likely to require independent evaluation under the Endangered Species Act and NEPA. While future cleanup of the Willamette River under the federal superfund program could potentially affect the aquatic ecosystem and organisms in a limited downstream area, the cleanup plan has not been developed yet and therefore the potential effect of the cleanup cannot be predicted.

Public Testimony: Sturgeon will be entrained during dredging and will be smothered during disposal. Their prey will be destroyed. Filling of areas greater than 65 feet deep will adversely impact sturgeon habitat

Impacts to Eulachon (smelt) are not well understood. No in-water disposal should take place during the peak eulachon outmigration downstream from spawning areas.

There are no in-water work windows proposed to protect beneficial uses.

No dredging of channel side slopes should occur while salmon are migrating.

The project will result in discharges that will result in habitat degradation

DEQ Evaluation: Issuance of a biological opinion by NOAA Fisheries has evaluated the project for its impacts on species listed under the Endangered Species Act. That biological opinion contains provisions which, if implemented will be protective of the listed species.

Species other than those listed inhabit the lower Columbia River. These include sturgeon, lamprey, smelt (eulachon) and crabs. Studies have shown minimal entrainment of sturgeon during dredging. Smelt are more susceptible, though little data exists on entrainment rates. Pacific lamprey is another species upon which little data exists on entrainment rates.

Other than dredging, the other major impact occurs with sediment disposal. Again, NOAA Fisheries has evaluated this relative to species listed under the Endangered Species Act. Disposal of sediments in depths between 35 and 65 feet is not expected to have a significant impact on aquatic resources. Benthic communities will not have their over all productivity affected, as it is already generally low in the deeper channel areas. During disposal, only a few inches of sediment will deposit on the bottom. Most fish will avoid and/or recover from this.

Disposal in areas of greater than 65 feet of depth may impact white sturgeon. As with the shallower water disposal, only a few inches of sediment will deposit on the bottom, and sturgeon can easily avoid this. There may be some young-of-year juvenile sturgeon which will be unable to avoid this. Habitat will still be usable by sturgeon after disposal.

Flowlane disposal impacts on lampreys are unknown, since their distribution in the lower river is not well documented. If they are near the bottom, they can likely avoid sediment disposal.

The likelihood of invasive species introductions from ballast water, and organisms adhering to vessels is not greater than at present as a result of this project. There are likely to be fewer, but larger vessels transiting the navigation channel, which may reduce the risk of introductions.

DEQ Finding: In order to protect migrating juvenile salmonid smolts in-water work windows should be adhered to. Because juveniles migrate high in the water column, or at the edges of the river, in-water work period are not as critical within the existing navigation channel itself. However, for those areas outside the channel, the agreed fishery in-water work windows should be followed.

Disposal of dredged spoils in deeper areas of the river may destroy sturgeon habitat. Disposal in areas of the river of greater than 65 feet in depth should not be undertaken.

Flowlane disposal of sediments below eulachon (smelt) spawning areas in the peak of the migration season should not be undertaken.

Nuisance Phytoplankton Growth

340-41-150 The following values and implementation program shall be applied to lakes, reservoirs, estuaries and streams, except for ponds and reservoir less than 10 acres in surface area, marshes and saline lakes:

(1) The following average Chlorophyll a values shall be used to identify waterbodies where phytoplankton may impair the recognized beneficial uses:

(a) Natural lakes which thermally stratify: 10 µg/l

(b) Natural lakes which do not thermally stratify, reservoirs, rivers and estuaries: 15 µg/L

(2) Average Chlorophyll a values shall be based on the following methodology (or other methods approved by DEQ): a minimum of three (3) samples collected over any three consecutive months at a minimum of one representative location (e.g., above the deepest point of a lake or reservoir or at a point mid-flow of a river) from samples integrated from the surface to a depth equal to twice the secchi depth or the bottom (the lesser of the two depths); analytical and quality assurance methods shall be in accordance with the most recent edition of *Standard Methods for the Examination of Water and Wastewater*.

(3) Upon determination by DEQ that the values in OAR 340-41-150(1) are exceeded, DEQ shall:

(a) In accordance with a schedule approved by the Commission, conduct such studies as are necessary to describe present water quality; determine the impacts on beneficial uses; determine the probable causes of the exceedance and beneficial use impact; and develop a proposed control strategy for attaining compliance where technically and economically practicable. Proposed strategies could include standards for additional pollutant parameters, pollutant discharge load limitations, and other such provisions as may be appropriate.

Where natural conditions are responsible for exceedance of the values in OAR 340-41-150(1) or beneficial uses are not impaired, the values in OAR 340-41-150(1) may be modified to an appropriate value for that water body;

(b) Conduct necessary public hearings preliminary to adoption of a control strategy, standards or modified values after obtaining Commission authorization;

(c) Implement the strategy upon adoption by the Commission;

(4) In cases where waters exceed the values in OAR 340-41-150(1) and the necessary studies are not completed, DEQ may approve new activities (which require DEQ approval), new or additional (above the current approved permit limits) discharge loadings from point sources provided that it is determined that beneficial uses would not be significantly impaired by the new activity or discharge.

Application of Standard: Certain types of wastes in water, under proper ambient conditions, may stimulate nuisance algal growths. The magnitude of such growths is determined by measuring chlorophyll a, a photosynthetic pigment which is very closely correlated to biomass. OAR 340-41-150 sets forth a process for determining when phytoplankton growths may be reaching nuisance proportions. This rule is designed to trigger further study and control strategies if the chlorophyll a values exceed specified levels in streams or lakes. Where natural conditions are responsible for the algal blooms, the existing level of chlorophyll a is considered to be the upper level of acceptability.

Present Condition: There is no monitoring data on nuisance phytoplankton growth in the lower Columbia River.

Applicant's Position: The applicant did not provide data,, nor an evaluation of the project on nuisance phytoplankton growth.

Public Testimony: No public testimony was offered on this criterion.

DEQ Evaluation: The potential for nuisance phytoplankton growth arising from this project is not apparent.

DEQ Finding: No violation of the standard for nuisance phytoplankton growth will arise from this project.

Dissolved Oxygen

340-41-0205/340-41-0445 (2) No wastes shall be discharged and no activities shall be conducted which either alone or in combination with other wastes or activities will cause violation of the following standards in the waters of the North Coast -- Lower Columbia River Basin:

(a) Dissolved oxygen (DO): The changes adopted by the Commission on January 11, 1996, become effective July 1, 1996. Until that time, the requirements of this rule that were in effect on January 10, 1996, apply:

(A) For waterbodies identified by DEQ as providing salmonid spawning, during the periods from spawning until fry emergence from the gravels, the following criteria apply:

(i) The dissolved oxygen shall not be less than 11.0 mg/l. However, if the minimum intergravel dissolved oxygen, measured as a spatial median, is 8.0 mg/l or greater, then the DO criterion is 9.0 mg/l;

(ii) Where conditions of barometric pressure, altitude, and temperature preclude attainment of the 11.0 mg/l or 9.0 mg/l criteria, dissolved oxygen levels shall not be less than 95 percent of saturation.

(B) For waterbodies identified by DEQ as providing salmonid spawning during the period from spawning until fry emergence from the gravels, the spatial median intergravel dissolved oxygen concentration shall not fall below 6.0 mg/l;

(C) A spatial median of 8.0 mg/l intergravel dissolved oxygen level shall be used to identify areas where the recognized beneficial use of salmonid spawning, egg incubation and fry emergence from the egg and from the gravels may be impaired and therefore require action by DEQ. Upon determination that the spatial median intergravel dissolved oxygen concentration is below 8.0 mg/l, DEQ may, in accordance with priorities established by DEQ for evaluating water quality impaired waterbodies, determine whether to list the waterbody as water quality limited under the Section 303(d) of the Clean Water Act, initiate pollution control strategies as warranted, and where needed cooperate with appropriate designated management agencies to evaluate and implement necessary best management practices for nonpoint source pollution control;

(D) For waterbodies identified by DEQ as providing cold-water aquatic life, the dissolved oxygen shall not be less than 8.0 mg/l as an absolute minimum. Where conditions of barometric pressure, altitude, and temperature preclude attainment of the 8.0 mg/l, dissolved oxygen shall not be less than 90 percent of saturation. At the discretion of DEQ, when

DEQ determines that adequate information exists, the dissolved oxygen shall not fall below 8.0 mg/l as a 30-day mean minimum, 6.5 mg/l as a seven-day minimum mean, and shall not fall below 6.0 mg/l as an absolute minimum (Table 21);

(E) For waterbodies identified by DEQ as providing cool-water aquatic life, the dissolved oxygen shall not be less than 6.5 mg/l as an absolute minimum. At the discretion of DEQ, when DEQ determines that adequate information exists, the dissolved oxygen shall not fall below 6.5 mg/l as a 30-day mean minimum, 5.0 mg/l as a seven-day minimum mean, and shall not fall below 4.0 mg/l as an absolute minimum (Table 21);

(F) For waterbodies identified by DEQ as providing warm-water aquatic life, the dissolved oxygen shall not be less than 5.5 mg/l as an absolute minimum. At the discretion of DEQ, when DEQ determines that adequate information exists, the dissolved oxygen shall not fall below 5.5 mg/l as a 30-day mean minimum, and shall not fall below 4.0 mg/l as an absolute minimum (Table 21);

(G) *For estuarine water, the dissolved oxygen concentrations shall not be less than 6.5 mg/l (for coastal waterbodies);

(H) *For marine waters, no measurable reduction in dissolved oxygen concentration shall be allowed.

* Applies to the North Coast – Lower Columbia sub-basin only.

Application of Standard: Dissolved oxygen is essential for maintaining aquatic life. Historically, the depletion of dissolved oxygen was one of the most frequent water pollution problems. Its effect on aquatic organisms, especially at low concentrations, has been studied extensively. Sensitivity to low dissolved oxygen concentrations differs between species, between various life stages (egg, larvae, and adults), and between different life processes (feeding, growth, and reproduction).

Present Condition: The water quality standard for dissolved oxygen for the lower Columbia River is for cold-water aquatic life. Monitoring data held in Storet disclose dissolved oxygen concentrations ranging between 9.0 mg/l and 15.8 mg/l.

Applicant's Position: Dredging has the potential to cause short-term localized decreases in dissolved oxygen in confined areas of fine-grained organic rich sediments. The potential for such impacts from the proposed project is negligible due to the location and nature of the material to be dredged. Specifically, dredging will predominantly occur in the open channel where the sediments are low in organic material. Water quality effects for the channel improvement project would be similar to what is encountered during maintenance of the current 40-foot channel. It is not anticipated that construction or maintenance of the project would contribute to dissolved

oxygen concentration reductions that exceed the applicable water quality criterion (Corps, 2003, 6-18).

Public Testimony: As organic matter is disturbed, dissolved oxygen levels will decrease.

The Miller-Pillar and Lois Island ecosystem restoration sites and the temporary sump adjacent to Lois Island will fail to meet the dissolved oxygen criteria.

Dissolved oxygen reductions should be allowed at no greater level than 0.1 mg/l. There is no data to support that the project will be able to meet this.

DEQ Evaluation: DEQ concurs with the applicant that dredging and disposal will result in short-term, highly localized reductions in the quantity of dissolved oxygen in those areas in which finer grained sediment and organics may be present. This is not the nature of the sediments in the current navigation channel itself. For areas outside the navigation channel, there is insufficient data.

DEQ Finding: The Columbia River has more than sufficient flow to attenuate small reductions in dissolved oxygen levels. DEQ does not believe this will a problem in the main navigation channel. However, due to lack of characterization of sediments on the side slopes of the channel, and areas outside the channel, dissolved oxygen should be monitored, and activity modified, or stopped, if dissolved oxygen levels fall below the criteria.

Temperature

340-41-0205/340-41-0445 (b) Temperature: The changes adopted by the Commission on January 11, 1996, become effective July 1, 1996. Until that time, the requirements of this rule that were in effect on January 10, 1996, apply. The method for measuring the numeric temperature criteria specified in this rule is defined in OAR 340-041-0006(54):

(A) To accomplish the goals identified in OAR 340-041-0120(11), unless specifically allowed under a Department-approved surface water temperature management plan as required under OAR 340-041-0026(3)(a)(D), no measurable surface water temperature increase resulting from anthropogenic activities is allowed:

(i) In a basin for which salmonid fish rearing is a designated beneficial use, and in which surface water temperatures exceed 64.0°F (17.8°C);

(ii) In the Columbia River or its associated sloughs and channels from the mouth to river mile 309 when surface water temperatures exceed 68.0°F (20.0°C);

(iii) In waters and periods of the year determined by DEQ to support native salmonid spawning, egg incubation, and fry emergence from the egg and from the gravels in a basin which exceeds 55.0°F (12.8°C);

(iv) In waters determined by DEQ to support or to be necessary to maintain the viability of native Oregon bull trout, when surface water temperatures exceed 50.0°F (10.0°C);

(v) In waters determined by DEQ to be ecologically significant cold-water refugia;

(vi) In stream segments containing federally listed Threatened and Endangered species if the increase would impair the biological integrity of the Threatened and Endangered population;

(vii) In Oregon waters when the dissolved oxygen (DO) levels are within 0.5 mg/l or 10 percent saturation of the water column or intergravel DO criterion for a given stream reach or subbasin;

(viii) In natural lakes.

(B) An exceedance of the numeric criteria identified in subparagraphs (A)(i) through (iv) of this subsection will not be deemed a temperature standard violation if it occurs when the air temperature during the warmest seven-day period of the year exceeds the 90th percentile of the seven-day average daily maximum air temperature calculated in a yearly series over the historic record. However, during such periods, the anthropogenic sources must still continue to comply with their surface water temperature management plans developed under OAR 340-041-0026(3)(a)(D);

(C) Any source may petition the Commission for an exception to subparagraphs (A)(i) through (viii) of this subsection for discharge above the identified criteria if:

(i) The source provides the necessary scientific information to describe how the designated beneficial uses would not be adversely impacted; or

(ii) A source is implementing all reasonable management practices or measures; its activity will not significantly affect the beneficial uses; and the environmental cost of treating the parameter to the level necessary to assure full protection would outweigh the risk to the resource.

(D) Marine and estuarine waters: No significant increase above natural background temperatures shall be allowed, and water temperatures shall not be altered to a degree which creates or can reasonably be expected to create an adverse effect on fish or other aquatic life.

Application of Standard: Oregon's water temperature standard for the Columbia River was adopted by the Environmental Quality Commission (EQC) based on research regarding effects of water temperature on salmonid productivity, modeling temperature effects of various activities, and identification of sensitive habitats.

Water quality criteria produced by national fishery experts, and provided by the federal Water Pollution Control Administration, recommended a maximum not-to-be exceeded temperature of 68°F. for salmonid growth and migration routes and 55°F. for salmonid spawning and egg development waters. Because of the number of trout and salmon waters that had been destroyed or made marginal or non-productive nationwide, it was further recommended that the remaining trout and salmon waters be protected. "Inland trout streams and headwaters of salmon streams should not be warmed."

As temperatures increase above the optimal range, spawning and egg development becomes rapidly impaired, thus limiting reproduction. With increasing temperature, trout experience sublethal effects of impaired feeding, decreased growth rates, reduced resistance to disease and parasites, increased sensitivity to toxics, intolerance with migration, reduced ability to compete with more temperature resistant species, and increased vulnerability to predation. If temperatures are high enough for sustained periods, mortality occurs. In addition, other water quality parameters (such as dissolved oxygen) may also be adversely affected by elevated temperatures. Based on the available information, the temperature standard was established with the primary intent of protecting the resident trout populations. It was recognized that natural temperatures may exceed the desirable upper limit for protection of trout -- established in the standard as 68°F. However, the determination made in the adoption of the standard was that when temperatures are above the 68°F. optimum established as the upper limit in the standard, discharges of waste or activities which cause a measurable increase should not be allowed.

At the time the temperature standard was adopted, the water pollution control program in Oregon arguably focused on point source discharges. As a result, the temperature standard was worded

to apply to point source discharges of heated wastewater. The reference to "mixing zone", "a control point immediately upstream from a discharge", and "single source discharge" all apply to point source discharges. However, the initial wording of the standard in OAR 340-41-basin(2) which reads "No wastes shall be discharged and no *activities* shall be conducted which either alone or in combination with other wastes or *activities* will cause violation....." (*emphasis added*) clearly implies an intent to have broader application than just to point source discharges.

DEQ has traditionally applied the temperature standard to activities that cause a change in temperature as well as to discharges that cause a change in temperature. The intent is to protect the fishery values that the standard was adopted to protect. Thus, if natural temperatures are above 68°F., a point source discharge will not be approved if it will cause a measurable increase in temperature outside of a limited size "mixing zone" which is established in the waste discharge permit for the source. (The mixing zone size and shape is established to assure that beneficial uses are not impaired, including fishery uses.) Similarly, an activity or project that does not result in a discharge of waste but would cause a measurable increase in the temperature of the stream compared to the temperature that would exist without the activity or project would not be approved.

Another consideration in applying the existing temperature standard is a determination of what is measurable in terms of a temperature increase. The wording of the standard itself implies that something less than 0.5°F. is measurable. Since temperature in water naturally varies due to influence of sunlight and air temperatures, effective measurement of temperature changes in the stream can be difficult. Evaluation of temperature impacts of proposed discharges or activities generally is done using a variety of modeling techniques. In interpreting model results, DEQ has typically assumed that a calculated temperature increase of less than 0.25°F would not be measurable in the stream.

Present Condition: The Columbia River mainstem is listed on the 303(d) list as water quality limited for temperature from the mouth to Bonneville Dam. The listings pertain to the summer months. Modeling work on a temperature TMDL for the mainstem Columbia River and the Snake River from its mouth at the Columbia to its confluence with the Salmon River discloses that the major impacts to temperature occur as a result of impoundments behind dams, and with the confluence of the Snake River. For the numerous point sources along the river, their impact is de minimus. Only a very few of the largest dischargers have any effect on the river.

Applicant's Position: The current temperature regime in the river is captured in the evaluation of existing conditions. Temperature changes could occur within the river and estuary for a number of reasons, including salinity changes, depth changes, and velocity changes. Modeling results reviewed by NOAA Fisheries and USFWS indicate that these potential factors for changing temperature conditions are not significantly altered by the proposed project activities. Therefore, no impact to salmonids is anticipated due to temperature change.

Hydraulic analyses have predicted no change in water surface elevations downstream of CRM 80 and only very slight (0.0-0.2 feet) upstream of CRM 80. The impact on summer water temperatures, if any, for such a small change in elevation of the river is not expected to be

measurable. The potential for temperature change, if any, was considered during the SEI expert panel ESA review and is included in the BA.

There is no evidence the proposed action will increase river stratification. There is very little stratification in the river now. Thermistor strings deployed in the forebays of the three lower Columbia River dams show that stratification is a temporary event that occurs during extended runs of hot weather, and then the stratification only extends a few feet below the surface and lasts for only a few days. These are deep sites so we can expect even less stratification to occur in the shallower water between Bonneville and the estuary. In the estuary, the salinity intrusion modeling results did not indicate any alteration of existing stratification patterns.

Public Testimony: The project will result in an increase in surface water temperatures at low flows.

Increased turbidity as a result of the project will absorb more solar radiation, increasing temperatures.

Dredged spoils placed in areas of the river greater than 65 feet in depth will result in loss of depth, and therefore loss of cooling.

The deeper channel could cool water in the estuary, and this may not be good for salmon.

The creation of shallow water habitat by the ecosystem restoration projects may result in an increase in water temperatures. This will harm salmon directly and may encourage the presence of warm water predators.

DEQ Evaluation: Given the very high flows, even at low flow times, in the river, this project will neither contribute to, nor detract from the temperature regime in the river. Temperature standard exceedances on the river are produced by very large contributors such as dam forebays and the Snake River. This project is miniscule compared to these.

DEQ Finding: No violation of the numeric or narrative criteria for temperature is expected.

Turbidity

340-41-0205/340-41-0445 (c) Turbidity (Nephelometric Turbidity Units, NTU): No more than a ten percent cumulative increase in natural stream turbidities shall be allowed, as measured relative to a control point immediately upstream of the turbidity causing activity. However, limited duration activities necessary to address an emergency or to accommodate essential dredging, construction or other legitimate activities and which cause the standard to be exceeded may be authorized provided all practicable turbidity control techniques have been applied and one of the following has been granted:

(A) Emergency activities: Approval coordinated by DEQ with DEQ of Fish and Wildlife under conditions they may prescribe to accommodate response to emergencies or to protect public health and welfare;

(B) Dredging, Construction or other Legitimate Activities: Permit or certification authorized under terms of Section 401 or 404 (Permits and Licenses, Federal Water Pollution Control Act) or OAR 14l-085-0100 et seq. (Removal and Fill Permits, Division of State Lands), with limitations and conditions governing the activity set forth in the permit or certificate.

Application of Standard: Turbidity in water results from particulate matter being held in suspension. The standard is designed to minimize the addition of soil particles or any other suspended substances that would cause significant increases in the river's normal, seasonal turbidity pattern.

Present Condition: A review of Storet data for the past two years discloses the following turbidity levels. The sampling station is located at river mile 102.5 on the Columbia River.

Table 2: Columbia River Turbidity 1998-1999

Sampling Date	Turbidity (NTUs)
Oct-13-1997	7
Jan-27-1998	5
Apr-14-1998	-
Jun-2-1998	26
Aug-24-1998	4.5
Oct-5-1998	3
Dec-15-1998	4
Feb-2-1999	10
Apr-22-1999	9
Jul-7-1999	12
Aug-31-1999	3
Oct-13-1999	3

Applicant's Position: Dredging of fine-grained organic rich sediments could result in limited short-term elevations of chemicals and possible decrease in dissolved oxygen in the immediate area of the dredging and disposal sites. However, Columbia River navigation channel sediments are predominately medium to coarse grain sand with less than 1% silt or clay and thus differ significantly from the discussion in this paragraph regarding fine-grained, organic rich sediments. Short-term turbidity increases (cloudiness of the water caused by suspended particles) would also be expected from inwater disposal actions. Turbidity measurements were conducted at a beach nourishment site and at an in-water (flowlane) disposal site in the Columbia River. Additional monitoring was conducted at Morgan's Bar during placement of material dredged from the Willamette River. Most material was found to settle rapidly to the bottom with minimum suspension of sediment. This also was true for the fine-grained material from the Willamette River placed at Morgan's Bar.

Background turbidity levels upstream of the disposal site prior to disposal were measured at 3.55, 3.28 and 3.10 NTUs (nephelometric turbidity unit, a unit of measure for turbidity levels in water). Many readings were subsequently measured below this level during disposal site turbidity monitoring. A minimum turbidity reading of 1.82 NTU was recorded while a maximum of 14.38 NTU was recorded. A reading of 12.38 NTU was recorded from water noted to be discolored washing around the front of the open scow while the disposal scow turned to return after disposal. The scow had not yet closed the hopper. This was the only station where water was visibly discolored on the surface. The area affected was minimal and the effect transitory. No other significant discoloration was noted on the surface during or after discharge of the dredged material.

Turbidity induced by dredging and dredged material discharge in the Columbia River appears to be limited and transitory in nature. This is attributable to the coarseness of the dredged material and the lack of fines present. Compared to natural fluctuations in suspended sediment levels, dredging-induced turbidity would be a minor constituent to the Columbia River system.

Public Testimony: The turbidity standard will be exceeded during flowlane disposal, use of the sump adjacent to Lois Island, during discharge at Lois Island, the Miller-Pillar restoration project, and at Martin Island.

Of the increased turbidity produced by dredging, some sediments will settle out, but others will remain in suspension due to particle size.

During upland disposal, return water contains silt. This will remain near the shore in a plume where migrating salmon prefer to be.

Dredging may decrease natural turbidity as sediments sink into the channel.

Turbidity will bring up heavy metals from the bottom.

DEQ Evaluation: Naturally occurring turbidity levels in the river are highly variable, rising to high levels during high flow events. Contributions to turbidity from dredging will be negligible

compared to natural variations. The incidence of fine sediments in the navigation channel is very low. Sediments suspended during dredging will, therefore, settle out quickly. Such contributions as there will be are covered under the short-term exception criteria in the standard.

Nonetheless, areas outside the 600-foot navigation channel that have not been extensively characterized are suspected to contain greater quantities of fine-grained material, that may contribute to elevated turbidity.

DEQ Finding: No exceedances of the turbidity standard are expected in the navigation channel during dredging. In order to ensure that the turbidity criteria are not violated within the channel, and especially in areas outside the channel, turbidity measurements are to be made and documented. If turbidity levels exceed the ten percent standard 100 feet below dredging or flowlane disposal, the activity must be modified or halted until turbidity returns to within the ten percent standard.

A definition of "limited duration," as applied here is the measurement point 100 feet downstream from dredging or disposal activity.

pH (Hydrogen Ion Concentration)

340-41-0205/340-41-0445 (d) pH (hydrogen ion concentration): pH values shall not fall outside the following ranges:

(A) Marine waters: 7.0 - 8.5;

(B) Estuarine and fresh waters: 6.5 - 8.5. The following exception applies:
Waters impounded by dams existing on January 1, 1996, which have pHs that exceed the criteria shall not be considered in violation of the standard if DEQ determines that the exceedance would not occur without the impoundment and that all practicable measures have been taken to bring the pH in the impounded waters into compliance with the criteria.

(C) * Cascade lakes above 3,000 feet altitude: pH values shall not fall outside the range of 6.0 to 8.5.

* Applies only to the Willamette Basin

Application of Standard: pH values relate to the balance of acid and alkaline substances in the water. The theoretical range is from 1 (very acid) to 14 (very alkaline). Most streams in Oregon have pH values falling somewhere between 6.5 and 8.5. There may be seasonal fluctuations in the pH number due to substances entering the water from land or bio-chemical activity in the water. Since the fish and other aquatic life in any particular stream have evolved under rather specific pH conditions, it is important to set a pH standard that reflects natural conditions and will prevent any intolerable acid/alkalinity imbalances.

Present Condition: Monitoring on the river shows that the river meets the hydrogen ion concentration criteria.

Applicant's Position: The proposed project will have little impact on the chemical, physical and biological properties of the lower Columbia River because the proposed action involves dredging primarily clean sand from the navigation channel. There have been numerous physical and chemical tests of the riverbed material that indicate it is clean sand (see sediment quality comments). The project will neither add to nor decrease the contribution of pH to the river. Therefore, there should be no reasonable potential to violate the pH water quality standard.

Public Testimony: No public testimony was received for this criterion.

DEQ Evaluation: The project will not contribute to hydrogen ion concentrations.

DEQ Finding: No violation of this standard is expected as a result of this project.

Bacteria

340-41-0205/340-41-0445 (e) Bacteria standards:

(A) Numeric Criteria: Organisms of the coliform group commonly associated with fecal sources (MPN or equivalent membrane filtration using a representative number of samples) shall not exceed the criteria described in subparagraphs (i) and (ii) of this paragraph:

(i) Freshwaters and Estuarine Waters Other than Shellfish Growing Waters:

(I) A 30-day log mean of 126 *E. coli* organisms per 100 ml, based on a minimum of five (5) samples;

(II) No single sample shall exceed 406 *E. coli* organisms per 100 ml.

(ii) Marine Waters and Estuarine Shellfish Growing Waters: A fecal coliform median concentration of 14 organisms per 100 milliliters, with not more than ten percent of the samples exceeding 43 organisms per 100 ml.

(B) Raw Sewage Prohibition: No sewage shall be discharged into or in any other manner be allowed to enter the waters of the State unless such sewage has been treated in a manner approved by DEQ or otherwise allowed by these rules;

(C) Animal Waste: Runoff contaminated with domesticated animal wastes shall be minimized and treated to the maximum extent practicable before it is allowed to enter waters of the State;

(D) Effluent Limitations and Water Quality Limited Waterbodies: Effluent limitations to implement the criteria in this rule are found in OAR 340-041-0120(12) through (16). Implementation of the criteria in this rule in water quality limited waterbodies is described in OAR 340-041-0026(3)(a)(I) and OAR 340-041-0120(17).

Application of Standard: This is a stream standard of public health significance which takes into account the cumulative impacts of all coliform bacteria discharges; however, its major emphasis is on the control of human fecal coliform bacteria sources.

Present Condition: Bacteria discharges to the Columbia River occur at Portland and Astoria as a result of municipal wastewater discharges. Both of these sources are under agreed Orders from DEQ.

Applicant's Position: The applicant does not see the project contributing to bacteria.

Public Testimony: No public testimony was received for this parameter.

DEQ Evaluation: The project will not involve the discharge of bacteria.

DEQ Finding: No violation of this water quality standard is expected.

Bacterial Pollution

340-41-0205/340-41-0445 (f) Bacterial pollution or other conditions deleterious to waters used for domestic purposes, livestock watering, irrigation, bathing, or shellfish propagation, or otherwise injurious to public health shall not be allowed;

Application of Standard: This standard is designed to allow the regulation of bacterial sources other than coliform organisms that may be a public health hazard.

Present Condition: There is no data on this condition. There is, however, nothing to indicate that it is a problem.

Applicant's Position: The applicant provided no information on bacterial pollution.

Public Testimony: No public testimony was received related to this criterion.

DEQ Evaluation: No bacteria will be produced as a result either of dredging or of sediment disposal.

DEQ Finding: No violation of this water quality standard is expected.

Dissolved Gasses

340-41-0205/340-41-0445 (g) The liberation of dissolved gases, such as carbon dioxide, hydrogen sulfide, or other gases, in sufficient quantities to cause objectionable odors or to be deleterious to fish or other aquatic life, navigation, recreation, or other reasonable uses made of such waters shall not be allowed;

Application of Standard: This rule refers to noxious gases that sometimes result from putrescible substances in the water. Such substances may be from discharged wastes or they may be from accumulations of naturally occurring organic debris settled in stream or reservoir bottoms. Such gases have two primary adverse properties when in excess concentrations: (1) some can be directly toxic to aquatic life, and (2) others consume dissolved oxygen which may lead to indirect mortalities. Also, some decomposition gases stink, especially hydrogen sulfide.

Present Condition: There is no data on this condition. There is, however, nothing to indicate that it is a problem.

Applicant's Position: The applicant provided no information relating to this standard.

Public Testimony: No public testimony was received relating to this parameter.

DEQ Evaluation: Neither dredging nor sediment disposal is expected to cause, or contribute to the liberation of dissolved gases in water.

DEQ Finding: No violation of this water quality standard is expected.

Fungi or Other Growths

340-41-0205/340-41-0445 (h) The development of fungi or other growths having a deleterious effect on stream bottoms, fish or other aquatic life, or which are injurious to health, recreation, or industry shall not be allowed;

Application of Standard: The discharge of certain nutrient laden wastes may stimulate deleterious growths of fungi, bacterial slime, sulfur bacteria, stalked diatoms, or nuisance levels of algae in receiving streams. Likewise, the slowing of a riverine system to a lake-like reservoir may encourage troublesome accumulations of dead algae and rotting aquatic weeds. The standard was developed to allow preventive regulation of discharges and activities that result in objectionable or deleterious growths.

Present Condition: There is no data on this condition. There is, however, nothing to indicate that it is a problem.

Applicant's Position: The applicant provided no information relating to this standard.

Public Testimony: No public testimony was received relating to this criterion.

DEQ Evaluation: Neither dredging nor sediment disposal is expected to cause, or contribute to fungal or other growths.

DEQ Finding: No violation of this water quality standard is expected.

Deleterious Tastes, Odors or Toxics

340-41-0205/340-41-0445 (i) The creation of tastes or odors or toxic or other conditions that are deleterious to fish or other aquatic life or affect the potability of drinking water or the palatability of fish or shellfish shall not be allowed;

Application of Standard: This standard is self-explanatory in its purpose to prohibit the discharge of substances or creation of conditions that would be toxic to aquatic life, or impart unnatural tastes and odors to water to fish flesh.

Present Condition: There is no data on this condition. There is, however, nothing to indicate that it is a problem.

Applicant's Position: The applicant provided no information relating to this standard.

Public Testimony: No public testimony was received relating to this criterion.

DEQ Evaluation: Neither dredging nor sediment disposal is expected to cause, or contribute to deleterious tastes, odors or toxics. On the issue of toxics, see the discussion under the Toxics standard.

DEQ Finding: No violation of this water quality standard is expected.

Bottom Sludge or Deposits

340-41-0205/340-41-0445 j) The formation of appreciable bottom or sludge deposits or the formation of any organic or inorganic deposits deleterious to fish or other aquatic life or injurious to public health, recreation, or industry shall not be allowed;

Application of Standard: Bottom or sludge deposits may have several adverse impacts:

(1) toxicity;
(2) blanketing and smothering bottom dwelling aquatic life;
(3) decimation of fish food organisms; and/or
(4) hindering the percolation of oxygen bearing water to buried fish eggs.

Present Condition: There is no data on this condition. There is, however, nothing to indicate that it is a problem.

Applicant's Position: The applicant notes that the channel of the Columbia River is quite dynamic, being characterized by long-period sand waves that migrate downstream as sand is transported by the river flow. This contrasts with the habitats at the margins of the river that are characterized by higher deposition areas and finer substrate.

In-water disposal is the placement of material back into the river. In the Columbia River the most common practice is flowlane disposal. Flowlane disposal is in-water disposal within or adjacent to the navigation channel. For the 40-ft channel, flowlane disposal sites may be at depths between 35 and 65 feet deep, but are typically greater than 50 feet deep and downstream of the dredging site. Occasionally disposal depths exceed 65 feet, but only in previously agreed upon locations. Flowlane disposal is distributed along the riverbed to avoid creating mounds. These flowlane disposal practices minimize the
amount of material that can return to the dredging area and also minimize the disruption to the natural downstream movement of sand.

Public Testimony: This standard will be violated during dredging and flowlane disposal. Sediments will deposit in slower moving, shallow, depositional areas. Sediments will build up in deeper sturgeon habitat areas.

DEQ Evaluation: This project can be expected to result in suspension, redeposit and redistribution of bottom sediments. The project has the potential to create accretions of sediment on the bottom of the river and in slower moving depositional areas.

DEQ Finding: Application of best management practices for both dredging and disposal will be required to meet this standard.

No flowlane disposal should occur in areas of the river that are greater than 65 feet in depth.

Flowlane disposal should occur in such a way as to ensure that sediments redeposit in a thin layer on the bottom of the river.

Objectionable Discoloration

340-41-0205/340-41-0445 (k) Objectionable discoloration, scum, oily sleek, or floating solids, or coating of aquatic life with oil films shall not be allowed;

Application of Standard: A considerable number of industrial and domestic wastes have one or more of the water polluting properties identified in the standard. Their impact on water quality may range from simple annoyance to humans and aquatic life to mortality of fish and aquatic life. The control and clean-up of oil spills is also regulated under OAR 340-47-005/025.

Present Condition: There is no data on this condition. There is, however, nothing to indicate that it is a problem.

Applicant's Position: The applicant provided no information relating to this standard.

Public Testimony: No public testimony was received on this parameter

DEQ Evaluation: Neither dredging nor sediment disposal is expected to cause, or contribute to objectionable discoloration of the water. There is always the risk of accidental spills into waters of the State, although with reasonable care these can be avoided. The Oregon Emergency Response System should be notified immediately if any spill occurs.

DEQ Finding: No violation of this water quality standard is expected. The applicant should contact the Oregon Emergency Response System in the event of any spills into waters of the State.

Aesthetic Conditions

340-41-0205/340-41-0445 (l) Aesthetic conditions offensive to the human senses of sight, taste, smell, or touch shall not be allowed;

Application of Standard: Waters of the state should not be made aesthetically offensive to the human senses by the addition of wastes or other adverse manipulation of natural water quality conditions.

Present Condition: There is no data on this condition. There is, however, nothing to indicate that it is a problem.

Applicant's Position: The applicant provided no information relating to this standard.

Public Testimony: No public testimony was received relating to this parameter.

DEQ Evaluation: Dredging and disposal may cause short lived and highly localized turbidity within the bounds of the turbidity standard. However, no aesthetically offensive condition will result from this project.

DEQ Finding: No violation of this water quality standard is expected.

Radioisotope Concentrations

340-41-0205/340-41-0445 (m) Radioisotope concentrations shall not exceed maximum permissible concentrations (MPC's) in drinking water, edible fishes or shellfishes, wildlife, irrigated crops, livestock and dairy products, or pose an external radiation hazard;

Application of Standard: Radioisotopes, by virtue of their ionizing radiation, are harmful to life. There is no accepted safe dosage of radioactivity: all exposure carries risk. The purpose of the standard is to limit their concentration in waters of the state to levels deemed reasonably safe by national and international authorities.

Present Condition: There is no data on this condition.

Applicant's Position: The applicant provided no information relating to this standard.

Public Testimony: No public testimony was received on this parameter.

DEQ Evaluation: Dredging and disposal will not contribute radio nuclides.

DEQ Finding: No violation of this water quality standard is expected.

Total Dissolved Gas

340-41-0205/340-41-0445(n)

(A) The concentration of total dissolved gas relative to atmospheric pressure at the point of sample collection shall not exceed 110 percent of saturation, except when stream flow exceeds the ten-year, seven-day average flood. However, for Hatchery receiving waters and waters of less than two feet in depth, the concentration of total dissolved gas relative to atmospheric pressure at the point of sample collection shall not exceed 105 percent of saturation;

(B) The Commission may modify the total dissolved gas criteria in the Columbia River for the purpose of allowing increased spill for salmonid migration. The Commission must find that:

(i) Failure to act would result in greater harm to salmonid stock survival through in-river migration than would occur by increased spill;

(ii) The modified total dissolved gas criteria associated with the increased spill provides a reasonable balance of the risk of impairment due to elevated total dissolved gas to both resident biological communities and other migrating fish and to migrating adult and juvenile salmonids when compared to other options for in-river migration of salmon;

(iii) Adequate data will exist to determine compliance with the standards; and

(iv) Biological monitoring is occurring to document that the migratory salmonid and resident biological communities are being protected.

(C) The Commission will give public notice and notify all known interested parties and will make provision for opportunity to be heard and comment on the evidence presented by others, except that the Director may modify the total dissolved gas criteria for emergencies for a period not exceeding 48 hours;

(D) The Commission may, at its discretion, consider alternative modes of migration.

Application of Standard: The supersaturation of atmospheric gases in water may cause either crippling or lethal gas bubbles to form in the tissues of fish. The standard, based on scientifically derived evidence, is designed to prohibit discharges or activities that will result in atmospheric gases reaching known harmful concentrations. There are six ways that total dissolved gas supersaturation can occur (EPA 1976 and American Fisheries Society 1979):

1. Excessive biological activity--dissolved oxygen concentrations often reach supersaturation because of excessive algal photosynthesis. Renfro (1963) reported gas bubble disease in fishes resulting, in part, from algal blooms. Algal blooms often

accompany an increase in water temperature and this higher temperature further contributes to supersaturation.

2. Lindroff (1957) reported that water spillage at hydropower dams caused supersaturation. When excess water is spilled over the face of a dam, it entrains air as it plunges to the stilling or plunge pool at the base of the dam. The momentum of the fall carries the water and entrained gases to great depths in the pool; and, under increased hydrostatic pressure, the entrained gases are driven into solution, causing supersaturation of dissolved gases.

3. Natural waterfalls with deep plunge basins can cause supersaturation and subsequent adverse effects to fish (Harvey and Cooper 1962).

4. The use of air in turbine intakes to avoid cavitation creates supersaturation--a condition that can be avoided if identified (McDonald and Hyatt 1973).

5. Venturi action caused by improper engineering of hatchery water supplies has also been described by Harvey and Smith (1961), Wyatt and Beninningen (1971), and Rucker and Tuttle (1948).

5. Gas bubble disease may be induced by discharges from power-generating and other thermal sources (Marcello, et al. 1975). Cool, gas-saturated water is heated as it passes through the condenser or heat exchanger. As the temperature of the water rises, percent saturation increases because of the reduced solubility of gases at high temperatures. Thus, the discharged water becomes supersaturated with gases and fish or other organisms living in the heated water may exhibit gas bubble disease (DeMont and Miller 1972; Malouf, et al. 1972; Keup 1975).

Present Condition: A TMDL has been developed for the lower Columbia River for this parameter. This standard has been exceeded by hydroelectric projects spilling water over dam spillways.

Applicant's Position: The applicant offered no information or data on this standard.

Public Testimony: No public testimony was received relating to this standard.

DEQ Evaluation: The production of elevated total dissolved gas levels requires the entrainment of large quantities of air, and its compression into solution at depth. These factors are not present in this project.

DEQ Finding: No violation of this standard will occur as a result of this project.

Total Dissolved Solids

340-41-0205/340-41-0445 (o) Total Dissolved Solids: Guide concentrations listed below shall not be exceeded unless otherwise specifically authorized by DEQ upon such conditions as it may deem necessary to carry out the general intent of this plan and to protect the beneficial uses set forth in OAR 340-04l-0202:

(A) Columbia River -- 500.0 mg/l;

(B) *All Other Fresh Water Streams and Tributaries -- 100.0 mg/l.

(B) **Willamette River and Tributaries - - 100.0 mg/l

* Applies to North Coast – Columbia Basin Only.
** Applies to Willamette basin Only.

Application of Standard: Certain dissolved chemicals in water are known to be toxic to aquatic life and antagonistic to higher animals when in drinking water at low concentrations. Maximum allowable concentrations of the known toxic or offensive substances have been incorporated in standards for the protection of both aquatic and human life. Water quality may also be affected by a number of other substances (e.g., calcium, sodium, phosphorus, iron, etc.) that may be undesirable either individually or collectively to domestic, industrial, or agricultural uses when in high concentrations. A measurement of their collective concentration in water is specific conductance, which can be used as a surrogate for total dissolved solids.

Present Condition: There is no data on this condition.

Applicant's Position: The applicant provided no information relating to this standard.

Public Testimony: Contaminants may be resuspended during dredging and in-river disposal, and may become bio-available to fish and other aquatic organisms.

DEQ Evaluation: Dredging and disposal may cause short lived and highly localized turbidity within the bounds of the turbidity standard. However, total dissolved solids should remain within standards.

DEQ Finding: No violation of this water quality standard is expected.

Toxic Substances

340-41-0205/340-41-0445 (p) Toxic Substances:

(A) Toxic substances shall not be introduced above natural background levels in the waters of the state in amounts, concentrations, or combinations which may be harmful, may chemically change to harmful forms in the environment, or may accumulate in sediments or bioaccumulate in aquatic life or wildlife to levels that adversely affect public health, safety, or welfare; aquatic life; wildlife; or other designated beneficial uses;

(B) Levels of toxic substances shall not exceed the criteria listed in Table 20 which were based on criteria established by EPA and published in Quality Criteria for Water (1986), unless otherwise noted;

(C) The criteria in paragraph (B) of this subsection shall apply unless data from scientifically valid studies demonstrate that the most sensitive designated beneficial uses will not be adversely affected by exceeding a criterion or that a more restrictive criterion is warranted to protect beneficial uses, as accepted by DEQ on a site specific basis. Where no published EPA criteria exist for a toxic substance, public health advisories and other published scientific literature may be considered and used, if appropriate, to set guidance values;

(D) Bio-assessment studies such as laboratory bioassays or instream measurements of indigenous biological communities, shall be conducted, as DEQ deems necessary, to monitor the toxicity of complex effluents, other suspected discharges or chemical substances without numeric criteria, to aquatic life. These studies, properly conducted in accordance with standard testing procedures, may be considered as scientifically valid data for the purposes of paragraph (C) of this subsection. If toxicity occurs, DEQ shall evaluate and implement measures necessary to reduce toxicity on a case-by-case basis.

Application of Standard: A wide variety of herbicides, pesticides, fungicides, metals, industrial chemicals, and other anthropologic waste products are toxic to biological species. Through widespread use and/or improper disposal, some of these substances resisted degradation and have bioaccumulated to injurious levels in parts of the world. Toxic substances such as heavy metals may be naturally present, but may be mobilized and made available as surface water contaminants by certain anthropogenic activities such as mining or excavation. This standard has been adopted in Oregon to affect a toxic substances management strategy using best available technologies.

Present Condition: The lower Columbia River is currently listed for arsenic, DDT and its metabolites, PAHs and PCBs.

Applicant's Position: The applicant has undertaken sampling and analysis of sediments from the navigation channel and has determined that they are clean course-grained sand. In addition, a group of scientists empanelled by the Sustainable Ecosystems Institute (SEI) met in 2001 and

agreed that the likelihood of toxics or metals in the sediments of the navigation channel is extremely low.

The applicant however, notes that there are several sites along the shoreline that have contaminated sediment concerns. Most of these sites are more than 1,000 feet from the channel, and will not likely be affected by dredging.

Public Testimony: More public testimony was offered on this than on any other water quality parameter.

There are already water quality listings for PCBs, DDT, DDE and dioxin and fish advisories to protect human health issued for the lower Columbia River.

Contaminants will be resuspended during dredging and flowlane disposal.

Additional testing for tributyltin needs to be undertaken. It has been identified at the east end of the mooring basin in Astoria and in other berthing areas.

Insufficient numbers, and depth, of samples have been undertaken by the Corps.

Turbidity will bring up heavy metals from the bottom.

Toxics are resident in cracks in rocks that will be resuspended during blasting operations.

DEQ Evaluation: DEQ concurs with the applicant's position relative to sediments in the navigation channel. However, the project envisages dredging in areas outside the navigation channel, specifically, turning bays and areas that may need to be dredged to stabilize the sides of the channel, or where compacted sediments or rock force the channel to be reconfigured.

DEQ Finding: No toxic contaminants or metals are expected to be liberated or redistributed as a result of dredging the navigation channel. However, additional characterization of sediments in areas outside the navigation channel will be required prior to dredging and disposal.

Natural Conditions

340-41-205 (3) Where the naturally occurring quality parameters of waters of the North Coast - Lower Columbia River Basin are outside the numerical limits of the above assigned water quality standards, the naturally occurring water quality shall be the standard. However, in such cases special restrictions, described in OAR 340-041-0026(3)(a)(C)(iii), apply to discharges that affect dissolved oxygen.

340-41-0445 (3) Where the naturally occurring quality parameters of waters of the Willamette River Basin are outside the numerical limits of the above assigned water quality standards, the naturally occurring water quality shall be the standard. However, in such cases special restrictions, described in OAR 340-041-0026(3)(a)(C)(iii), apply to discharges that affect dissolved oxygen.

Application of Standard: The purpose of this standard is to ensure that where natural (non-anthropogenic) causes result in water quality that exceeds the criteria specified above, that the naturally occurring condition shall be the standard.

Present Condition: While there is limited data on parameters other than those on DEQ's 303(d) list of water quality limited water bodies, there is nothing to suggest that water quality criteria are above criteria in the river.

Applicant's Position: The applicant offered no information or data on this parameter.

Public Testimony: No public testimony was received for this criterion.

DEQ Evaluation: This is a "catch-all" standard, providing that standards be set at current criteria where these are better than the criteria. Some existing conditions are better than the criteria, for example, temperature in the high flow, cooler months. Nothing in this project is expected to result in a criterion that is lower than existing.

DEQ Finding: No violation of this criterion is expected.

Antidegradation

340-41-0026 (1) In order to maintain the quality of waters in the State of Oregon, the following is the general policy of the EQC:

(a) Antidegradation Policy for Surface Waters. The purpose of the Antidegradation Policy is to guide decisions that affect water quality such that unnecessary degradation from point and nonpoint sources of pollution is prevented, and to protect, maintain, and enhance existing surface water quality to protect all existing beneficial uses. The standards and policies set forth in OAR 340-041-0120 through 340-041-0962 are intended to implement the Antidegradation Policy;

(A) High Quality Waters Policy: Where existing water quality meets or exceeds those levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, and other designated beneficial uses, that level of water quality shall be maintained and protected. The Environmental Quality Commission, after full satisfaction of the intergovernmental coordination and public participation provisions of the continuing planning process, and with full consideration of sections (2), (3) and (5) of this rule, however, may allow a lowering of water quality in these high quality waters if they find:

(i) No other reasonable alternatives exist except to lower water quality; and

(ii) The action is necessary and justifiable for economic or social development benefits and outweighs the environmental costs of lowered water quality; and

(iii) All water quality standards will be met and beneficial uses protected.

(B) The Director or a designee may allow lower water quality on a short term basis in order to respond to emergencies or to otherwise protect public health and welfare;

(C) Water Quality Limited Waters Policy: For water quality limited waterbodies, the water quality shall be managed as described in section (3) of this rule;

Application of Standard: These sections, which are part of Oregon's water quality standards, require that existing high quality waters where quality exceeds the levels necessary to protect fish, shellfish, wildlife, and recreation shall be maintained and protected unless the Environmental Quality Commission chooses to allow lowered water quality for justifiable reasons, or unless the Director allows lower water quality on a short-term basis to respond to emergencies or otherwise protect public health and welfare. These sections further require DEQ to minimize degradation of high quality waters and protect the recognized beneficial uses of such waters by requiring the highest and best practicable control of all waste discharges and activities. These sections, in conjunction with other provisions of the water quality standards contained in OAR 340- 41-0445(2), are intended to assure that water quality is not changed so as to impair designated beneficial uses of the water.

DEQ is required to interpret and apply the EQC water quality standards, including the antidegradation policy, in a manner consistent with the guiding federal rules. DEQ has traditionally interpreted the antidegradation policy to allow approval of new discharges or activities that may have some theoretical or detectable impact on high quality waters provided that:

1. Adverse impact on water quality will not be significant,

2. Any change in water quality will not adversely affect designated beneficial uses, and

3. Highest and best practicable treatment and control of waste discharges and activities is employed to minimize any adverse effects on water quality.

Under ordinary circumstances, compliance with the water quality standards in OAR 340-41-0205 and 340-41-0445 would be considered sufficient to assure that beneficial uses will be protected. However, if a standard has not been adopted for a pollutant parameter of concern, or if new information indicates that an existing standard is not adequate to prevent adverse water quality impact on a beneficial use in the particular situation, DEQ is required to impose more stringent water quality protection measures to protect designated beneficial uses, including denial of project approval if necessary.

Present Condition: The waters of the Columbia River are not a high quality waters. The lower Columbia River is listed on DEQ's 303(d) list of waterbodies not meeting standards for temperature, arsenic, DDT and its metabolites, PAHs and PCBs. Total maximum daily loads (TMDLs) exist of total dissolved gas and dioxin.

Applicant's Position: The applicant offers no specific comment on this water quality parameter, but believes that the project will not result in degradation of the Columbia River's water quality below current levels.

Public Testimony: This project will result in releases of contaminants already listed on DEQ's 303(d) list of waterbodies failing to meet water quality standards.

DEQ Evaluation: The waters of the Columbia River are not high quality waters. Further, the narrative and numeric criteria, in conjunction with applicable TMDLs are protective of beneficial uses. No degradation of water quality is expected from this project that will cause impairment to beneficial uses.

DEQ Finding: No lowering of water quality is expected from this project if best management practices are employed, and the conditions formulated by DEQ in the certification are followed.

EVALUATION OF WATER QUALITY-RELATED REQUIRMENTS OF STATE LAW

DEQ has reviewed the information in the record and the requirements of the state laws to determine the water quality-related requirements that may be applicable to the applicant's proposed project. In determining whether particular requirements may be water quality-related, DEQ has relied on the following considerations:

a. The statute, or rules promulgated pursuant to the statute, contain explicit reference to water quality and are applicable to the proposed project.

b. The statute, or rules promulgated pursuant to the statute, address factors that are necessary for maintenance of water quality in conjunction with the proposed project, or for evaluation of water quality impacts of the proposed project.

c. The statute, or rules promulgated pursuant to the statute, authorize, require, or control actions or activities that may, in conjunction with the proposed project, be reasonably expected to impact water quality.

Based on these initial criteria, DEQ has identified the following as potential water quality-related requirements of state law:

Laws Administered by the Oregon Division of State Lands

ORS 541.605-695 requires that permits be obtained from the Division of State Lands prior to any fill and removal of material from the bed or banks of any stream. Such permits, when issued, may be expected to contain conditions to assure protection of water quality so as to protect fish and aquatic habitat.

Laws Administered by DEQ of Fish and Wildlife

ORS 496.435 addresses restoration of native stocks of salmon and trout to historic levels of abundance.

OAR 635-007-510 prevents serious depletion of any indigenous fish species through protection of native ecological communities.

OAR 635-007-523 requires support of habitat protection and restoration on private and public lands.

OAR 635-500-020 requires protection and restoration of steelhead spawning and rearing habitat.

OAR 635-500-120 requires protection, restoration, and enhancement of trout habitat.

Laws Administered by DEQ of Environmental Quality

ORS 454.705 et. seq. and OAR Chapter 340, Divisions 71 and 73 contain requirements which govern on-site disposal of sewage. The purpose of such rules is to prevent health hazards and protect the quality of surface water and groundwater. DEQ administers and enforces on-site sewage disposal systems and requirements in Counties.

ORS 466.605 et. seq. and ORS 468.780-815 establish requirements for reporting and cleanup of spills of petroleum products and hazardous materials.

ORS 468.742 requires submittal of plans and specifications for water pollution control facilities to DEQ for review and approval prior to construction. One of the purposes of these statutes, and rules promulgated pursuant thereto, is to prevent contamination of surface or groundwater.

Laws Administered by DEQ of Land Conservation and Development

ORS Chapter 197 contains provisions of state law requiring the development and acknowledgement of comprehensive land use plans. This chapter also requires state agency actions to be consistent with acknowledged local land use plans and implementing ordinances.

In addition to this state agency review of the § 401 certification documents, the Clatsop County Planning Department has provided a Land Use Compatibility Statement indicating areas in which the project is inconsistent with the local comprehensive plan.

DEQ of Land Conservation and Development has developed a Coastal Zone Management Act consistency determination for this project.

Laws Administered by Water Resources Department

Laws administered by the Water Resources Department relate to issuance and administration of water withdrawal rights. No water withdrawals requiring State water rights are contemplated in this project.

Summary

Pursuant to 33 USC 1341(d) and OAR 340-048-0025, DEQ has included conditions in the § 401 certification that are consistent with these other requirements of state law.

EVALUATION OF COMPLIANCE WITH SECTIONS 301, 302, 303, 306, AND 307 OF THE CLEAN WATER ACT

In order to certify a project pursuant to § 401 of the federal Clean Water Act, DEQ must find that the project complies with Sections 301, 302, 303, 306, and 307 of the Act and state regulations adopted to implement these sections.

Sections 301, 302, 306, and 307 of the federal Clean Water Act deal with effluent limitations, water quality related effluent limitations, national standards of performance for new sources, and toxic and pretreatment standards. All of these requirements relate to point source discharges and are the foundation for conditions to be incorporated in National Pollutant Discharge Elimination System (NPDES) permits issued to the point sources.

Section 303 of the Act relates to Water Quality Standards and Implementation Plans. The federal Environmental Protection Agency (EPA) has adopted regulations to implement Section 303 of the Act. The EQC has adopted water quality standards consistent with the requirements of Section 303 and the applicable EPA rules. The EQC standards are codified in Oregon Administrative Rules Chapter 340, Division 41. The Environmental Protection Agency has approved the Oregon standards pursuant to the requirements of Section 303 of the Act. Therefore, the applicant's project must comply with Oregon Water Quality Standards and TMDLs to qualify for certification. The Water Quality Standards Section of this evaluation and findings report detailed the conditions considered necessary by DEQ to ensure compliance with water quality standards and TMDLs.

Section 306 of the Clean Water Act provides that new sources of pollutant discharge meet particular standards of performance for the control and reduction of pollutants being discharged. The project is not a new source since maintenance dredging has occurred for many years over the same stretch of river.

Section 307 of the Clean water Act provides that dischargers of toxic pollutants meet certain pretreatment and effluent requirements. The likelihood of contaminants within the navigation channel has been determined to be extremely low. Conditions have been developed to cover dredging outside the channel. As a result, the project complies with Section 307 of the Act.

Finding

DEQ is reasonably assured that conducting this project will comply with Sections 301, 302, 303, 304, and 306 of the Clean Water Act if the applicant meets the conditions provided for in the certification for this project.

CONCLUSIONS

This project has gone through a number of iterations, and the applicant has provided a project that has addressed many water quality issues. Those matters that are not addressed by the applicant, or that may result in water quality violations can be addressed through the implementation of best management practices, and the conditions identified herein and in the accompanying water quality certification.

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2. US Army Corps of Engineers (1998) *Appendices A-F: Draft Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel*, Portland District, October

Appendix A	Engineering Appendix
Appendix B	Columbia and Willamette River Sediment Quality
Appendix C	Economics
Appendix D	Real Estate Plan
Appendix E	HTRW Preliminary Assessment Screening
Appendix F	Salinity Intrusion Studies

3. US Army Corps of Engineers (1998) *Appendix G: Wildlife Mitigation: Draft Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel*, Portland District, October

4. US Army Corps of Engineers (1998) *Appendix H, Volume I: Columbia River Ocean Dredged Material Disposal Sites: Draft Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel*, Portland District, October

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Appendix A	Engineering Appendix
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8. US Army Corps of Engineers (1999) *Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel, Appendix G: Wildlife Mitigation,* Portland District, August

9. US Army Corps of Engineers (1999) *Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel, Appendix H, Volume I: Ocean Dredged Material Disposal Sites Main Report and Technical Exhibits,* Portland District, August

10. US Army Corps of Engineers (1999) *Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel, Appendix H, Volume II: Ocean Dredged Material Disposal Sites Coordination and Meeting Minutes,* Portland District, August

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