DEPARTMENT OF THE ARMY
RECORD OF DECISION
FOR
SEATTLE, PORT OF
(1996-4-02325)

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Concerning issuance of a Department of the Army permit under Section 404 of the Clean Water Act (33 USC §1344).

1. Introduction. This permit decision document constitutes the Record of Decision (ROD) for the work described in the public notices dated 19 December 1997, 30 September 1999, and 27 December 2000, which are hereby incorporated by reference. This ROD includes this document, the Index of Comments Received Throughout the Permit Review Process (Appendix A), the Section 404(b)(1) Evaluation (Appendix B), and the Functional Assessment, Impact, and Mitigation Plan Review (Appendix C). Section 10 of this ROD contains the comments and responses to the large number of issues raised concerning the proposed work.

My decision is to issue a permit with special conditions for the proposed work. I have determined the applicant, Port of Seattle (Port), has provided sufficient information to demonstrate a need for the proposed project, compliance with the applicable Federal laws, and that issuance of a permit is not contrary to the public interest. The Port has obtained the required Section 401 Water Quality Certification (WQC) (33 USC §1341).[1] I have added special conditions to the permit to ensure compliance with the finding of my decision (see Paragraph 12(M) below).

2. Description of Work. The Port proposes to place fill in wetlands, streams, and jurisdictional drainage channels for construction at the Seattle-Tacoma International Airport (STIA). The work proposed is part of the proposed Master Plan Update (MPU) and includes the construction of an 8,500 foot third runway, two Runway Safety Areas (RSA), the South Aviation Support Area (SASA), the mitigation both on-site and at Auburn, the relocation of South 154th/156th Way, the discharge of fill material in Borrow Area 1 and the upgrade of an existing gravel haul road (located northeast of Borrow Area 4). The construction involves permanently impacting wetlands on and off-site totaling 19.62 acres and temporarily impacting wetlands totaling 5.51 acres on-site and 23.27 acres at Auburn[2]. Up to 980 linear feet of Miller Creek will be filled and relocated. Drainage channels in the Miller Creek basin (1,290 linear feet) and in the Des Moines

[1] A discussion of the status of the WQC is found in Section 7(J).

[2] This distribution of the impact acreages between permanent and temporary are slightly different than reported in the final public notice dated 17 January 2001. See Paragraph 6 in Appendix C for details.

Creek basin (100 linear feet) will also be impacted. A breakdown of the impacts for each project component can be found in Table 1.

Table 1. Summary of on and off-site permanent and temporary impacts

	Wetlands (acres)		Stream (LF)	Drainage Channels (LF)
	Permanent	Temporary		
Third Runway[a]	15.48	4.94	980	1,390
RSA	0.14	0.40		
SASA	2.78	0.17		
Borrow Area 1 and haul road	1.10	0		
Auburn mitigation	0.12	23.27		
Total	19.62	28.78	980	1,390

[a] Includes relocation of S 154th/156th Way and temporary mitigation impacts

Work also proposed in the MPU, but not within the U.S. Army Corps of Engineers (Corps) jurisdiction includes, but is not limited to, extending Runway 34R to the south, improving and expanding the main terminal and access system, constructing a new air traffic control tower, developing new and expanding existing parking facilities, relocation, redevelopment and expansion of support facilities, and developing a new north unit terminal, roadway system, and parking facility. Several of these projects have been put on hold as a result of the events of September 11th.

3. Location. The project is located at the STIA at SeaTac, Washington, with the exception of a portion of the proposed mitigation, which is located at Auburn, Washington. The proposed 8,500 foot Third Runway is to be located parallel to and west of the two existing runways. There will be 1,000 feet separating 16X/34X and 16R/34L (the middle runway) and a 2,500-foot separation from 16L/34R (the east runway). The improvements to the RSAs are located on the north end of the two existing runways. The SASA is to be located to the southeast of the existing runways. The borrow areas are located to the south of the airport between South 196th Street and South 216th Street. The project is located in Sections 20, 21, 28, 29, 32, and 33 of Township 23N, Range 4E and Sections 4 and 5 of Township 22N, Range 4E of the Des Moines 7.5' quad.

The proposed off-site mitigation at Auburn, Washington, is located between Auburn Way North and the Green River and south of S 277th Street. The site is located in Section 31 of Township 22N, Range 5E of the Auburn 7.5' quad.

4. The Relative Extent of Public and Private Need for the Proposed Work. The Port began construction of the STIA in 1943 to relieve the overcrowding at Boeing Field, the regional commercial airport existing at that time. The Port was asked to construct the airport at the request of regional and local officials and business organizations. The airport started with four runways, the main one running north/south and the other three being crosswind runways. Changes over the next 3 decades included improvements to

the passenger terminals, improvements to the main runway to accommodate jet airplanes, and the completion of the second parallel runway in 1973. STIA has developed to become the primary commercial airport for the Pacific Northwest and is the only airport to provide primary scheduled commercial air carrier service in King, Pierce, Snohomish, and Kitsap counties.

In the mid to late 1980's, various studies completed by the Port, the Federal Aviation Administration (FAA), and the Puget Sound Regional Council (PSRC) [formally known as the Puget Sound Council of Governments], all determined the existing runways at STIA would not be adequate to meet the regional air travel needs beyond the year 2000. Based on these studies, the Puget Sound Air Transportation Committee (PSATC) was created to study possible regional options. The Port, FAA, and PSRC sponsored the PSATC. The PSATC's recommendation was to create a multiple airport system that included a new runway at STIA. In 1992, the Port passed a resolution adopting PSATC's recommendation to construct a third runway. They also state the remainder of the regional solution needs to be further examined. Another study was undertaken to determine the feasibility of a major supplemental airport. In 1994 the PSRC Executive Board determined there were no feasible sites for a major supplemental airport, no further studies should be undertaken, and provided all the permits are obtained, the third runway at STIA should be constructed.

5. Purpose of Work. The project purpose is to meet the public need for an efficient regional air transportation facility to meet anticipated future demand. The purpose is also described in the original, first, and second revised public notices and remains the existing purpose of record for this application. The Port proposes to accomplish the project purpose by implementing specific measures at STIA which are summarized as follows:

- **Third Runway.** *Improve the poor weather airfield operating capability to accommodate aircraft activity with reduced delay in aircraft takeoffs and landings.* As aircraft operations at SeaTac have increased over the years, aircraft delay, particularly during poor weather conditions, has worsened. Recent forecasts predict continued increases in aircraft operations and continued worsening of aircraft delay during poor weather conditions.[3] A third runway would allow SeaTac to operate two runways for landing during times of poor weather.

- ***Runway Safety Areas (RSAs)****. Provide RSAs that meet current Federal Aviation Administration (FAA) standards.* An RSA is the ground surface surrounding a runway suitable for reducing the risk of injury/damage in the event that an airplane undershoots, overshoots, or veers off the runway. The RSAs on the two existing runways at SeaTac do not meet current FAA standards.

[3] Recent economic conditions and the events of September 11th have affected the growth in aircraft operations and passenger activity. However, the FAA confirmed the "operational levels nationwide are expected to return to pre-September 11th levels sometime in 2003 or 2004" (see Paragraph 10(A)(9) below and Appendix B for additional discussion).

- **South Aviation Support Area (SASA)**. *Develop an additional South Aviation Support Area* (SASA) *to accommodate aircraft maintenance facilities and air cargo facilities.* Expansion of main air terminal Concourse A and development of the new North Terminal would displace existing maintenance and air cargo facilities. These terminal facilities are required to accommodate projected passenger demand.

6. Alternatives. A comprehensive discussion of alternatives available to the Port is contained in Paragraphs 3 and 4 of Appendix B (Section 404(b)(1) Evaluation) of this ROD.

Three alternatives exist for the Corps: to issue the permit as proposed by the Port, to issue the permit with special conditions, or to deny the permit. Each alternative is discussed below:

A. Permit Issuance. This is the alternative preferred by the Port. The Corps received letters indicating concern with aspects of the Port's proposal, including letters from the Muckleshoot Tribe, the U.S. Environmental Protection Agency (EPA), the National Marine Fisheries Service (NMFS), and the U.S. Fish and Wildlife Service (USFWS). The Tribal and Federal agencies requested further information and clarification regarding the project (see Paragraphs 10(B) and 10(C) below respectively). The Section 404(b)(1) Evaluation (Appendix B) concluded the Port clearly demonstrated there were no less environmentally damaging practicable alternatives available to achieve the project purpose. However, I have determined special conditions are necessary to comply and the 404(b)(1) Guidelines and for the proposed project not to be contrary to the general public interest (see Paragraph 12(M) below).

B. Permit Issuance with Special Conditions. As stated above, I have determined that special conditions are necessary for the proposed project. These are listed in Paragraph 12(M) below. With the inclusion of the special conditions, I find the alternative of permit issuance with special conditions is in compliance with the 404(b)(1) Guidelines and is not contrary to the general public interest.

C. Permit Denial. Over 500 private citizens, organizations, and business groups requested denial of the permit for reasons discussed in Paragraph 10(A)(1). I have thoroughly reviewed and analyzed the concerns presented by the interested public. I have concluded this work will not have significant adverse effect on these public interest factors. The proposed work is considered not to be contrary to the general public interest.

7. Statutory Authorities and Administrative Determinations Applicable to Proposed Project.

A. National Environmental Policy Act (NEPA). The FAA was the Federal lead for the environmental impact statement (EIS) process. A Final Environmental Impact Statement (FEIS) dated January 1996 was prepared pursuant to the Council on Environmental Quality Regulations (40 CFR Parts 1500-1508). A Final Supplemental

Environmental Impact Statement (FSEIS) dated May 1997 was also prepared. The Corps was a cooperating agency for both the FEIS and FSEIS. The FAA finalized their ROD on 3 July 1997. On 8 August 2001 the FAA issued a revised ROD to validate the data and analysis contained in the FEIS and FSEIS. The Corps is adopting the findings of the FEIS and FSEIS and has prepared this ROD in conjunction with these documents. The Corps has determined these documents are reasonable and complete and are hereby incorporated by reference. Public concerns regarding the adequacy of these documents are addressed in Paragraph 10(A)(8) below.

B. Clean Water Act – Section 404. A Clean Water Act (CWA) Section 404 permit is required for the discharge of dredged or fill material into waters of the United States, including wetlands. Landclearing and some excavation activities are also considered a discharge regulated under Section 404. The proposed project includes permanently impacting 19.62 acres of wetlands, 980 linear feet of Miller Creek, and 1,390 linear feet of drainage channels. An additional 28.78 acres of wetlands will be temporarily impacted. The Port has demonstrated the proposed project is the least environmentally damaging practicable alternative available to the Port for achieving the project purpose. Appendix B to this ROD contains the Section 404(b)(1) Evaluation.

C. Clean Air Act. The Clean Air Act (CAA) required the Environmental Protection Agency (EPA) to promulgate rules to ensure Federal actions conform to the appropriate State Implementation Plan (SIP). Conformity to a SIP is defined as meeting conformity to a SIP's purpose of eliminating or reducing the severity and number of violations of the National Ambient Air Quality Standards (NAAQS) and achieving expeditious attainment of such standards. The EPA has issued rules for determining general conformity of airport related projects (40 CFR Part 93, Subpart B). State and local air agencies are provided notification and their expertise consulted.

The FAA determined the project would meet the *de minimis* thresholds for maintenance areas as described in 40 CFR 93.153(b)(2). Therefore, an air conformity analysis was not required. However, because of the size and visibility of the project, the FAA voluntarily performed a conformity analysis as documented in the FSEIS. Their conclusion confirmed the project is below the *de minimis* levels and would conform with the applicable SIP if a conformity determination were to be required. In a letter dated 23 June 1997, the EPA determined the "*de minimis* thresholds have not been exceeded for general conformity under the CAA." The Puget Sound Air Pollution Control Agency (PSAPCA) made a similar determination on 23 June 1997, as did Washington State Department of Ecology on 20 December 1996 with a reaffirmation on 25 June 1997. Governor Gary Locke issued the State certification required under 49 U.S.C. §47101 et seq. on 30 June 1997.

The Corps has reviewed the FAA's air pollution analysis presented in the NEPA documentation, including the responses to comments, the comments made during the Corps process, and the ROD and did not find any reason to disagree with the FAA's determinations. See Paragraphs 9(T)(4) and 10(A)(10)(a) below for additional discussion.

D. National Historic Preservation Act. The National Historic Preservation Act (NHPA) requires Federal agencies to consider the effect of its actions on historic properties. Requirements of Section 106 of the Act apply to any Federal undertaking, funding, license, or permit. The Washington Office of Archaeology and Historic Preservation is consulted when projects are subject to review under Section 106 of the NHPA. The FAA is the Federal lead for the Section 106 consultation. Both listed and potential sites are located within the MPU area. On 14 April 1997, the FAA initiated consultation with the Advisory Council on Historic Preservation and the State Historic Preservation Officer regarding Sunnydale School. Consultation was completed regarding monitoring of sites potentially containing archaeological or historic material by a letter dated 24 July 2001. See Paragraph 9(D) below for additional discussion.

E. Endangered Species Act. Section 7 of the Endangered Species Act (ESA) requires Federal agencies to ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of habitat of such species which has been designated as critical. Through informal and formal consultation procedures with the U.S. Fish and Wildlife Service (USFWS) and/or National Marine Fisheries Service (NMFS) (the Services), the Federal agency must evaluate information on the presence of listed species (including timing and life stages), habitat for such species and their prey sources, and other parameters. ESA species in the project area include bald eagles, marbled murrelet, Coastal/Puget Sound bull trout, and Puget Sound chinook. Critical habitat is designated for marbled murrelet but does not exist within the project area. Chinook critical habitat was designated and present in the project area at the beginning of the consultation process. However, in May 2002 critical habitat for many of the fish runs, including Puget Sound chinook, was withdrawn by NMFS.

As the Federal lead, the FAA forwarded a copy of a Biological Assessment (BA) (Port of Seattle, 2000b) and a supplemental BA (Port of Seattle, 2000c) to the Services to complete the necessary consultation. A determination of “not likely to adversely affect” was made for all ESA species as well as critical habitat for chinook. This BA covers the regulatory actions for both the FAA and the Corps. A letter of concurrence was received from NMFS on 31 May 2001 and a biological opinion was received from USFWS on 22 May 2001. Conservation recommendations were proposed by the Services. See Paragraph 9(I)(1) for more details regarding ESA determinations and coordination.

F. Essential Fish Habitat. The Magnuson-Stevens Fisheries Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996, requires Federal agencies to consult with NMFS on activities that may adversely affect Essential Fish Habitat (EFH). EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. EFH of concern in the project area include Pacific Coast salmon (chinook, coho, and pink), Coastal Pelagic Fishery species, and West Coast groundfish.

As the Federal lead, the FAA forwarded an EFH analysis in the BA (for the pelagic and ground fish) and in a supplemental document for the salmon. This analysis covers the regulatory actions for both the FAA and the Corps. A determination of "not likely to adversely affect" was made for the pelagic and ground fish and "no adverse effect" for the coho salmon. A determination of "no effect" was made for the chinook and pink salmon. A letter of concurrence was received from NMFS on 31 May 2001 for the pelagic and ground fish and 9 August 2001 for the salmon. Conservation recommendations were not proposed by NMFS. See Paragraph 9(I)(2) below for more details regarding EFH determinations and coordination.

G. Executive Order 11988 – Floodplain Management. Executive Order (EO) 11988 on Floodplain Management was issued on 24 May 1977. The EO requires Federal agencies to avoid, to the extent possible, development in the 100-year floodplain unless it is the only practicable alternative, reduces the hazard and risk associated with floods, minimizes the impacts of floods on human safety, health, and welfare, and restores and preserves the natural and beneficial values of the floodplain. The Corps' decision as documented in this ROD complies with this EO. See Paragraph 9(K) below for more details regarding floodplain management.

H. Executive Order 12898 – Federal Actions to Address Environmental Justice in Minority and Low-Income Populations. This EO is designed to focus Federal attention on the environmental and human health conditions in minority and low-income communities with the goal of achieving environmental justice. The concept of environmental justice is based on the findings that a disproportionate number of obnoxious and/or potentially contaminating facilities/industries are located in minority communities or in low-income communities. The Department of Defense (DoD) issued a report titled *Strategy on Environmental Justice* on 24 May 1995 outlining how DoD will implement the EO. The strategy focused on promoting enforcement of all health and environmental statutes, ensuring greater public participation, improving research and data collection, and identifying differential patterns of consumption of natural resources. The Corps' decision as documented in this ROD complies with this EO. See Paragraph 9(I)(3) below for more details regarding environmental justice.

I. FAA Review. The FAA is responsible for determining project eligibility for Federal grant-in-aid funds (49 USC 47101, et. seq.), Passenger Facility Charge funds (49 USC 40117), approval for relocation/upgrade of the existing airport traffic control tower and various navigational aids (49 USC 44502(a)(1)), development of air traffic control and airspace management procedures (49 USC 40103(b)), determination regarding obstructions to navigable airspace (49 USC 40103(b) and 40113), determination regarding proposal from an airspace prospective (49 USC 40113(a)), determinations pertaining to FAA funding of airport development (49 USC 47106 and 47107), a certification that the proposed facility is reasonably necessary for use in air commerce (49 USC 44502(b)), and protection of U.S. Department of Transportation Section 4(f) resources (49 USC 330(c)). In the ROD dated 3 July 1997, the FAA determined the proposed project was in compliance with these laws. On

8 August 2001 the FAA issued a revised ROD to validate the data and analysis contained in the FEIS and FSEIS.

J. Water Quality Certification. Prior to the issuance of a Section 404 permit (33 USC §1344), the Washington State Department of Ecology (Ecology) must either issue a Section 401 WQC (33 USC §1341) stating that the Section 404 action will comply with the applicable provisions of 33 USC Sections 1311, 1312, 1316, and 1317, or waive the requirement. The State had 1-year to make this determination, in this case until 17 January 2002.[4] The Corps public notice, with the WQC notification included, is the date from which the year period runs and the Corps' public notice was dated 17 January 2001.

Ecology issued a conditional WQC on 10 August 2001. On 21 September 2001 they issued a revised WQC. Compliance with this WQC is a general condition of this permit.[5] The Airport Communities Coalition (ACC) appealed the WQC decision to the Washington State Pollution Control Hearings Board (PCHB) and the PCHB "stayed" the water quality certification on 17 December 2001. However, the WQC was not voided by a State or Federal court prior to 17 January 2002, the 1-year period from the date of WQC application. Therefore, consistent with Regulatory Guidance Letter (RGL) 87-03, the WQC is considered to be valid. If the WQC is voided or modified after the 1-year period, "the district engineer may consider if a modification, suspension, or revocation might be appropriate in accordance with 33 CFR 325.7" (see Paragraph 2(c) in RGL 87-03).[6] Though the Corps does not consider a "stay" to be the same as "voiding" and does not consider an administrative appeal equivalent to a court, if the PCHB stay were to act as "voiding" the WQC, the 1-year waiver period for the WQC has run.

The PCHB issued their Findings, Conclusions and Order on 12 August 2002. In their decision they lifted the stay previously placed and determined "Ecology's issuance of the §401 certification, with the imposition of the conditions in the §401 certification and with the conditions imposed by this Board, provide reasonable assurance that state water quality standards will be met." The Board added 16 conditions to the WQC but did not remand the WQC back to Ecology to revise the WQC. Under RGL 87-03, the District Engineer is not required to incorporate changes by the State after the 1-year waiver period. The Corps has reviewed the PCHB decision and has incorporated those conditions it believes are necessary to meet the Corps' Section 404 regulatory

[4] If the State, interstate agency, or Administrator, as the case may be, fails or refuses to act on a request for certification, within a reasonable period of time (which shall not exceed one year) after receipt of such request, the certification requirements of this subsection shall be waived with respect to such Federal application (33 USC 1341(1)(a)).

[5] Section 401(d) requires that appropriate requirements of a WQC "become a condition of any Federal license or permit subject to the provisions of this section." (33 USC 1341(d))

[6] RGLs are sequentially numbered and expire on a specified date. However, unless superseded by specific provisions of subsequently issued regulations or RGLs, the guidance provided in RGLs generally remains valid after the expiration date (*Federal Register*, Vol. 64, No. 54, Monday, March 22, 1999, Supplementary Information). RGL 87-03 has not been superseded and therefore, the guidance is still valid.

requirements. On 6 September 2002 the Port appealed the PCHB's decision to the Superior Court of King County. Ecology and ACC have also filed appeals. As of the date of this ROD, the appeals are still pending. The Corps' decision regarding the PCHB conditions does not obviate the Port's need to comply with State and local requirements.[7]

K. Coastal Zone Management Act. Pursuant to the requirements of Section 307(c)(3) of the Coastal Zone Management Act of 1972 as amended, the project must comply with the approved Washington Coastal Zone Management (CZM) Program. This concurrence is based upon compliance with all applicable enforceable policies of the CZM Program, including Section 401 of the CWA. The Washington State Department of Ecology issued the CZM Consistency Certification for this project on 10 August 2001. On 21 September 2001 they issued a revised certification.

L. National Pollutant Discharge Elimination System (NPDES) Permit. Under Section 402 of the Clean Water Act, the EPA delegated authority to Ecology for the regulation of discharges of pollutants into the State's surface waters. Ecology issued NPDES Stormwater Permit No. WA-002465 on 20 February 1998 as modified on 29 May 2001. A NPDES General Stormwater Permit for Construction Activities No. S03-00491 was issued on 4 April 2001.

M. Hydraulic Project Approval. Chapter 220-110 of the Washington Administrative Code, Hydraulic Code Rules, establishes criteria that the Washington Department of Fish and Wildlife (WDFW) has developed for the protection of fish life. These criteria are used for the review of hydraulic projects and the conditioning of Hydraulic Project Approvals (HPA). HPAs have been received for the installation of stormwater facilities and outfalls for the SR 309 Temporary Interchange, temporary water discharge for the Auburn mitigation site dewatering, the Miller Creek Basin Relocation Project (including the removal of the bulkhead at Lora Lake and the 156th Street Bridge replacement), the SR 509 Temporary Interchange, construction stormwater facilities for the Airport Surveillance Radar-9 (ASR) site, and soil sampling and installation of groundwater monitoring wells. The applications for HPAs are still pending for the Wetland A17 culvert removal and Water D routing and the in-stream mitigation work at the Des Moines Way Nursery site.

N. Forest Practices Act. Title 76 of the Revised Code of Washington (RCW) requires applicants to obtain a permit to comply with the Forest Practices Act. Before starting construction each year, the Port obtains the yearly permit for the work to be completed in the construction season and/or extensions on existing permits. At this time they have permits for the Logistics Site and a portion of the embankment area, and Borrow Areas 3 and 4.

[7] ACC in their 13 and 22 November 2002 letters state the Corps is required to incorporate all the PCHB conditions into the DA permit citing among other cases *American Rivers*, 129 F.3d at 107-111. We disagree with ACC's assessment and that our approach is consistent with Section 401, Corps guidance, and applicable case law.

O. Port of Seattle Review. The Port issues to themselves the permits for the comprehensive planning and zoning process, clearing and grading, floodplain filling, demolition and others. These permits are issued once the 100% plans are available.

8. Relevant Background of Corps Involvement. For the preparation of the EIS for the MPU at STIA, the Corps agreed to be a cooperating agency under NEPA with the FAA.[8] The draft EIS was published in April 1995 with the FEIS published in February 1996. A draft supplemental EIS was issued in February 1997 with the FSEIS issued on May 1997. The MPU is a comprehensive analysis of long-term needs for the STIA and the regional transportation network in general. A range of alternatives were addressed in the EIS, including alternative modes of transportation, construction of a new airport or modifications to an existing airport, improvements in systems management, development alternatives at STIA, and no action. After review of the alternative courses of action to address poor weather aircraft operating delay, the FAA, the PSRC, and the Port concluded the only practicable course of action to achieve the project purpose was to construct a third parallel air carrier runway and other air transportation facilities at STIA. The FAA and the Port also concluded it is necessary to construct extensions of the RSAs to bring the runways into compliance with FAA standards and it is necessary to construct the SASA. The FAA completed their ROD on 3 July 1997, with a revised ROD issued on 8 August 2001.

On 16 March 1995, the Corps received a preliminary application from the Port (1995-4-00461) to confirm the wetland boundaries within the proposed MPU expansion area. Only portions of the wetlands were actually delineated because the consultants could not gain access to the wetland areas on private property prior to acquisition by the Port. Therefore, the Corps only verified the boundaries for a portion of the wetlands. However, the Corps did agree to go to public notice with an estimate for the remaining wetlands. On 20 March 1996 a pre-application meeting was held at the Corps' office in Seattle with Federal, State, and local agencies present. In the meeting, the proposed Third Runway, SASA, and mitigation site in Auburn were discussed.

On 19 December 1996, the Corps received a more complete permit application (1996-4-02325) for the placement of fill for the construction of the third runway, RSA improvements, and SASA. On 19 December 1997 a public notice was issued and impacts were estimated to be 11.42 acres of wetlands filled and rechanneling of 980 feet of Miller Creek, 2,280 feet of drainage channels in the Miller Creek basin, and 2,200 feet of Des Moines Creek. A wetland mitigation plan was included with this

[8] There are a number of upgrades and improvements proposed as part of the MPU not requiring a Department of the Army permit under Section 404 of the Clean Water Act. These projects include, but are not limited to, extending Runway 34R to the south, improving and expanding the main terminal and access system, constructing a new air traffic control tower, developing new and expanding existing parking facilities, relocation, redevelopment and expansion of support facilities, and developing a new north unit terminal, roadway system, and parking facility. However, future phases of the work will require the placement of fill in wetlands and other waters of the United States so a permit will be required when those projects are ultimately proposed.

proposal. On 9 April 1998 a joint public hearing sponsored by the Corps and Ecology was held to gather more input from the public.

After reviewing the comments received and development of more detailed designs, the Port made some changes to the MPU projects. One major change was the Port gained access to most of the wetlands and one waterway within the proposed project area. Delineations were completed and then confirmed by the Corps. As a result, the wetlands impacts increased from the 11.42 acres to 18.33 acres, the drainage channel impacts were reduced from 4,480 linear feet to 1,390 linear feet, and the direct impact to 2,200 feet of Des Moines Creek was eliminated. The amount of fill required was also reduced because of the inclusion of a large retaining wall at the embankment mid-section along Miller Creek. As the potential impacts changed, the proposed mitigation was modified to include the addition of in-stream fisheries enhancement work in Miller Creek, increased riparian buffers, restoration of farmed wetlands, and overall expansion of the areas to be restored and/or enhanced. Another change included the excavation of new floodplain areas to compensate for filled floodplain areas. On 30 September 1999, the Corps issued a revised public notice documenting these changes. A second public hearing was then held on 3 November 1999.

Many comments were received as a result of the second public notice and public hearing. Over the next year and continuing until the permit decision was made, the Port worked with the Corps and Ecology to gather the necessary information to address the issues raised during the comment period. Because of the length of time it took to gather the information, Ecology determined they could not make a decision regarding the WQC within the required 1 year from issuance of the public notice. Therefore, on 29 September 2000, the Port withdrew their request for a Section 404 permit from the Corps. Consequently, the WQC was no longer needed.

On 27 October 2000, the Port resubmitted an application for the placement of fill for the construction of the third runway, RSA improvements, and SASA. A third public notice was issued on 27 December 2000 including an announcement for a public hearing on 26 and 27 January 2001. Revision to the proposal since the second public notice was issued included additional mitigation acreage at the Auburn site, design revisions to the in-stream work in Miller Creek, and slight modifications to the wetland impact acreage. The revisions were a result of addressing many of the issues previously raised.

Coordination with the Port and others continued throughout the decision making process to insure all of the issues raised within and after all the public comment periods expired were addressed. This included several meetings with the opposition groups, the Airport Communities Coalition (ACC) and the Regional Commission of Airport Affairs (RCAA).

9. Impact Evaluation. The Corps has evaluated both the individual and cumulative impacts of the proposed work. The evaluation considered relevant factors including, but not limited to, conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards,

floodplain values, clean air, noise, land use, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership, and, in general, the needs and welfare of the people (see 33 CFR 320.4).

A. Effect on Wetlands (33 CFR 320.4(b)).

(1) Impacts. The proposed project will permanently impact 19.62 acres and temporarily impact 28.78 acres of wetlands for the entire project, including the proposed off-site mitigation at Auburn.[9] Appendix C describes the wetlands (Enclosure A), the functions (Paragraph 5 and Enclosure B), and the impacts (Paragraph 6, Enclosure C, and Table 1) in detail. Below is a summary describing the wetlands to be impacts, the functions these wetlands perform, and the potential impacts of the proposed project.

The wetlands to be impacted by the proposed project include forested, scrub/shrub, emergent, and open water areas with several of the wetlands containing at least two different vegetation classes. In the forested areas, there are many individual trees over 60 – 80 years but the majority average 20 – 40 years of age. The emergent wetlands include some farmed wetlands and wetlands within the fairways of the golf course. Using Ecology's wetland rating system, the majority of the wetlands being permanently impacted are Category III wetlands (61%), with 23% being Category II, and 16% Category IV. None of these wetlands are unique in nature for the Puget Sound region.

The functions supported by the wetlands include water quality (sediment, nutrient, heavy metal, toxic, and organics removal), hydrology (reduction of peak flows, decreasing erosion, groundwater recharge and discharge), and general habitat suitability (fish and amphibian habitat, aquatic food web conditions, invertebrate habitat, terrestrial bird, waterfowl, and other wildlife habitat, and native species richness). For water quality, the Corps has determined the majority of the wetlands are rated high given the existing land uses, the landscape position of the wetlands, and the limited number of water quality treatment ponds within the area. The Corps has determined there is a range of ratings for the hydrology functions. The depressional wetlands provide reduction of storm peak flows at relatively high levels and prevent downstream erosion in the area streams. The slope wetlands perform this suite of functions at a low level. The small wetlands perform them at an even lower level given the limited opportunity and capacity for storage. As for habitat functions, the Corps has determined the on-site wetlands, in general, rate highest for carbon export and food chain support and to a lesser extent invertebrate, passerine bird, small mammal, and amphibian habitat. The Auburn wetlands rate as low overall for habitat support.

[9] The PCHB and Ecology have the permanent impacts as 21.34 acres and the temporary as 2.05 acres. The PCHB/Ecology permanent impacts include 0.92 of an acre of prior converted croplands not regulated by the Corps. The Corps considered part of the 2.05 acres of temporary impacts as permanent (see Table 2 of Appendix C). As shown in Table 1 above, the Corps also included temporary impacts associated with the construction of the mitigation, 4.71 acres on-site and 23.27 acres off-site which the PCHB/Ecology did not include.

The Corps analyzed permanent, temporary, temporal, indirect, and cumulative impacts as a result of the proposed projects. A discussion of cumulative impacts can be found in Paragraph 9(S) below. As stated above, there will be 19.62 acres of permanent impacts and 28.78 acres of temporary impacts. Regarding water quality, potential permanent impacts include decreased opportunity for nutrient and sediment trapping, decreased opportunity to detain, retain, and filter stormwater, and increased pollutant and sediment loads to streams. Temporary impacts could occur during construction as a result of soil movement and disturbance. Temporal impacts will occur until the vegetation communities become reestablished and are able to perform their water quality functions. Indirect impacts could include a shift in food chain support due to any changes in water quality. Additional discussion regarding water quality can be found in Paragraph 9(C) below.

The proposed project will permanently change the pathways for water movement within the project area. Other potential long-term impacts include an increased magnitude, frequency, and duration in peak flow, increased erosion and sedimentation, and base and low flow impacts. Temporal impact will occur until the vegetation communities mature and stabilize so they can perform storm and floodwater resynchronization functions. Potential indirect impacts include changes to the vegetation community and wildlife use of the wetlands or habitat damage to streams either through erosion or reducing wetted areas if the hydroperiods are substantially changed.

There will be a permanent loss of habitat in the areas being filled by the proposed project. This loss could alter or eliminate populations in the lower trophic levels, reduce the volume of organic particulate matter, eliminate or reduce wildlife migration corridors, etc. Temporary impacts could include disruption to wildlife utilizing adjacent areas and trimming of vegetation in shrub and forested wetlands for silt fence installation. Temporal impacts occurring include the reduction of habitat and carbon export until the vegetation is reestablished in the newly planted areas. Indirect impacts include the potential shift in food chain support functions.

(2) Mitigation. The Port has proposed mitigation to offset the potential physical, chemical, and biological impacts to wetlands and the species supported by the wetlands, as documented in the *Natural Resource Mitigation Plan* (NRMP) (Port of Seattle, 2001d),[10] *Comprehensive Stormwater Management Plan* (Port of Seattle, 2000d), *Low Streamflow Analysis* (Port of Seattle, 2001a), and the *Wildlife Hazard Management Plan* (WHMP) (Port of Seattle, 2000e). A more detailed discussion of the compensatory mitigation can be found in Paragraph 10(A)(5) below and Appendix C. Additional discussion regarding stormwater and low flow can be found in Paragraphs 9(C) and 10(A)(6)(a) and (b) below. Discussion about wildlife concerns can be found in Paragraphs 9(B) and 10(A)(10)(g) below.

[10] The NRMP referenced throughout the ROD and Appendix B is the November 2001 version with corrections dated January 2002 and February 2002 (miscellaneous text and figures) and 15 November 2002 (revised restrictive covenants). Appendix C includes a review of both the December 2000 and November 2001, as amended, versions.

In summary, the NRMP describes the compensatory mitigation voluntarily proposed by the Port to replace wetland and stream functions impacted by the proposal. The proposed mitigation includes wetland creation, restoration, and enhancement activities, stream enhancement in Miller Creek, riparian buffer enhancement in Miller and Des Moines creeks, replacement of drainage channels in the Miller Creek basin, and wetland restoration and enhancement at an off-site mitigation area in Auburn. Appendix C describes the adequacy of the NRMP in Paragraphs 7 through 10. The *Stormwater Management Plan* addresses water quality and quantity impacts through the construction of detention ponds and vaults, implementation of treatment best management practices (BMPs) for new development, redevelopment, and retrofitted areas, and numerous actions to address water quality issues. The *Low Streamflow Analysis* addresses the potential low flow impacts through the construction of supplemental vaults so water can be released during the summer and early fall months to augment streamflow. The WHMP emphasizes the identification and abatement of wildlife hazards within the airfield environment, including the wetlands.

The PCHB also had concerns regarding the proposed wetland mitigation and 3 of the 16 conditions they added were regarding wetland mitigation.[11] A discussion of each of these conditions is as follows.

Condition 10. The performance standard for wetlands is modified so that the Port matches the hydroperiods of the wetlands pre- and post project, in order to assure the long-term maintenance and perpetuation of wetland characteristics, such as standing or flowing water, wetland resources, and wetland functions. In Condition D, the WQC requires the Port to complete the mitigation and monitoring as stated in the NRMP and with a more specific condition requiring "groundwater within the upper 10 inches from at least March to mid-April in years of normal rainfall." The PCHB was also concerned over maintaining the same, pre-construction, amount of wetland hydrology during the driest months (August through October) of the year. Therefore, they added this condition requiring the pre and post construction hydroperiods of the wetlands to match. This condition would help to ensure the wetland characteristics such as standing or flowing water, wetland resources, and wetland functions are maintained in the remaining wetlands.

Condition 11. The Port shall mitigate for on-site wetland loss at the ratio of no less than 2:1. This ratio shall not include wetland buffers or preserving wetlands that are already protected. In order to meet this ratio, the Port is urged to consider enhancing the Walker Creek headwaters wetlands. The WQC approved the proposed mitigation that included, but is not limited to, credit for off-site mitigation at Auburn, wetland and riparian buffer enhancement, and wetland and buffer preservation. Ecology used their own guidance and factored in both functions and acreage in determining the

[11] The Port is appealing Condition 11. If their appeal changes the PCHB decision, then the DE has the option of modifying, suspending, or revoking the DA permit to comply with the revised decision (see Paragraph 7(J) above).

appropriate ratios for the mitigation for the WQC. The PCHB believed credits should not be granted for the wetland and upland buffers and the wetland and upland preservation because they cannot substitute replacement of actual wetland losses. They stated, "wetland impacts must be mitigated with restored, enhanced or created wetlands, not with buffers."[12] The PCHB is also requiring credit for the off-site mitigation not be given until on-site mitigation efforts reach a 2:1 ratio or opportunities are exhausted. This will encourage the Port to examine previously overlooked in-basin mitigation opportunities.

The Port is appealing this decision because on-site mitigation opportunities are limited because of FAA safety regulations and state statute allows off-site mitigation. They also believe the PCHB should have allowed credit to be given for the wetland and upland buffers and the wetland and buffer preservation efforts. ACC is not challenging the condition but does not agree with allowing out-of-basin mitigation, counting Vacca farms as restoration, accepting the Port's functional assessment, and the statement that the proposed mitigation would be beneficial in removing pollutants.

Condition 12. Condition (D)(1)(h) is modified so that if the future wetland delineations show the wetland boundaries have decreased, additional in-basin mitigation shall be required. The wording of Condition (D)(1)(h) in the WQC requires wetland delineations be performed at intervals of 5, 10, and 15 years. If the delineations show the boundaries have decreased, additional mitigation may be required. The PCHB condition changes the 'may' to 'shall'.

(3) Findings. The Port has voluntarily proposed mitigation to offset the potential impacts to wetlands and the ecosystems supported by the wetlands. I have evaluated the proposed project and the proposed NRMP, *Stormwater Management Plan*, *Low Streamflow Analysis*, and WHMP and have determined they will result in the creation, restoration, and enhancement of wetlands in a rough proportionality to the project impact, considering both the nature of and the extent of the impact. The proposed plans are reasonable, and have been specifically designed for this project site to compensate for the loss of wetlands on this project site occurring due to construction of the proposed project. I have also determined it is in the public interest to require the completion of mitigation as a special condition of the issued Department of the Army permit (see Paragraph 10(A)(5) below for additional discussion).

Regarding PCHB Condition 10 (Wetland hydroperiod), maintaining the wetland hydroperiod is an important component in ensuring the remaining wetlands are not adversely impacted. However, assessing the hydroperiod for wetlands is just one factor in determining the overall function of a wetland. I have completed an independent analysis of the adequacy of the mitigation, including the performance standards and monitoring related to hydrologic conditions, to ensure the overall function of the wetlands are maintained. Appendix C documents this analysis and includes the Corps'

[12] PCHB 01-160. Final Findings of Fact and Conclusions of Law, page 80, lines 2-3.

functional assessment. The Port has also provided more detailed protocols regarding groundwater monitoring (Port of Seattle, 2002) and I have added a special condition to ensure these protocols are implemented (see Paragraphs 10(A)(10)(h) and 12(M) below). I have determined the proposed mitigation plan is reasonable and specifically designed for this project site to functionally compensate for the loss of wetlands. This condition has not been added to the permit.

Regarding PCHB Condition 11(Mitigation ratios and credits), I have completed an independent analysis of the adequacy of the mitigation and have determined the proposed mitigation plan is reasonable and specifically designed for this project site to compensate for the loss of wetlands. The Corps does not require applicants to follow any particular functional assessment methodology. Therefore, in making this determination, I relied on a Corps completed functional assessment (see Appendix C for details). I also based my decision on functional replacement rather than acreage to meet the program goal of no net loss of functions and values. Regarding the use of functional replacement rather than acreage, the 1990 Memorandum of Agreement between the Corps and EPA concerning mitigation states:

> The objective of mitigation for unavoidable impacts is to offset environmental losses. Additionally for wetlands, such mitigation should provide, at a minimum, one for one functional replacement (i.e., no net loss of values), with an adequate margin of safety to reflect the expected degree of success associated with the mitigation plan, recognizing that this minimum requirement may not be appropriate and practicable, and thus may not be relevant in all cases, as discussed in Section II.B of this MOA. In the absence of more definitive information on the functions and values of specific wetlands sites, a minimum of 1 to 1 acreage replacement may be used as a reasonable surrogate for no net loss of functions and values. (Corps, 1990, Part III.B., page 5)

As the Port did provide detailed information regarding functions and I performed an independent functional assessment, a determination of the adequacy of the mitigation on a functional basis is appropriate. As documented in Appendix C, I gave partial credit for both the wetland and upland buffers and the work in and around Lora Lake as they do contribute to the overall functionality of the proposed mitigation. I also gave credit for restoring the wetlands at Vacca Farms.[13] I also factored in the avoidance of wetlands and buffer impacts in Borrow Area 3 in my impact evaluation. I also examined several potential on-site alternatives for mitigation and the Port did subsequently augment the NRMP by including additional mitigation around Lora Lake and at the Des Moines Nursery. The primary impact to Walker Creek, potential low flow impacts, have been mitigated with the proposed low flow mitigation (See Paragraph 9(C) below). I

[13] As discussed on page 82 of the PCHB decision, "[t]here is no hard line distinguishing restoration from enhancement." The Corps considered the work restoration only because most of the Vacca Farm area is not a jurisdictional wetland. As the adequacy of the mitigation was made on a functional basis and the proposed mitigation at Vacca Farms is increasing the functions (however, degraded and/or missing), using either the term restoration or enhancement is immaterial.

have determined the final mitigation plan proposed by the Port is adequate to compensate for the impacts of the project on the aquatic environment. Based on this information, this PCHB condition has not been added to the permit. Additional discussion regarding mitigation can be found in Paragraph 10(A)(5) below.

Regarding PCHB Condition 12 (Wetland redelineation), I have completed an independent analysis of the adequacy of the mitigation, including review of potential impacts to the areal extent of the remaining wetlands. I have determined the proposed mitigation plan is reasonable and specifically designed for this project site to compensate for the loss of wetlands. I have added two special conditions requiring redelineation of the remaining wetlands and additional monitoring requirements to assess unforeseen indirect impacts (see Paragraphs 10(A)(5), (10)(A)(10)(h), and 12(M) below). If adverse changes do occur, I have the option of modifying, suspending or revoking the permit. The NRMP also allows adaptive management to be used to assess the cause(s) and remedy the situation. I believe a variety of options need to remain available especially if the cause for adverse changes are outside of the Port's control. Therefore, this PCHB condition has not been added to the permit.

B. Fish and Wildlife (33 CFR 320.4(c)).

(1) Impacts. Regarding impacts to fish, the proposed project will directly impact 980 linear feet of Miller Creek being realigned at the north end of the project to allow construction of the runway. Temporary impacts to fish and fish habitat could occur during construction as a result of soil disturbance and movement and the proposed creek enhancement mitigation. As a result of these projects there could be increased sediment laden runoff, increased turbidity in the creeks, changes to peak, base, and low flows, and other impacts to water quality. Temporal impacts include the time it will take for the realigned and enhanced portions of Miller Creek to equilibrate to the new configuration, habitat components, and hydrological pathways resulting from the construction and operation of the facility. Indirect impacts could include changes to the food chain support system including reduction or changes to species richness and changes to organic carbon support.

Regarding impacts to wildlife, the proposed project will alter approximately 480 acres of existing wildlife habitat in Miller, Walker, and Des Moines creeks for the runway, borrow area, and SASA portions of the projects. Existing forested, scrub/shrub, emergent, and open water areas will be changed to buildings, paved areas, managed pasture areas, or in the case of the borrow areas, monotypic vegetation communities. These changes will eliminate some wildlife habitat causing the species currently using these areas to relocate. If the surrounding areas are already at capacity, there may be some reduction in population numbers. Operation of the airport will also directly impact the wildlife because active steps are taken to minimize wildlife use in the areas surrounding the runways to minimize collisions between wildlife and airplanes. There will be temporary impacts as a result of the noise from construction. Temporal impacts will occur until the vegetation planted as a part of the proposed mitigation matures and begins providing

the same quality of habitat as that being impacted. Indirect impacts to wildlife could include changes to food sources and changes in available habitat types.

(2) Mitigation. As described in Paragraph 9(A)(2) above, the Port has proposed mitigation to offset the potential impacts resulting from the construction of the proposed projects. The plans described above include proposed mitigation to compensate for impacts to fish and wildlife. A component of all the on-site wetland mitigation is designed to help compensate for the non-avian habitat wildlife impacts and the stream and buffer components are designed to compensate for the fisheries impacts. Regarding avian habitat, the proposed off-site mitigation at Auburn was designed to compensate for the on-site loss of this habitat in conformance with FAA Advisory Circular No. 1505200-33.

The PCHB added several conditions regarding water quality that will also be protective of fish and wildlife. See Paragraph 9(C) below for discussion regarding these conditions.

(3) Findings. The Port has voluntarily proposed mitigation to offset the potential impacts to fish and wildlife. I have evaluated the proposed project and the proposed NRMP, *Stormwater Management Plan*, *Low Streamflow Analysis*, and WHMP and have determined they will result in the creation, restoration, and enhancement of wetlands and the enhancement of streams and riparian areas in a rough proportionality to the project impact, considering both the nature of and the extent of the impact. The proposed plans are reasonable, and have been specifically designed for this project site to compensate for the loss of wildlife habitat and impacts to fish habitat on this project site occurring due to construction of the proposed project. I have also determined it is in the public interest to require the completion of mitigation as a special condition of the issued Department of the Army permit (see Paragraph 10(A)(5) below for details).

C. Water Quality (33 CFR 320.4(d)).

(1) Impacts. Impacts to water quality could occur during construction, as a result of the construction, or from operation of the proposed facilities. During construction, the primary impacts are related to short-term increases in total suspended solids from erosion and sedimentation as a result of all the earth moving activities. A range of pollutants used during construction, e.g. fuels, lubricants, and other petroleum product, could be spilled or leak from the construction equipment. In either of these situations, these pollutants could reach wetlands and/or the creeks unless mitigated effectively. These impacts could occur both at the airport and at the proposed borrow source areas.

The potential water quality impacts from the operation of the facilities are primarily related to the additional impervious surface area and related stormwater runoff occurring at the airport. The proposed projects will increase the amount of impervious surface in Miller, Walker, and Des Moines creeks approximately 11%, 5%, and 12% respectively. The stormwater from these paved areas could contain pollutants including

metals, fuels and other petroleum based products, glycols or runway anti-icers, organics, etc.

Pollutants in the stormwater runoff could also impact the water quality of the water being stored in the supplemental vaults. These vaults will detain excess stormwater runoff during the winter and will be released to the streams during the predicted low-streamflow periods.

Additional discussion regarding the potential impacts to the various aspects of water quality can be found in Paragraph 10(A)(6) and 10(A)(10) below, Paragraph 5 of Appendix B, and Appendix C.

(2) Mitigation. A Stormwater Pollution Prevention Plan is required by the NPDES Permit and includes BMPs for temporary erosion and sediment control, construction stormwater monitoring, and hazardous materials management. The BMPs include installation of construction stormwater treatment systems, temporary cover practices (e.g. mulching), sediment retention (e.g. silt fences, sediment basins), permanent cover practices, structural erosion control BMPs (e.g. check dams), dust control (e.g. wheel wash systems), phasing of construction activities, designing terraces to reduce sheet and rill erosion, etc. The actual amount of sediment reaching the creeks is expected to be reduced through the use of stormwater management facilities like wet vaults, wet ponds, and biofiltration swales. In some locations, the floodplain mitigation area and the subgrade improvement areas in particular, dewatering will be required before excavation occurs. Water from these areas will be directed towards sediment settling ponds prior to release back into the system. Flows to the new channel of Miller Creek will be slowly introduced to allow the streambed gravels to sort and stabilize. A collection sump at the downstream end will collect any turbid water and convey the water to the settling ponds.

Regarding fill material criteria, both Ecology and USFWS have performed extensive reviews of the standards for protection of aquatic resources. The Port will be required by both Ecology and USFWS to use an "ultra-clean" drainage layer cover[14] as the base layer, 40-feet thick along the western edge. The Port will monitor the seepage from the drainage layer for 10 years for potential water quality impacts as required by both Ecology and USFWS.

The Port has prepared a *Stormwater Management Plan* (SMP) dated December 2000 with replacement pages dated July 2001 to address stormwater concerns during operation of the facilities. The SMP was prepared in cooperation with Ecology and King County, supporting Ecology. Additional discussion regarding stormwater issues can be found in Paragraph 10(A)(6)(a) below.

[14] Ultra clean is defined on page 41 of the USFWS BO as not exceeding "the back-calculated values in the second column of Table 9".

Ecology issued a revised WQC on 21 September 2001 certifying the proposed projects comply with the applicable provisions of the CWA. Ecology placed numerous conditions on the WQC to ensure the Port completes the necessary work to comply with this certification. The subjects of the conditions include water quality criteria, instream/shoreline work monitoring plans, notification and reporting requirements, wetland, stream, and riparian mitigation, soil fill acceptance criteria, prevention of contaminant transport, upland construction activities, low flow impacts, operational and construction stormwater requirements, etc. The Port also has an NPDES permit issued by Ecology for stormwater for the operation of the facility and construction of the SR 509 interchange.

To analyze the potential impacts to low flow, the Port prepared a separate analysis titled *Low Streamflow Analysis and Summer Low Flow Impact Offset Facility Proposal* dated December 2001. This report looked at the potential impacts to summer low flows in Miller, Walker, and Des Moines creeks as a result of the proposed third runway embankment fill and the proposed excavation at the three borrow areas. The study found a flow offset of 0.11 cubic feet per second (cfs) was needed in Walker Creek, 0.08 cfs in Des Moines Creek, and that no offset was needed in Miller Creek. The Port concluded supplemental stormwater vaults of 19.0 acre-feet and 13.5 acre-feet were needed in Walker and Des Moines creeks respectively. The Port's NPDES permit issued by Ecology sets the required water quality standards for the water in the supplemental vaults.

The PCHB also had concerns regarding water quality and 13 of the 16 conditions they added were regarding water quality issues.[15] A discussion of each of these conditions is as follows.

Condition 1. BMPs shall be selected from the enhanced treatment list for better removal of dissolved metals. In developing its Stormwater Manual for Western Washington, Ecology has found the basic treatment list of BMPs is not sufficient for treating dissolved metals in stormwater discharges from industrial and commercial lands. For example, filter strips and biofiltration swales have not been found to be effective in removing dissolved metals from stormwater. Therefore, they have created a list of enhanced treatment BMPs which include large sand filters, amended sand filters, or stormwater treatment wetlands used in combination with biofiltration swales in "two facility treatment trains" to better remove dissolved metals. Through studies at the airport, Ecology has determined copper concentrations may be higher than the criteria in the water quality standards in the stormwater originating from the airport. As required by their NPDES permit, the Port annually reviews the Stormwater Pollution Prevention Plan (SWPPP) and, as appropriate, identifies and selects new BMPs. However, the WQC does not require the Port to choose BMPs from the enhanced treatment list. The

[15] The Port is appealing Conditions 3, 5, 6, 7, 8, 13, and 16 and Ecology is appealing Conditions 5, 7, and 8. If any appeal of the conditions changes the PCHB decision, then the DE has the option of modifying, suspending, or revoking the DA permit to comply with the revised decision (see Paragraph 7(J) above).

PCHB agreed additional BMPs beyond just biofiltration swales are needed for better removal of dissolved metals. Therefore, the PCHB required the BMPs be selected from the enhanced treatment list.

Condition 2. The Port shall sample of stormwater above and below stormwater outfalls and a monitor the hardness of the receiving waters. The Washington Administrative Code (WACs) require hardness data and the sampling to be conducted in receiving waters, not upstream of those receiving waters. Hardness sampling is important because water quality standards for metals are hardness dependent. Sampling in the receiving waters both above and below the Port's discharge points shows whether the Port's discharges have changed the water quality in the receiving waters. At this time, the Port's NPDES does not currently require this. The Port measures their water quality in their pipes to make sure they are sampling water that only the Port can affect the water quality. Because of the age of the stormwater facilities surrounding the airport, it has been difficult to sample in the receiving waters at locations where only the Port's activities would affect the water quality. The PCHB found the Port's lack of hardness data and the poor location of the sampling "to result in, at best, confusing and, at worst, inaccurate data." Therefore, the PCHB required sampling both above and below the outfalls and monitoring of hardness.

Condition 3. Water quality testing for toxicity to sensitive organisms, by the Port and approved by Ecology, shall measure injury, as well as mortality of those organisms. The NPDES permit requires whole effluent toxicity (WET) testing to determine the aggregate toxicity of the whole effluent samples to certain sensitive marine organisms. This testing is usually for mortality and not impairment. The PCHB believed that testing just for mortality does not assess the longer-term chronic injury to the aquatic species. Therefore, the PCHB condition requires the toxicity testing to include not only mortality but also impairment and loss of function of the tested organism. The Port is appealing this decision because they believe it is vague and ambiguous and is seeking clarification as to what specific tests the PCHB would require. The WET testing currently performed by the Port is not typically used to assess chronic injuries. Other protocols and thresholds need to be selected for testing impairment instead of mortality.

Condition 4. 100% of the stormwater management facility retrofit shall be completed by the time 50% of the impervious surfaces have been constructed. Condition J of the WQC requires 20% of the retrofitting to be accomplished for every 10% of new impervious surface added to the permit. This calculates out to be 100% retrofitting completed after 50% of the impervious surface is added. However, the 20% rate can be reduced if the Port can demonstrate they cannot feasibly meet this standard. The PCHB did not believe the rate should be able to be reduced so their condition makes 100% of the retrofitting be completed by the time 50% of the impervious surface is added as an absolute.

Condition 5. Use of the WER study is limited so that the study results shall only be used if the data suggests the water quality criterion should be lowered. The WQC requires a water effects ratio (WER) study be completed prior to discharging any

stormwater from the new impervious surfaces. A WER study determines how metals in stormwater discharges would behave in receiving waters in terms of toxicity to aquatic species. A ratio between a metal's toxicity in actual site water and its toxicity in laboratory water is determined. This ratio is then used to adjust the water quality criteria for site-specific conditions. Initial WER studies for copper indicate the water criteria could be made less stringent. Because of the sampling concerns raised in, and resolved by, Condition 2 above, the PCHB believed the study results should only be used to make the criteria more stringent.

The Port and Ecology are appealing this condition because both Ecology and EPA have recognized water quality criteria determined in a laboratory setting are often more restrictive than needed based on site-specific conditions. Both Ecology's regulations at WAC 173-201A-040(3)(dd) and EPA's regulations at 40 CFR 122.44(d)(1)(vi)(A) referencing their Water Quality Standards Handbook (Second Edition, Appendix L) allows the WER study results to establish effluent limits, either more or less stringent. Ecology further believes the PCHB does not have the authority to change regulations needing to go through a public review process.

Condition 6. The level of mitigation flows for Des Moines Creeks is 1 CFS, below which mitigation is required. In the *Draft Des Moines Creek Flow Augmentation Plan* dated 18 August 1998, the Port proposed flow augmentation of Des Moines Creek as required by Ecology. In this report, the Port proposed to pump well water to Des Moines Creek when the streamflow rate immediately below the confluence of the east and west branches of Des Moines Creek drops below 1 cfs. The flow depths would be monitored so a 1 cfs minimum flow rate would be maintained. Augmentation would occur between May and October. The PCHB used this report to determine the threshold flow below which mitigation is required should be 1 cubic feet per second (cfs). Subsequent to the 1998 report, the Port performed a more detailed and specific analysis of the existing summer low stream flows in Miller, Walker, and Des Moines creeks. In the *Low Streamflow Analysis* report, the Port determined the existing summer low stream flows (7-day, 2-year frequency) in Des Moines Creek is 0.33 cfs. They then determined with the project the low stream flows would be reduced by 0.08 cfs. Therefore, they proposed to mitigate by providing 0.08 cfs. This analysis is what was used by Ecology for the WQC. The PCHB chose to use the results of the earlier study and required the threshold level for mitigation to be 1 cfs.

The Port is appealing this condition because they believe it is ambiguous. The PCHB approved the low flow modeling which showed the mean annual low flow for Des Moines Creek was 0.33 cfs with the impact being 0.08 cfs. However, with no supporting evidence in the record, the PCHB chose 1 cfs as the level of mitigation flows. The Port believes requiring mitigation beyond the project impacts exceeds the PCHB's authority and is arbitrary and capricious.

Condition 7. The fill criteria are modified as follows:

Antimony	5.79 mg/kg
Arsenic	7 mg/kg
Barium	12,000 mg/kg
Beryllium	.6 mg/kg
Cadmium	1 mg/kg
Chromium	42 mg/kg
Copper	36 mg/kg
Lead	24 mg/kg
Mercury	.07 mg/kg
Nickel	48 mg/kg
Selenium	.52 mg/kg
Silver	.28 mg/kg
Thallium	2 mg/kg
Zinc	85 mg/kg
TPH	0

Ecology initially set the fill criteria using a combination of the Model Toxics Control Act (MTCA) Method A Soil Cleanup Levels for unrestricted land use, back calculations, Puget Sound background levels, and Practical Quantitation Limits (PQL). The ESA consultation further refined the criteria for the metals of concern under the Resource, Conservation and Recovery Act. The PCHB did not believe the correct standards were developed so they revised the criteria. Their rationale was apparently based on some of the limits being higher than background levels, misinterpretation by Ecology of the 1993 Ecology implementation memo, other test methods available with lower PQLs, etc.

Both Ecology and the Port are appealing this condition. Ecology is appealing because they believe the PCHB "exceeded its authority, acted arbitrarily and capriciously, and erroneously interpreted or applied the law." The Port believes the PCHB levels are lower than "natural background" levels and/or lower than levels that laboratories can reliably measure for some constituents. Also, the Port believes their sensitivity analysis shows there is "virtually no risk that fill containing much greater levels of the constituents included in the fill criteria would leach at levels sufficient to violate applicable surface water quality criteria." The ACC is not challenging the condition but believes it should be applied to the fill already in place.

Condition 8. The SPLP process may not be used to authorize the importation of fill that exceeds the modified fill criteria. The Synthetic Precipitation Leaching Procedure (SPLP) tests whether a particular contaminant in the fill material will leach at rates with the potential to threaten water quality. The USFWS, and later Ecology in the 21 September 2001 WQC, allowed the Port to use this testing procedure for fill exceeding any of the fill criteria. If the SPLP test confirms leaching of the contaminant will not affect water quality, fill in excess of the criteria could be used. The PCHB was concerned with the effectiveness of the SPLP process in determining compliance with

water quality standards for metals. Therefore, they do not allow the use of the SPLP process.

Both Ecology and the Port are appealing this condition. They both believe the SPLP test is a recognized testing protocol and is authorized for use by both state, WAC 173-340-747(2)(a) and (7)(b), and Federal, 40 CFR Part 261 Appendix II and EPA Publication SW-846, regulations. Ecology further believes the PCHB does not have the authority to change regulations needing to go through a public review process.

Condition 9. The minimum number of samples of the proposed fill shall be increased to reflect the number of samples required under MTCA. The WQC requires 6 samples from a fill source greater than 100,000 cubic yards. During testimony, Ecology's toxics cleanup program senior engineer, Mr. Peter Kmet, recommended a larger number of samplings. Therefore, the PCHB added the proposed condition.

Condition 13. The language in the monitoring requirement of Condition E(3) is modified so that in the event monitoring detects exceedances of the water quality criteria in either surface or groundwater, Ecology shall take action to eliminate the exceedances. This may include a revision to the fill criteria and/or corrective action. This condition requires post construction monitoring of runoff, seepage, and down-gradient groundwater for compliance with surface water and groundwater criteria. In the event exceedances are detected, the WQC stated Ecology **may** revise the fill criteria and/or require corrective action. The PCHB believed there must be more certainty in the outcome. Therefore, they stated Ecology **shall** take action.

The Port is appealing this condition because the "directive usurps Ecology's discretion to decide whether action on its part is necessary or appropriate."

Condition 14. The monitoring duration in Condition B (and its cross references to E(3) and F(1)) shall continue for at least 8 years from the conclusion of construction and, should monitoring reveal exceedances, Ecology shall further extend the period of monitoring. The WQC condition requires the surface and ground water monitoring to be performed as specified for no less than eight years. The PCHB believed the monitoring could be discontinued before the embankment ever reaches equilibrium regarding discharges. Therefore, they clarified that the monitoring shall continue for eight years and beyond, if exceedances are found.

Condition 15. The monitoring in Condition F(1) is modified so that monitoring continues for as long as there are contaminants in the AOMA. This condition requires monitoring of any potential transport of contaminants along proposed utility lines at the Airport Operations and Maintenance Area (AOMA) or other potentially contaminated sites at the airport. The WQC does not specify, and Ecology did not intend there to be, any time limitations for this monitoring. The PCHB clearly specifies monitoring will continue as long as there are contaminants present.

Condition 16. The Port shall obtain a water right to use water as proposed mitigation under the Low Flow Plan. The proposed source of water for low flow mitigation is in low-flow vaults associated with the stormwater vaults. The Port will capture and detain water and release at a rate and time as specified in the *Low Streamflow Analysis.* The PCHB determined a non-consumptive water right needs to be obtained because "the diversion and impoundment system combined with the subsequent application of water to a beneficial use takes the Port's plan beyond simple 'management' of stormwater to an appropriation triggering water code requirements."[16]

The Port is appealing this condition because they believe it is "an erroneous interpretation or application of law." ACC is not challenging the condition but does not agree with the timing of when the water right should be obtained and that additional SEPA analysis is required before a water right can be issued.

(3) Findings. Responsibility for control of non-point sources of pollution has been delegated to Ecology in the State of Washington. Certification of compliance with applicable effluent limitations and water quality standards required under provisions of Section 401 of the CWA will be considered conclusive with respect to water quality considerations unless the Regional Administrator of EPA advises of other water quality aspects to be taken into consideration (see Paragraph 10(C)(1) below).

Regarding Condition 1 (Enhanced BMPs list), dissolved metal concentrations in stormwater discharge higher than allowed in the water quality standards could be detrimental to the aquatic species present downstream of the stormwater discharge points. This condition requires BMPs to be used that are better at removing metals than are currently employed. This would be beneficial to the aquatic species. This condition has been added to the permit.

Regarding Condition 2 (Stormwater sampling), sampling in the receiving waters both above and below the point of the Port's discharge into the creeks will allow a better characterization of the Port contribution to any in-stream water quality problems. Sampling in the pipes before discharge does not take into account possible impacts from the mixing of the two water sources. Actual locations will need to be worked out and will be in the new NPDES currently being processed. Including hardness data is necessary to determine compliance regarding metals. Performing sampling in this manner would help ensure water quality standards are met and would therefore, be beneficial for protection of the aquatic environment. This condition has been added to the permit.

Regarding Condition 3 (WET testing), EPA has established protocols, Method Guidance and Recommendations for WET (40 CFR 136), for both acute and chronic testing with various endpoints. Testing for impairment, typically growth and/or

[16] PCHB 01-160. Final Findings of Fact and Conclusions of Law, page 122, lines 2-4.

reproduction, as well as mortality would help to ensure the stormwater discharges do not chronically impact aquatic species. This condition has been added to the permit.

Regarding Condition 4 (Stormwater retrofitting schedule), ensuring the completion of retrofitting of the stormwater management facilities at the airport to current standards would help to ensure water quality is improved and is therefore, beneficial for aquatic species. This condition has been added to the permit.

Regarding Condition 5 (use of WER studies), both Ecology and EPA regulations allow WER studies to be used to either raise or lower the water quality criteria. I believe this allows site-specific water quality criteria to be developed while still being protective of the aquatic species. Therefore, PCHB this condition will not be added to the permit.

Regarding Condition 6 (1 cfs level of mitigation flow in Des Moines Creek), I agree reducing the amount of water in the creeks below the current levels could impact both water quality and the aquatic species present in all the creeks. I have determined the Port's analysis and proposed mitigation is adequate for protection of the low stream flows, water quality, wetlands, and the aquatic environment. The Corps reviewed the *Low Streamflow Analysis* as documented in the memoranda titled *Review of Hydrologic Quantity Modeling* (Corps, 2 August 2002), *Hydrogeological Review – Borrow Areas* (Corps, 11 August 2002), *Hydrogeological Review – MSE Walls and Fill Embankment* (Corps, 15 August 2002). In summary, the Corps had questions regarding the simulation periods used and the calibration of the models in Miller and Walker creeks, the equilibration time for the embankment soils, and designing the mitigation to account for the uncertainty in the modeling. The Port responded to these concerns in their letter dated 13 September 2002 (Port of Seattle, 2002). The PCHB also determined "no single model could have accurately and effectively simulated hydrologic conditions in a project of this complexity, and the date reflecting the Port's comparison of pre- and post-construction conditions was accurate within a reasonable margin of error."[17] After reviewing the Port's response and additional information subsequently provided by ACC and the PCHB discussion, the Corps is satisfied that the proposed mitigation is adequate. Therefore, this PCHB condition will not be added to the permit. However, both the streamflow mitigation and wetlands must be monitored to assure that proper recharge is maintained during and after development of the embankment fill areas. The wetland hydrology is being monitored as part of the NRMP with the additional protocols required by special condition. A special condition will be added requiring the low flow mitigation to be implemented. More discussion regarding the low flow analysis can be found in Paragraph 10(A)(6)(b) – *Low Flow Analysis* and 10(A)(10)(h) – *Indirect Impacts* below.

Regarding Condition 7 (Fill criteria), I have independently reviewed the criteria selected by the PCHB. First, the PCHB appear to have concentrated their review on the criteria established for the majority of the embankment. A separate set of criteria was also

[17] PCHB 01-160. Final Findings of Fact and Conclusions of Law, page 49, lines 3-6.

established for the drainage layer cover. In most instances, the PCHB appears to have selected either the lowest back calculated number available or Puget Sound background levels, whichever was lower.[18] However, for three of the constituents, chromium, selenium, and silver, the PCHB selected criteria lower than background levels. While selecting the most protective criteria is understandable, selecting levels below natural background levels is not. If some of the constituents are naturally at higher levels that have not raised either human or aquatic health concerns, then the lower criteria are not justifiable. The Services also reviewed the fill criteria during the ESA consultation process and made modifications to Ecology's initial levels as reflected in the 21 September 2001 WQC. The Services determined these modified criteria were protective of aquatic species, ESA listed species in particular. Ecology, the agency with primary responsibility regarding water quality standards and implementation of Section 307 in the state of Washington, also believed the criteria established in the WQC were adequately protective. Both the USFWS and Ecology also believed the more restrictive criteria for the drainage layer and less restrictive criteria for the remainder of the embankment were adequate for protection of the aquatic environment. Based on my review, I have determined this PCHB condition does not need to be added to the permit. See Paragraph 10(A)(7) below for additional discussion. As for the fill already in place, it meets the criteria in place at the time the fill was imported. The PCHB did not make the criteria retroactive to the fill already in place.

Regarding Condition 8 (SPLP testing), the SPLP is an EPA recognized test, EPA Method 1312, used to evaluate the potential for leaching metals into ground and surface waters. This test more realistically assesses metal mobility under actual field conditions and is the method of choice for evaluating the fate and transport of metals.[19] The USFWS also allowed the use of SPLP testing through their Section 7 BO. They determined the fill criteria, including the use of the SPLP test, were protective of aquatic species, ESA listed species in particular. Because this is a scientifically recognized valid test, I have determined this PCHB condition not allowing SLPL testing does not need to be added to the permit.

Regarding Condition 9 (Number of fill testing samples), Ecology's expert testified that more samplings were needed than specified in the WQC. This condition has been added to the permit.

Regarding Conditions 13 (Water quality exceedances) and 14 (Extension of monitoring if there are exceedances), the Corps does not have the authority to require Ecology to take any compliance actions regarding any aspect of their program. If water quality exceedances in either surface or ground water criteria are found, pursuant to 33 CFR 325.7, the DE may modify, suspend, or revoke the permit as necessary. These PCHB conditions specifying what Ecology "shall" do have not been added to the permit.

[18] Various starting points for the back calculations were used including ambient water quality criteria, drinking water criteria, chronic and acute fish exposure criteria.
[19] The SPLP test was used by EPA for the Bunker Hill cleanup project for the fate and transport study.

Regarding Condition 15 (AOMA contamination monitoring), the PCHB condition just clarifies the indefinite nature of the monitoring required in the 21 September 2001 WQC. This condition has been added to the permit.

Regarding Condition 16 (Water right requirements), because implementation of the low flow mitigation is necessary to mitigate for potential impacts, a special condition, condition h below, has been added to the permit requiring the Port obtain the water right, if necessary, prior to paving the third runway and specified taxiways and construction of the SASA building and associated paving. See additional discussion regarding low flow in Paragraph 10(A)(6)(b) below.

In conclusion, I have determined the measures listed above and required in the WQC, in some of the PCHB conditions, in the NPDES permits, and/or by USFWS under ESA (see Paragraph 9(I)(1)(b) below), will adequately offset both short and long-term adverse water quality impacts. No additional mitigation is warranted. General Condition 5 of the standard DA permit makes an issued WQC and any of its conditions a condition of the DA permit. As discussed in Paragraph 7(J) above, the WQC issued on 21 September 2001 is considered valid. In addition, the following special conditions have been added to the permit as discussed above.[20]

a. The stormwater BMPs for better removal of dissolved metals, shall be selected from the Enhanced Treatment Menu found in the August 2001 edition of the *Stormwater Management Manual for Western Washington*.

b. The Port shall sample stormwater above and below stormwater outfalls and monitor the hardness of the receiving waters (Miller, Walker, and Des Moines creeks).

c. The Port will perform the water quality toxicity testing on specific sensitive organisms. These organisms and testing protocols will be approved by Ecology prior to testing. Testing shall measure injury, as well as mortality of those organisms.

d. 100% of the stormwater management facility retrofit shall be completed by the time 50% of the paved impervious surfaces have been constructed. Status reports will be provided to U.S. Army Corps of Engineers, Seattle District, Regulatory Branch, every 6 months from the date of permit issuance documenting the amount of paved impervious surface constructed and the amount of retrofitting completed until the 100%/50% goal is reached.

[20] The wording of the PCHB conditions have been modified to increase understandability and enforceability, but the intent of the conditions have not been changed. For example, the names of documents, reporting requirements, and the references for acronyms were added.

e. Water will be released from the low-flow vaults as described in the *Low Streamflow Analysis* dated December 2001 and at the rates as specified in Table 4-2 of the *Low Streamflow Analysis*, or as subsequently modified and approved by the U.S. Army Corps of Engineers, Seattle District, Regulatory Branch. Documentation of this release will be included in the monitoring reports described in the NRMP.

f. The minimum number of test samples of the proposed fill shall be increased to reflect the number of samples required under MTCA.

g. The monitoring in Condition F(1) of the Section 401 Water Quality Certification is modified so that monitoring continues for as long as there are contaminants in the Airport Operations and Maintenance Area (AOMA).

h. A water right to use the water stored in the low-flow vaults for mitigation of low flow impacts in Walker Creek must be obtained before commencing paving of the third runway and the associated new taxiways west of the coordinates listed below. A water right to use the water stored in the low-flow vaults for mitigation of low flow impacts in Des Moines Creek must be obtained before commencing construction of the SASA building and associated paving. A copy of the water right(s) will be provided to the U.S. Army Corps of Engineers, Seattle District, Regulatory Branch prior to commencing paving and/or construction of the SASA building.

Taxiway	Coordinate
A	E12230
E	E12230
J	E12230
N	E11990
P	E12000
Q	E12230

D. Historic, Cultural, Scenic, and Recreational Values (33 CFR 320.4(e)).

(1) Impact. The FAA has been designated the lead Federal agency for compliance with Section 106 of the NHPA. However, the Corps is a concurring party to any measures proposed by FAA and/or the State Office of Archaeology and Historic Preservation (SHPO). Analysis of the proposed project shows the potential for impacting one eligible for listing historical site and two potential archaeological sites.

The Sunnydale Elementary School has been identified as being eligible for listing as a historical site. The school is eligible because of its significant role in the development of the Burien area and retaining its character defining features conveying its historic function as a school. The potential impacts to the school would be from proposed sound insulation construction for existing noise exposure and noise anticipated under the proposed airport improvements.

Impacts to potential archaeological sites would be from excavation activities at either Vacca Farms or Tyee Golf Course.

(2) Mitigation. The FAA has coordinated with the SHPO regarding the Sunnydale School. The SHPO determined the school would be eligible for listing. The FAA and the Port agreed to sound insulate the school in a manner that maintains the historic and architectural integrity of the school.

Regarding the archaeological sites, the Port has prepared an archaeological monitoring plan in order to address potential impacts to unknown sites. The plan was forwarded to and approved by the SHPO.

(3) Findings. I have determined the necessary coordination under Section 106 has been completed. The Port will continue any additional coordination as required if sound insulation is proposed in the future. As for the archaeological sites, the following special conditions will be added to the permit to ensure the monitoring activities are completed:

a. A professional archaeologist must be on-site to monitor for the presence of archaeological resources during all ground disturbing construction within the channel excavation area at Vacca Farm and western portion of the Tyee Valley Golf Course areas. The archaeological monitoring plan prepared by Larson Anthropological Archaeological Services Limited, dated 7 June 2001, must be implemented in its entirety.

b. A summary report of the findings of the archaeological monitoring or status report must be submitted to the U.S. Army Corps of Engineers, Seattle District, Regulatory Branch within 13 months of permit issuance and yearly thereafter until construction in these areas have been completed.

c. If human remains or archaeological resources are encountered during construction, all ground disturbing activities shall cease in the immediate area and the permittee shall immediately (within one business day of discovery) notify the U.S. Army Corps of Engineers (Corps), Federal Aviation Administration (FAA) and the State Historic Preservation Officer (SHPO). The permittee shall perform any work required by the Corps in accordance with Section 106 of the National Historic Preservation Act and Corps regulations.

E. Effects on Limits of the Territorial Sea (33 CFR 320.4(f)). Not applicable.

F. Consideration of property ownership (33 CFR 320.4(g)). Authorization of work or structures by the Corps does not convey a property right, nor authorize any injury to property or invasion of other rights. The rights considered in the public interest review include the right to reasonable private use, the general right to protect property from erosion, and the right to access navigable waters. The right to use the property is subject to the rights and interests of the public regarding Federal regulations for

environmental protection. The Corps also considers potential interference with authorized Federal projects.

The Port has obtained ownership of all the lands where the work is to occur, both at STIA and at the Auburn mitigation site. There are no concerns with the proposed projects regarding protecting the property from erosion, access to navigable waters, or interference with authorized Federal projects.

(1) Findings. I have weighed the rights of the Port to reasonable use of their property versus the rights of the public for environmental protection in making my decision. I have determined the proposed projects comply with the Section 404(b)(1) Guidelines, NEPA, and all other applicable environmental Federal laws and regulations and does not interfere with any other Federal projects.

G. Activities Affecting Coastal Zones (33 CFR 320.4(h)). On 21 September 2001, Ecology issued a revised certification that the proposed project complies with Section 307(c)(3) of the Coastal Zone Management Act of 1972 as amended, and the approved Washington State Coastal Zone Management Program.

H. Activities in Marine Sanctuaries (33 CFR 320.4(i)). Not applicable.

I. Other Federal, State, or local Requirements (33 CFR 320.4(j)). In Paragraph 7 above, numerous Federal, State, and local authorities were described including the status of their reviews. Three authorities in particular were applicable regarding this project and are discussed below.

(1) Endangered Species.

(a) Impact. The FAA has been designated the lead Federal agency for compliance with Section 7 of the ESA. They completed informal consultation with USFWS in 1997 regarding potential impacts to bald eagles and peregrine falcons. Since that time additional species have been listed. On 15 June 2000, the FAA reinitiated consultation with the Services regarding potential impacts to federally listed species. The Biological Assessment (BA) dated June 2000 describes the potential impacts to these federally listed species. Included in the BA were conservation measures, i.e. primarily implementation of the NRMP and WHMP, proposed by the Port.

The Puget Sound chinook (*Oncorhynchus tshawytscha*), threatened, and Coastal/Puget Sound bull trout (*Salvelinus confluentus*), threatened, are not present in Miller, Walker, or Des Moines creeks. They are, however, present at the mouths of the creeks in Puget Sound. Potential impacts to the species would be from water quality impacts to the creeks that could reach Puget Sound. These impacts include construction related sedimentation from imported fill, stormwater quality and quantity, pollutants generated from operation of the airport, etc. See Paragraph 9(C) above for a detailed discussion

of potential water quality impacts. The FAA determined the project "may affect, but is not likely to adversely affect" chinook salmon, its critical habitat,[21] and bull trout.

Bald eagles (*Haliaeetus leucocephalus*), threatened, are present in the action area and have established nesting sites and foraging perches potentially affected through various disturbances. Management of wildlife, including bald eagles already occurs at the airport to minimize the risk of an aircraft bird strike. The FAA determined that the project "may affect, but is not likely to adversely effect" bald eagles.

Marbled murrelets (*Brachyramphus marmoratus*), threatened, may be present in the action area either in the adjacent marine waters or flying over the airport. The primary impact would be from an aircraft bird strike. However, as there is no designated critical habitat in the action area, the probability of this occurring is low. The FAA determined the project "may affect, but is not likely to adversely effect" marbled murrelet.

(b) Consultation. The USFWS and NMFS completed consultation on 22 May 2001 and 31 May 2001 respectively. Both concurred with the determinations made by the FAA.

In their Biological Opinion, the USFWS included thirteen ESA conservation recommendations to minimize or avoid adverse effects. They also included seven impact reduction measures to ensure the leachate from the embankment fill does not result in contamination of aquatic resources. The NMFS included eight ESA conservation recommendations in their letter of concurrence.

The Corps has the option of adding the ESA conservation recommendations as special conditions to the permit. To make this determination, the Corps requested input from the Port. As negotiated directly with USFWS, the Port agreed to implement the seven leachate impact reduction measures (see the USFWS BO dated 22 May 2001).[22] As for the thirteen remaining USFWS and all the NMFS recommendations, the Port has provided the following information.

USFWS 1/NMFS 5 – Increased buffer widths (150 feet for USFWS; "where feasible" by NMFS). The Port is providing 100-foot buffers on average and believes this is protective of the aquatic environment. Justification for this width is provided in Table 4.2-1 of the NRMP, p. 4-25 through 4-29. In addition, the restricted covenant for Miller Creek requires any trees being felled as a hazard to persons or property will be left in the mitigation area as woody debris. This will help to restore more natural ecological functions in the riparian zone.

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[21] Critical habitat for chinook was later withdrawn by NMFS in May 2002.

[22] The leachate condition 2 allowed the Port the option of using the Synthetic Precipitation Leaching Procedure (SPLP) to confirm the suitability of the soil of the drainage layer cover that exceeds the back-calculated values. The PCHB Condition 8 does not allow the use of SPLP. However, because the USFWS gave the Port the option of using SPLP, not using the procedures does not require reconsultation with USFWS.

USFWS 2/NMFS 1 – Monitor fish use to determine success of habitat enhancement and restoration activities. Condition I.1.e.vi. of the WQC requires monitoring of the low flow conditions, including fish use.

USFWS 3/NMFS 2 – Sample for invertebrates. The Port is monitoring the overall biotic conditions of the streams and will be following Benthic Index of Biotic Integrity (B-IBI) sampling protocols as discussed in Section 5.2.1 of the *Low Flow Analysis* (Port of Seattle, 2001a) and required by the WQC.

USFWS 4 – Native plant salvaging. The Port believes the plant material present in the wetland areas being impacted is not suitable for transplanting either because of its size, the species, or the quality of the plant. They are also concerned about spreading invasive plant seeds within the root balls of the salvaged plants.

USFWS 5 – Reuse of large diameter trees. The Port has already voluntarily begun salvaging trees with root wads from the clearing activities for future use in the mitigation efforts.

USFWS 6 – Installation of large woody debris. The Port is following WDFW standards regarding species, sizing for expected stream flows, and installation criteria as the USFWS did not provide any specific standards.

USFWS 7/NMFS 8 – Pesticide use. The USFWS requested pesticides and herbicides not be used except where unavoidable and with certain recommendations. The NMFS recommended mechanical methods be used. The Port's integrated weed management strategy emphasizes mowing, cutting, grubbing, or girdling plants. The use of herbicides will be minimized and will use EPA approved products and limited to those that are non-toxic to aquatic organisms. Selection of the herbicides will follow the guidelines found in Conservation Recommendation 7 of the USFWS BO.

USFWS 8/NMFS 6 & 7 – Reduce or eliminate airport sources of copper and zinc. The Port believes their existing WQC, NPDES permit, and the conditions of the PCHB adequately address this concern. The NPDES permit requires monitoring of these metals. When levels are found to exceed the standards, bioassays are required to determine toxicity. Based on the results, additional BMPs may be required.

USFWS 9 – New structures should not include pollution generating surfaces. The authorization of the proposed development will create new pollution generating surfaces. The Port believes the NPDES permit and the WQC will adequately regulate the pollution generated from these surfaces.

USFWS 10 – Use of anionic PAM instead of cationic PAM. The USFWS was concerned that the use of cationic PAM could adversely affect forage fish and bull trout. However, the potential for exposure for bull trout was limited so they only made it a recommendation. The Port stated they use anionic PAM or other less toxic flocculent products available as regulated by Ecology.

USFWS 11/NMFS 3 – Evaluate the effectiveness of erosion and sediment control measures. The Port believes monitoring the effectiveness of these measures is already a requirement of the WQC and NPDES permit.

USFWS 12 – Copies of monitoring reports. Numerous monitoring reports are generated every year. The Port has voluntarily agreed to send an index of these reports to the USFWS and will provide copies of any reports they request. The Port will provide this index for the 15-year period covered by the NRMP, or longer if the NRMP monitoring period is extended.

USFWS 13 – Bull Trout study. The USFWS was recommending additional research be conducted to better define population status and use in watersheds and marine areas where Port and FAA activities occur. The Port did not agree to this condition, as the project being permitted does not directly impact bull trout. They believe the information provided in the BA was sufficient at this time. If other projects sponsored by either the Port or FAA do directly impact bull trout, then additional studies as requested may be appropriate.

NMFS 4 – Monitoring instream flows. The NMFS is recommending the stream flows be monitored to ensure the peak flows have been reduced and the low flows have been maintained. The Port is already required to complete this monitoring as part of the Stormwater Management Plan.

(c) Findings. I have determined that FAA has completed the necessary coordination under Section 7 of the ESA. To ensure the conservation measures discussed in the BA are implemented, I have added the following condition to the permit.

a. You must implement and abide by the ESA requirements and/or agreements set forth in the *Biological Assessment, Master Plan Update Improvements, Seattle-Tacoma International Airport*, dated June 2000, in its entirety. The U.S. Fish and Wildlife Service (USFWS) concurred with a finding of "may affect, not likely to adversely affect" based on this document in a Biological Opinion (BO) dated 22 May 2001 (USFWS Reference Number 1-3-96-I-29, 1-3-99-SP-0744). The BO contains mandatory measures that are incorporated by reference in this permit. The National Marine Fisheries Service (NMFS) concurred with a finding of "may affect, not likely to adversely affect" based on this document on 31 May 2001 (NMFS Reference Number WSB-00-318). Both agencies will be informed of this permit issuance. Failure to comply with the commitments made in this document and as described in the USFWS BO constitutes non-compliance with the ESA and your Department of the Army permit. The USFWS and/or NMFS are the appropriate authority to determine compliance with ESA.

As for the 13 USFWS and all of NMFS conservation recommendations, I have not included them as special conditions for the reasons stated below.

Increased buffer widths. Providing large woody debris and nutrients to the streams is one of the goals of the NRMP. As documented in the NRMP, I believe the width of 100 feet is well supported in the scientific literature for streams of this nature. Therefore, this recommendation was not added as a condition to this permit.

Monitor fish use. The WQC requires monitoring of fish use and compliance with the WQC is already a condition of this permit. Therefore, no additional condition is required.

Sample for invertebrates. The *Low Flow Analysis* and the WQC require monitoring of invertebrates using the B-IBI sampling protocol. Compliance with the WQC is already a condition of this permit. Therefore, no additional condition is required.

Native plant salvaging. Invasive species are a problem for the long-term viability of any mitigation site. Transplanting inferior species that could also spread invasive species is not desirable for the long-term viability of the mitigation. Therefore, this recommendation was not added as a condition to this permit.

Reuse of large diameter trees. The Port has voluntarily agreed to salvage and reuse large trees with root wads as requested. As this is in the Port's best interest to reduce construction costs, this recommendation was not added as a condition to this permit.

Installation of large woody debris. The WDFW has the hands-on expertise regarding installation of large woody debris and has developed specific standards regarding the installation of large woody debris. The NRMP also specifies the standards being followed. As the USFWS did not provide specific standards and compliance with the NRMP is already a condition of the permit, this recommendation was not added as a condition to this permit.

Pesticide use. The Port has volunteered to use the herbicides recommended by USFWS and will emphasize mechanical means of removal before using pesticides and herbicides as documented in the NRMP. Compliance with the NRMP is already a condition of the permit. Therefore, this recommendation was not added as a condition to this permit.

Reduce or eliminate airport sources of copper and zinc. The Port has already identified and is eliminating one source of zinc at the airport through the removal of zinc coated metal roofs. The WQC and NPDES permit provide sufficient oversight and control for ensuring water quality standards are met. Compliance with the WQC, and the NPDES permit by reference, is already a condition of this permit. I have also added PCHB Conditions 1, 2, and 3 addressing water quality issues. Therefore, no additional condition is required.

New structures should not include pollution generating surfaces. The proposed project cannot be constructed without increasing the amount of impervious surface present at the airport. By its nature, the stormwater from these impervious surfaces may contain

pollutants. Therefore, this recommendation cannot be implemented. However, the WQC, NPDES permit, and the selected PCHB conditions I have added to the permit will minimize the adverse impacts to the aquatic environment. Therefore, no additional condition is required.

Use of anionic PAM instead of cationic PAM. The Port, following Ecology regulations, does not use cationic PAM. Therefore, no additional condition is required.

Evaluate the effectiveness of erosion and sediment control measures. The WQC and NPDES permit require monitoring. This monitoring is sufficient to ensure protection of the aquatic environment. Compliance with the WQC, and the NPDES permit by reference, is already a condition of this permit. Therefore, no additional condition is required.

Copies of monitoring reports. The Port is going to provide an index of all the monitoring reports generated during the monitoring period. If USFWS wants any copies of the report, the Port will provide them. No additional condition is required.

Bull Trout study. Performing general research on bull trout is beyond the scope of this permit action. The Port has provided the necessary site-specific information for USFWS to make their determination. Future actions by the Port or FAA will have to provide the same information and will perform the necessary studies to obtain the project specific information. No additional condition is required.

Monitoring instream flows. The Port is already performing the peak and low flow monitoring as part of their Stormwater Management Plan as required by their WQC and NPDES permit. Compliance with the WQC, and the NPDES permit by reference, is already a condition of this permit. Therefore, no additional condition is required.

(2) Essential Fish Habitat.

(a) Impact. The FAA coordinated the required consultation under Section 305 of the Magnuson-Stevens Fishery Conservation and Management Act regarding the proposed actions that may adversely affect EFH. An EFH analysis looks at the potential impacts to the waters and substrates used by fish for spawning, breeding, feeding, or general habitat. The BA describes the potential impacts to Coastal Pelagic and West Coast groundfish species. A supplemental document dated December 2000 describes the potential impacts to Pacific Coast salmon.

The coastal pelagic and groundfish species in the action area are found in Puget Sound off of the mouths of Miller and Des Moines creeks and at the IWS outfall. Impacts to these species could be from adverse affects to water quality. The FAA determined the project “may affect, but is not likely to adversely affect” for both groups of species.

The salmon species considered in the EFH analysis include chinook (*O. tshawytscha*), coho (*O. kisutch*), and pink (*O. gorbuscha*). Only the coho are present in Miller,

Walker, and Des Moines creeks. The chinook and pink salmon are present at the mouths of the creeks in Puget Sound. Potential impacts to the species would be from changes to water quality, water quantity, and habitat structures. See Paragraph 9(C) above for a detailed discussion regarding water quality and quantity. Regarding habitat structures, the potential impacts include vegetation clearing, riparian regarding, and channel reconstruction and relocation. The FAA determined the project would have "no adverse effect" for coho and there would be "no effect" for the chinook and pink salmon.

(b) Consultation. The NMFS completed EFH consultation on 31 May 2001 for the coastal pelagic and groundfish and 9 August 2001 for the salmon. NMFS concurred with the determinations made by the FAA without adding any EFH conservation recommendations based on the understanding the conservation measures discussed in the BA will be implemented.

(c) Findings. I have determined that FAA has completed the necessary coordination for EFH. The ESA special condition will ensure the conservation measures discussed in the BA are implemented.

(3) EO 12898 – Environmental Justice. The EO requires that, to the greatest extent practicable and permitted by law, each Federal agency conduct its programs, policies, and activities so they do not have the effect of excluding persons or populations from participating in, denying the benefits of, or discriminating against because of their income level or ethnic background. The demographics of the immediate area and King County were examined to determine whether locating the third runway at STIA will disproportionately impact minority or low-income communities. As a result of the research, the Corps found the demographics of the area were relatively similar to the surrounding areas. The proposed project is located in a geographical area with slightly more Black/African Americans and Hispanic/Latino populations than other parts of King County. The Cities of Burien and Tukwila also have slightly higher populations of individuals over 65 and families with children less than 18 or single mothers with children less than 18 living below the poverty level.[23]

To help ensure there were no groups excluded from participating in and providing information for the permit process, the Corps provided and gathered information through multiple methods. Each mailing of the Corps' public notices and announcements of the public hearings were sent to over 500 people in the vicinity including various news organizations, local libraries, adjacent property owners, and any individuals requesting a copy. Information has also been made available on the Seattle District's web site. Copies of many of the reports were available not only at the Corps building but several locations closer to the airport. Many articles and announcements have also appeared in the Seattle Post Intelligencer, Seattle Times, Tacoma New Tribune, Highline Times, South County Journal, and several other local newsletters

[23] Data for these determinations was gathered from the U.S. Census Bureau web site http://factfinder.census.gov/servlet/BasicFactsServlet.

including those published by the opposition groups. The public record was held open throughout the permit process for anyone to submit comments even outside of the formal comment periods. All of the information provided was reviewed and considered in the final decision. Numerous meetings were held with the citizens groups representing the communities surrounding the STIA. The final hearing was also held over a two-day period (one of the days being a Saturday) and at a location where everyone who wanted to attend and speak could do so. Copies of the transcripts were made available for the public's review. Numerous Freedom of Information requests where also received and fulfilled.

(c) Findings. I have determined no extraordinary measures were warranted regarding public participation based on the homogeneous nature of the areas demographics. No special translations or distribution methods were deemed necessary. No undue risks or pressures were identified for any one minority or low-income population. Therefore, I have complied with the intent of the EO on Environmental Justice. The FAA made a similar conclusion in the ROD dated 3 July 1997.

J. Safety of Impoundment Structures (33 CFR 320.4(k)). Not applicable.

K. Floodplain Management (33 CFR 320.4(l)). To be in compliance with Executive Order (EO) 11988, both the long and short term impacts associated with the occupancy and modification of the base floodplain must be avoided as well as avoidance of the direct and indirect support of development in the base floodplain wherever there is a practicable alternative. To make this determination, the following four steps are taken:

- Avoid development in the base floodplain unless it is the only practicable alternative;
- Reduce the hazard and risk associated with floods;
- Minimize the impact of floods on human safety, health, and welfare; and,
- Restore and preserve the natural and beneficial values of the base floodplain.

(1) Impacts. Direct impacts to the floodplain where base elevations have been determined are limited to the area around Miller Creek at Vacca Farms where S 154/156th Street is being realigned. Approximately 8,455 cubic yards of flood storage would be filled.

Indirect impacts could occur in all three watersheds if there are increased volumes of stormwater runoff and peak flows. This could cause downstream flooding, scour, and bank erosion.

(2) Mitigation. As discussed in Appendix B, the Port's proposed project has been determined to be the least environmentally damaging practicable alternative to meet the project purpose. Therefore, impacts to the floodplain cannot be avoided. The Port proposes to reduce and minimize the risks by accounting for all flood storage, including that provided by wetlands, in the calibration of the Hydrological Simulation

Program - Fortran model. The Port will design stormwater detention facilities using this model to ensure the flow mitigation is provided to account for impacted wetlands. The Port's proposed mitigation is intended to restore some natural floodplain by creating approximately 9,589 cubic yards of flood storage adjacent to Miller Creek at Vacca Farms.

(3) Findings. I find the potential adverse impacts to floodplains, both short and long term, have been avoided where practicable and adverse impacts have been minimized and mitigated with the creation of additional floodplain and the design of the stormwater management system. I also find no additional mitigation is warranted. The FAA made a similar determination in their ROD dated 3 July 1997.

L. Water Supply and Conservation (33 CFR 320.4(m)). This review evaluates the use of water resources to ensure the availability of water for alternative uses including reducing demand, improving efficiency, and minimizing the need to develop new water supplies. The FAA determined annual water consumption is forecasted to increase even with implementation of recommended conservation activities. However, the rate of consumption will be reduced per person with conservation measures. Some utility realignment and abandonment will be required. Based on my review, I find no reason to disagree with FAA's conclusions.

M. Energy Conservation and Development (33 CFR 320.4(n)). This review evaluates the use of electricity, natural gas, aviation fuel, diesel fuel, and gasoline at the airport and possible conservation measures. The FAA has determined the proposed project does not impact the availability of the various energy sources for other uses and no mitigation is warranted. Based on my review, I find no reason to disagree with FAA's conclusions.

N. Navigation (33 CFR 320.4(o)). Not applicable.

O. Environmental Benefits (33 CFR 320.4(p)). This review evaluates the components of the proposed project designed specifically for the purpose of benefiting the environment. The Port has not included any project components for this purpose. However, as discussed throughout this document, the Port has proposed compensatory mitigation in areas such as noise reduction, stormwater management, floodplain replacement, wetland creation, enhancement, and restoration, low streamflow, and stream and buffer enhancement to offset the potential impacts. All of these activities will be of benefit to the environment. Therefore, I have determined when balancing the potential impacts with the environmental benefits of the mitigation, the baseline conditions within the project area are at least maintained (see Appendix B and C for additional discussion).

P. Economics (33 CFR 320.4(q)). For the purposes of the Corps public interest review, "it will generally be assumed that appropriate economic evaluations have been completed [by the applicant], the proposal is economically viable, and is needed in the market place. However, the district engineer in appropriate cases, may make an

independent review of the need for the project from the perspective of the overall public interest" (33 CFR 320.4(q)).

(1) Impacts. Concerns have been raised by the opposition groups regarding the need for the project in light of the events of September 11th. They also have questioned the need for the third runway because of the economic downturn of the airline industry and the reduction in the number of operations. The Corps shared the concern regarding the continuing need for the project after September 11th and therefore, requested additional information (see Appendix B and Paragraph 10(A)(9) below).

Concerns have also been raised by individuals regarding potential impacts to the community because of loss of tax revenue and property value. Home prices and land values in the vicinity of airports can be reduced because of the noise and air pollution. This loss in value can also impact the local governments through loss of property tax revenues. While the Corps does not share this concern, we did evaluate the potential impacts (see Paragraph 10(A)(10)(c) below). The total cost of the project has also been questioned.

(2) Mitigation. The Port's Noise Remedy Program is intended to compensate residents for loss of property values.

(3) Findings. The Port provided an analysis of the effects of September 11th on the airline industry. This analysis found the delays were reduced to 1994 levels, the point in time where delay levels indicated the need to explore alternatives. The delay numbers are beginning to increase and are expected to continue to increase. They are however, still behind the 2000 numbers, which were the peak years. Many national forecasts have predicted a recovery in air travel in the near term and growth over the long term. The FAA also confirmed the operational levels are expected to return to pre-September 11th levels sometime in 2003 or 2004 (USDOT - FAA, 2002). The airport also predominately serves origin-destination passengers, which is not as vulnerable to changes in airline service plans as hub airports.[24] I find that the Port's original need for the project has not changed as a result of the September 11th tragedies. Additional discussion regarding project need can be found in Paragraph 10(A)(9) below and Appendix B, Paragraph 3(b).

Regarding loss of property values and tax revenues, the primary effects would have been experienced when the airport, jets in particular, first began service in the 1960's. The Port and FAA also performed an economic benefit review as part of the Federal grant process and the review is documented in FAA's ROD dated 3 July 1997. The review concentrated on impacts to local communities based on property values and revenue losses.

[24] From FEIS Appendix R, Response to Comments, page R-7 and reiterated in 3 December 2001 Leigh Fisher Associates letter.

The FAA holds primary Federal responsibility for determining the need for improvements, changes, and/or additions to airports. The Port has prepared a cost/benefits analysis as part of the Federal Grant process and it was reviewed and approved by FAA on 3 July 1997. An amendment to the original Letter of Intent with revised construction costs were submitted to the FAA on 12 July 2000 (Port, 2000f). The revision increased the costs from $587 million to $773 million. This placed the estimated ratio of benefits ($2.7 billion) versus cost at 4.5 to 1. There have not been any additional revisions to the costs since 2000. While there has been a decrease in the number of operations at the airport since the last revision that would affect the benefit/cost ratio, I have reviewed all of the information provided and find the changes are not contrary to findings in the FAA's initial analysis. Therefore, the proposed project is determined to still be cost-beneficial.

Q. Mitigation (33 CFR 320.4(r)). This review examines efforts to avoid, minimize, rectify, reduce, or compensate for the resource losses caused by the proposed project. The potential impacts of the proposed project and the Port's proposed mitigation efforts are discussed throughout Paragraph 9 of the ROD, Appendix B, and Appendix C. In summary, the Port is proposing mitigation for the impacts to wetlands, fish and wildlife, water quality, stormwater, low flows, cultural resources, endangered species, essential fish habitat, noise, floodplains, water conservation, etc.

(1) Findings. I have determined the Port's proposed mitigation adequately avoids, minimizes, rectifies, reduces, and/or compensates for the proposed impacts. Special conditions have been added to the permit to ensure the mitigation efforts within the Corps' jurisdiction are implemented as designed (see Paragraph 12(M) below). No additional mitigation outside of that documented in this decision document is warranted.[25]

R. Safety. Several individuals and the opposition groups raised aircraft safety concerns regarding possible wind shear problems with the MSE walls and the potential for incursions because of aircraft crossing active runways. These issues are the responsibility of the FAA as they are the Federal experts on flight safety and airport operation. The Corps did request the FAA provide their analysis on the issue of aircraft safety and the possible aerodynamic effects (e.g. wind sheer) of the MSE walls. The FAA addressed the issue in a letter dated 19 June 2001 and concluded "they are relatively certain that the wall will not cause a wind shear situation" and provide their rationale for this decision. Regarding the concern over possible incursions, the FAA had addressed this issue in the various EIS's. In their ROD they determined "air traffic control and airspace management procedures to effect the safe and efficient movement of air traffic to and from the proposed new runway" would be developed. Paragraphs 10(A)(3)(d) and 10(A)(11) below provide additional information regarding these concerns.

[25] The PCHB Conditions 10, 11, and 12 did address concerns regarding the mitigation plan approved by Ecology (see Paragraph 9(A) above and 10(A)(5) below for additional discussion).

(1) Findings. The FAA holds primary Federal responsibility for determining airport and aircraft safety both during takeoff and landing and on the ground. They have reviewed the proposed project for airport and aircraft safety concerns including potential wind shear issues and incursions. They have directed the Port in their ROD to develop air traffic control and airspace management procedures and to perform a flight check to verify the safety of the runway. Approval of this flight check and plan by FAA will be required. Therefore, no further review by the Corps is required.

S. Cumulative Impacts. In addition to the cumulative impacts analysis presented in the FEIS and FSEIS by the FAA, the Corps examined the cumulative impacts on a watershed basis including the past, present, and reasonably foreseeable future projects. The Corps believed this additional review was necessary to comply with the Council for Environmental Quality guidance regarding cumulative impacts. The geographic basis for this analysis was the Miller, Walker, and Des Moines Creek watersheds.[26]

The Corps examined and concluded that three major kinds of activities have contributed to, and continue to contribute to, potential cumulative impacts to the region. These activities are agriculture, transportation, and urban development. The Corps determined the potential primary impacts for each activity then the functional changes and the consequences of the changes. These lists do not represent a compilation of every potential impact or change possible but the major impacts, changes, and consequences in these watersheds.

(1) Historic Landscape Conditions. The conditions of the historic landscape were interpreted from 1936 aerial photographs showing the conditions in the three watersheds prior to the initial construction of the airport. These conditions establish the baseline for the cumulative impact assessment.

In 1936, the primary land use was undeveloped land consisting of agricultural activities, parks, lakes, forested areas, grasslands, etc. A network of the major roads were in place, e.g. SR 99, Des Moines Memorial Drive, 1st, 8th, 16th, and 24th Avenues S, Sylvester Road, S 176th Street, etc. Housing developments were sparse and residential development was largely related to farms, around the various lakes, or along the shoreline in the City of Des Moines.

With this low level of development, the important landscape features were:

- Intact and substantial expanses of forested riparian corridors along Miller Creek below Ambaum Boulevard, along Walker Creek west of 1st Avenue S, and along Des Moines Creek within the Des Moines Creek Park and below S 200th St.
- Ditching of the creeks through farmland areas.

[26] WRIA watershed boundaries were not used because these watersheds are included in the Green River WRIA even though they flow directly into Puget Sound.

- Large expanses of connected open areas of forests, grasslands, previously logged forests, or farmland.
- Very small and sparse expanses of impervious surfaces.

These features allowed several important ecological processes to be present. The intact riparian corridors supported good habitat for any fish present in the creeks as well as downstream support. Miller Creek at this time had a broad intertidal delta with some estuarine wetlands remaining. The mouth and estuary of Des Moines Creek were already largely developed. However, the channelized creeks through the farmlands would have reduced the quality of the fisheries habitat.

The expanses of open areas would have helped to support a population of small mammals and a diverse population of birds. While the extent of the farmlands would have impacted the diversity of the wildlife in the area, houses were far enough apart for corridors between the various habitats to be present.

The expanse of open areas and the limited amount of impervious surface would have allowed the precipitation to infiltrate into the groundwater thus supporting the baseflows of the creeks. Floodwaters would also have had open areas to expand into during storm events.

Estimates of the wetlands most likely present in the watersheds indicate several large wetland complexes were present. Nearly all of the larger wetlands present in 1936 are still present today, albeit impacted to various degrees. Several smaller wetlands were also present in the area. The area where the airport is now located appears to have been largely uplands with only a few small wetlands present at the time of construction.

(2) Major changes. The changes in the landscape conditions for the cumulative impact assessment were established using aerial photographs from 1936, 1948, 1961, 1970, 1972, and 1995. As mentioned above, the three major activities impacting the landscape over time were agriculture, transportation, and urban developments. Figures 1 through 3 depict the primary impacts from these activities, the major functions impacted, and the consequences of these changes. The majority of the agricultural impacts had already largely occurred in the watersheds by 1936. Many large and small farms were present in the area, especially at what is known as Vacca Farms and what is now Tyee Golf Course. The primary impacts from the farming was to increase the potential of pesticides and herbicides getting into the water, channelization of Miller, Walker, and Des Moines creeks through the fields, and alteration of wetlands. Ditches were also created to drain many of the low farm areas to the creeks. Many of the wetlands were also mined for peat. As a result of these changes water quality would have been adversely impacted, floodplains may have been more isolated, habitats would have been changed, hydrology may have become flashier, habitat would have been more fragmented, hydrology patterns altered, and some habitats would have been lost.

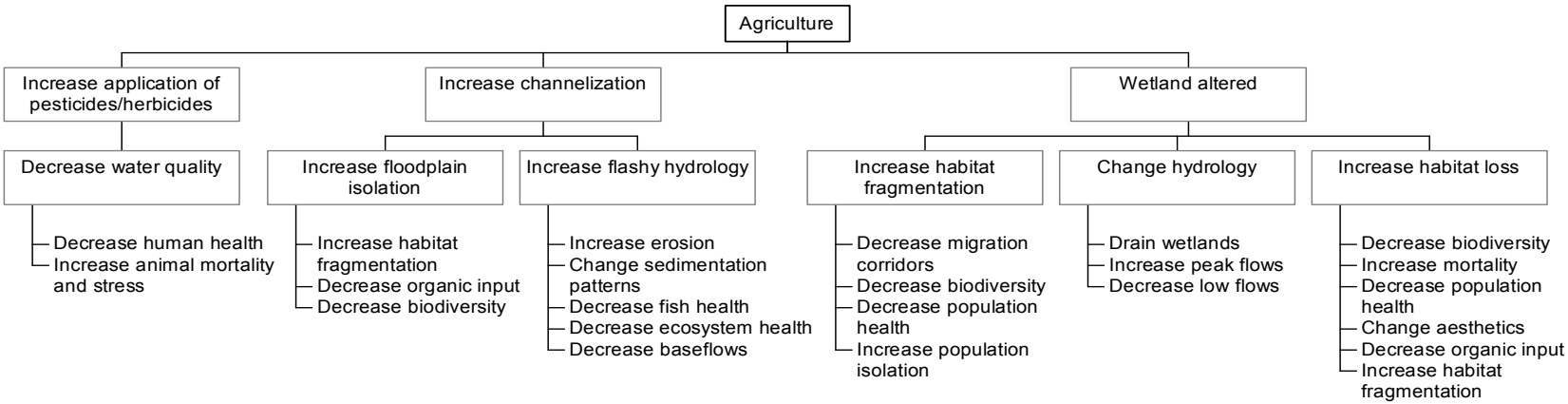

Figure 1. Potential cumulative impacts from agricultural activities

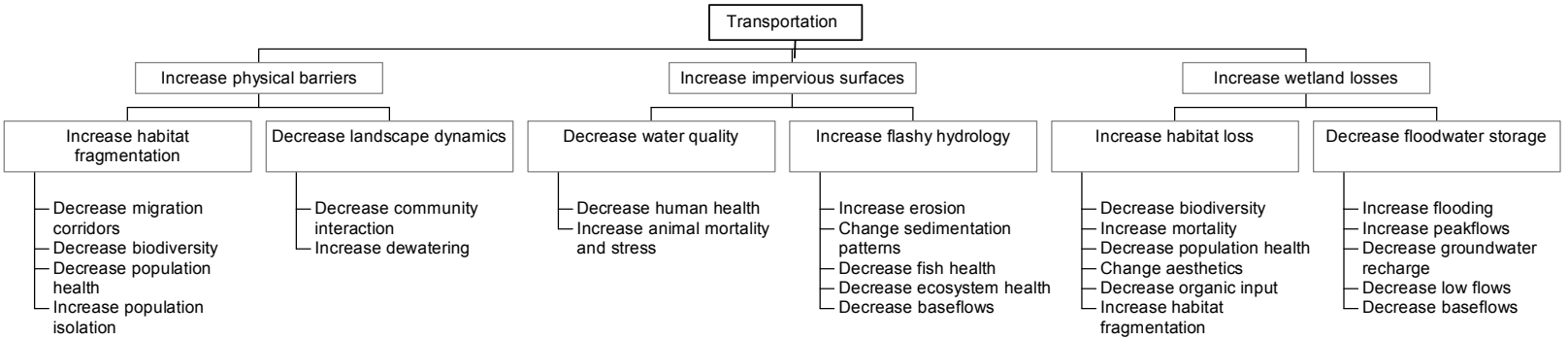

Figure 2. Potential cumulative impacts from transportation activities

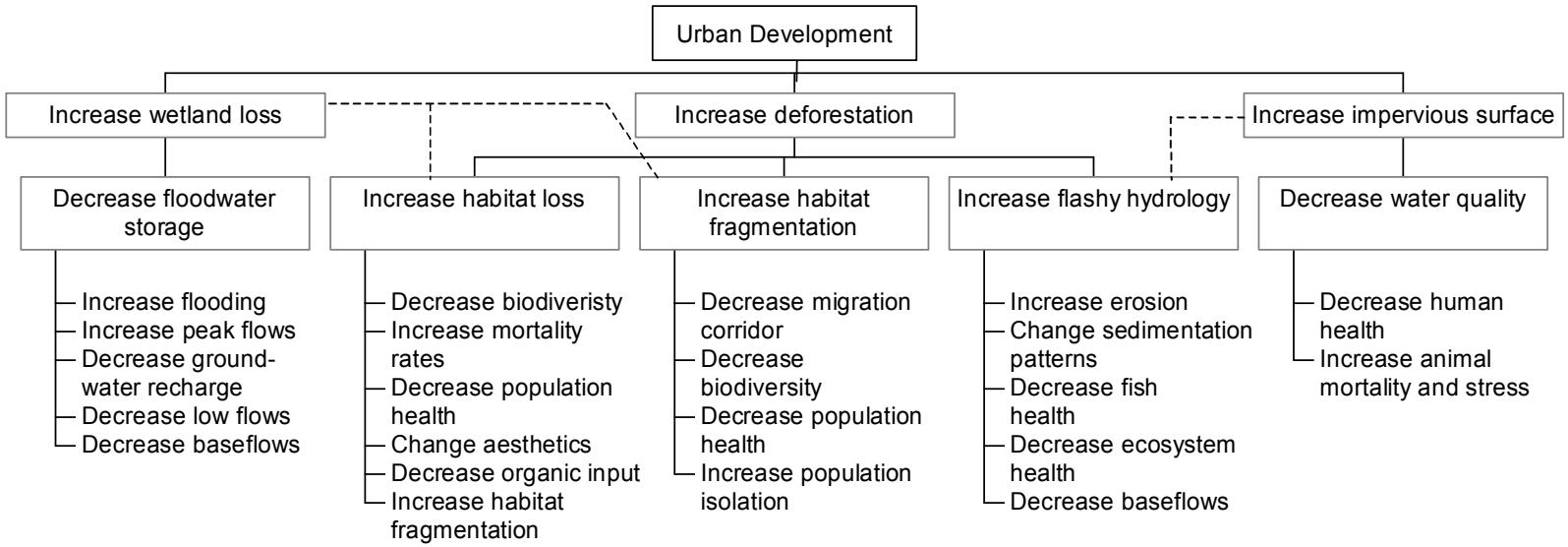

Figure 3. Potential cumulative impacts from urban development

Between 1936 and 1948 there was a substantial increase in urban development. Modern density subdivisions had been constructed as well as many new houses on larger plots of land. In addition, construction had begun on the airport. The primary impacts from the urban development were to increase the loss of wetlands, increase deforestation, and increase the amount of impervious surface. These changes served to continue the fragmentation of habitat, the adverse changes to water quality, the loss of habitats, and to increase the presence of flashy hydrology. In addition, the loss of the wetlands would have decreased the amount of floodwater storage area.

From 1948 to the present, the amount of urban development only continued to increase. By 1995, mixed urban development land uses made up 86% of Miller Creek, including Walker Creek, and 79% of Des Moines Creek watersheds.[27] In addition to the impacts from urban development discussed in the paragraph above, the additional roads caused impacts. By 1970, construction had begun on State Routes 509 and 518. The primary impacts from transportation structures are to increase the physical barriers, increase the amount of impervious surface, and increase the amount of wetland loss. The consequences of these functional changes are similar to those from urban development with the addition of a decrease in landscape dynamics.

A discussion of the consequences of these functional changes is as follows:

Decrease floodwater storage/Increase floodplain isolation. Generally, when wetlands associated with creeks are lost there is a decrease in floodwater storage capacity. There is also an increased isolation of the floodplains as the creeks are channelized or incised due to erosion. These two changes cause increased flooding and peak flows. Many of the wetland areas also serve as groundwater recharge areas, even if just for the shallow groundwater. Therefore, there is a corresponding decrease in low and base flows during the dryer months, especially the summer. The loss of interaction between the creeks and their floodplain also reduces the opportunity for organics to reach the creeks and contribute to the base of the aquatic food web.

There are no historic wetland inventories available to predict the amount of wetland acreage lost since 1936. However, review of soils surveys and aerial photographs can predict where wetlands might have been present. Tables 6 through 24 of the *Cumulative Impacts to Wetlands and Streams* (Port of Seattle, 2001b) describe the changes in the wetlands between 1936 and 1995. In summary, many small wetlands have been eliminated and some type of development has impacted most of the larger wetlands. Many of the changes to the wetlands were in areas adjacent to the creeks. Development encroached to the edge of the creeks, thus eliminating floodwater storage areas. The majority of the creek channels were either straightened or restricted in

[27] As documented in the Port's *Cumulative Impacts* report, these land uses include Industrial and Commercial, bare rock/concrete, City Center/Industrial, recently cleared, and high/medium/low-density residential. Data was compiled from the King County Geographic Information System data set based on 1995 Landsat satellite imagery.

some manner. All of these activities have decreased floodwater storage and increased floodplain isolation in the watersheds.

Decrease water quality. Water quality is adversely impacted when humans alter the natural landscape. The agricultural activities introduced pesticides, herbicides, and fertilizers into the systems. Development, including roads, added oils, grease, other petroleum products, other household and industrial toxics, sewage from septic systems, increased sediment levels, etc. to the stormwater runoff and/or groundwater. These changes can impact water quality. Adversely impacting the wetlands and other natural habitats can also decrease storage time and reduce shading that can increase temperatures and decrease dissolved oxygen levels. As a result, the aquatic species can be stressed or killed. Human health is also impacted if the contaminated species are eaten or if the aquifers providing drinking water are contaminated.

Both Miller and Des Moines creeks are classified as Class AA (extraordinary) waters by the State. However, there have occasionally been violations of water quality standards and Federal water quality criteria. Standards for pH, dissolved oxygen, ammonia, fecal coliform bacteria, total phosphorus, copper, lead, and zinc have occasionally been exceeded. These exceedances are typical for urbanized watersheds.

Increase flashy hydrology/Change hydrology. As a result of urban development and the increased amount of impervious surface, the efficiency or speed of water transmission is increased. There usually are also fewer channels to carry the water so the erosive forces in the remaining channels increases. These changes can also occur with agricultural activities, however, the degree of impacts is usually not as severe.

As a result of the increased velocities and volume, the cross-sectional area of the channels usually increases, a sign of increased erosion. This increases the amount of sediment in the system, as does the runoff from the impervious surfaces that also contain fines. These sediments are deposited in different places as the creeks try and reestablish equilibrium. In small drainage basins such as Miller, Walker, and Des Moines creeks, the result is typically more channel erosion than deposition. Therefore, the variety in the streambed composition and many of the gravel beds and bars are lost.

Another consequence of these changes is reduced storage of the runoff for release throughout the year. Therefore, low flows in the summer are reduced and water quality is adversely impacted. Baseflows are also not supported because the groundwater has not been recharged. Peak flows during floods are also higher and the peaks occur closer to the actual storm event.

All of these hydrological changes impact the health of the ecosystem, especially the fish. The quality of the fish habitat is changed as spawning gravel is lost, invertebrate communities are reduced, pools for holding and rearing are eliminated, water quality decreases, water quantity widely fluctuates, etc.

Miller, Walker, and Des Moines creeks have been extensively altered over time and all of these impacts have occurred. Most of the stormwater runoff in the mid and lower portions of Miller Creek is conveyed directly to the creek. Most of the upper reaches of Des Moines Creek are culverted or channelized. Increased volumes of stormwater flows and erosion and the subsequent destabilization of the creek channels have adversely affected fish populations in all three creeks.

Increase habitat fragmentation/Decrease landscape dynamics. As a result of development, habitats are lost and barriers are placed between the remaining habitats. The construction of transportation structures, highways in particular, greatly decrease the interaction of the various communities in the landscape. This causes the loss of migration corridors and isolates populations of various species, especially those with limited mobility. The increased isolation of species can lead to decreased diversity in the gene pool thus decreasing the long-term viability of the species and the overall population health. Elimination of many species relying on several different habitat types may also occur, as they cannot migrate between these habitats. The total number of different species supported is also diminished. Highways are also thought to greatly disrupt the hydrological conditions in a watershed and cause wetlands to change their hydrologic regime and increase sediment loading.

As described above, many of the major roads were constructed by 1936. However, these were narrow two lane roads at best and were largely unpaved. It was not until the 1970's when the highways were under construction that the major transportation impacts occurred. These roads, along with the urban development, served to isolate communities into smaller and smaller pockets and limited, even eliminated, most interaction between these pockets. The loss of wetlands and forested habitat has diminished the amphibian populations. Most large mammals were eliminated from the area by 1936. Only coyote and red fox remained for a time. Birds were not as impacted as they have the ability to disperse to other habitats outside of the watershed. However, the size of the bird populations and the number of species supported in the watersheds have diminished.

Increase habitat loss. All types of habitats, both uplands and wetlands, are lost as a result of agricultural activity or urban development. As a consequence, the species supported by these habitats are either killed or reduced in numbers and generally their population's overall health is decreased. This decreases the biodiversity both within a species and of the overall number of species in a given geographical area. Habitat fragmentation is also increased and the impacts are as discussed above. The loss of these vegetated habitats also has a great impact on the amount of organics available for food chain support in the system.

In addition, the aesthetics of an area are changed. Whether the aesthetics of an individual's surrounding environment has changed for the better or worse is a matter of personal opinion. Most individuals believe as the landscape changes to a more urban environment, the beauty of the world around them has decreased. However, the

inclusion of parks, landscaping, and other mitigation efforts to offset the development is often seen as beneficial.

As mentioned above, many of the smaller wetlands have been filled in the Miller, Walker, and Des Moines creek watersheds and most of the larger wetlands still present have been impacted by development. Many forested areas in the Miller, Walker, and Des Moines creek watersheds have also been eliminated initially due to agricultural activities and later urban development. As a result of these changes, large mammals have been effectively eliminated from these watersheds and small mammals are largely limited to coyotes, red fox, and household pets. The number of bird species has changed, as has the number of birds supported in the watersheds. Organic input into the food web has been greatly changed both in the source and quantity.

As for the aesthetics, in the Miller, Walker, and Des Moines creek watersheds, the area has become more urbanized with the addition of roads and vehicular traffic, higher populations, increased air and noise pollution, etc. However, some of the urbanization may have included the construction of architecturally pleasing buildings. However, many of the homes include extensive landscaping. There has also been a corresponding decrease in open spaces like forests and wetlands. Mitigation for the wetland impacts has been required for many projects.

In summary, the most important changes taking place in these watersheds since 1936 are:

- Loss and fragmentation of habitat, both uplands and wetlands
- Channelization of creeks
- Isolation of creeks from floodplains, especially the lost opportunity for organic input
- Substantial increase in the amount of impervious surface

(3) Existing Conditions. Using the four most important changes described above, the following discussion describes the existing conditions in these watersheds.

Habitat loss/fragmentation. The vast majority of the Miller, Walker, and Des Moines creek watersheds have been altered for commercial, residential, or airport and airport related developments. As stated earlier, by 1995, mixed urban development land uses made up 86% of Miller Creek, including Walker Creek, and 79% of Des Moines Creek watersheds. In Miller Creek, the remaining land covers are primarily deciduous/mixed forest (61%) or grass (26%). The largest concentrations of forest are located along Miller Creek below 1st Avenue S, the headwaters of Walker Creek in Wetland 43, and along the west slope and north end of the airport. In Des Moines Creek, deciduous/mixed forest (51%) and grass areas (39%) are also the most prevalent remaining land covers. The forested areas are along Des Moines Creek below S 200th Street in Des Moines Creek Park and in the proposed borrow areas. The large expanse of grass area is primarily at the Tyee Golf Course. Any remaining expanses of

habitat is scattered throughout the remainder of the basin. Therefore, except for the specific areas described, the habitat can be considered fragmented.

Creek channelization. The entire length of Miller Creek has been impacted in some manner. Residential development borders almost the entire length of the creek. The reach downstream of 1st Avenue S flows through an incised ravine and the houses are some distance away from the channel. Several of the roads crossing the creek have culverts acting as fish passage barriers.

For Walker Creek, SR 509 separates the very top of the headwaters from the rest of the creek. Wetland 43, downstream of SR 509, provides a large expanse of forested wetland in the headwaters of the creek. The remainder of the creek is fronted by residential and commercial development with limited riparian buffers.

The east branch of Des Moines Creek is predominantly underground in pipes and the west branch originates from the Northwest Ponds and flows through Tyee Golf Course. A large stretch of Des Moines Creek flows through Des Moines Creek Park but is paralleled by a service road and sewer line in places. The creek has been channelized at its mouth as it flows past the senior center.

Floodplains. The majority of the floodplains in the watersheds have been eliminated. The current conditions show that along Miller Creek, only Vacca Farms still supports some connection with the floodplain. In Des Moines Creek there is still a good connection to floodplains at the Tyee Golf Course.

Impervious surfaces. The amount of effective impervious area,[28] as estimated from 1994 aerial photographs, in Miller/Walker Creek is 1,071.31 acres or 18.8% of the watershed. For Des Moines Creek, there is 1,286.03 acres or 34.3% of the watershed.

(4) Proposed Project. As described in Paragraph 2 above, the proposed work within Corps jurisdiction includes the third runway, RSAs, SASA, Borrow Area 1 excavation, and mitigation work both on-site and at Auburn. Impacts to aquatic resources includes 19.62 acres of permanent and 28.78 acres of temporary impacts to wetlands, the realignment of 980 linear feet of Miller Creek, and the filling of 1,390 linear feet of drainage channels. The project will reduce the amount of wetlands in Miller Creek by 4%, Walker Creek by 3.3%, and Des Moines Creek by 3.8%. The proposed projects will add 106 acres of impervious surface in Miller Creek (2.4% increase), 5 acres in Walker Creek (0.8% increase), and 123 acres in Des Moines Creek (3.7% increase).

[28] Effective impervious area is the impervious area that actually drains to stormwater collection systems or surface water, thereby generating hydrological impacts. Impervious areas that direct stormwater away from collection systems to pervious land where infiltration occurs are not included in effective impervious area.

Appendix C describes the wetlands (Enclosure A), the functions (Paragraph 5 and Enclosure B), and the impacts (Paragraph 6, Enclosure C, and Table 1) in detail. Paragraph 9(A) and 9(B) above provide summaries of the potential wetlands, stream, and fish and wildlife impacts. The wetlands to be impacted by the proposed project include forested, scrub/shrub, emergent, and open water areas with several of the wetlands containing at least two different vegetation classes. The functions examined in these referenced sections include water quality (sediment, nutrient, heavy metal, toxic, and organics removal), hydrology (reduction of peak flows, decreasing erosion, groundwater recharge and discharge), and general habitat suitability (fish and amphibian habitat, aquatic food web conditions, invertebrate habitat, terrestrial bird, waterfowl, and other wildlife habitat, and native species richness). In summary, the Corps determined there would be impacts to all of these functions to various degrees throughout the project area. The functions of organic carbon export and habitat, and the issue of habitat connectivity were of particular concern in the landscape context.

Work has been completed for the temporary SR 509 Interchange. The interchange did not result in the loss of any wetlands. An MSE wall was constructed to minimize the footprint of the fill. The culverts under SR509 were replaced to ensure water from the headwaters of Walker Creek continues to feed the lower portions of the creek. Impacts included some vegetation removal and an increase in the amount of impervious surface.

(5) Proposed Mitigation. The Port has proposed mitigation to offset the potential physical, chemical, and biological impacts to wetlands and the streams and the species supported by these habitats as documented in the NRMP, *Comprehensive Stormwater Management Plan*, *Low Streamflow Analysis*, and the WHMP. A more detailed discussion of the compensatory mitigation can be found in Paragraph 10(A)(5) below and Appendix C. Additional discussion regarding stormwater and low flow can be found in Paragraphs 10(A)(6)(a) and (b) below. Discussion about wildlife concerns can be found in Paragraphs 9(B) above and 10(A)(10)(g) below.

In summary, the NRMP describes the compensatory mitigation voluntarily proposed by the Port to replace wetland and stream functions impacted by the proposal. The proposed mitigation includes wetland creation, restoration, and enhancement activities, stream enhancement in Miller Creek, riparian buffer enhancement in Miller and Des Moines creeks, replacement of drainage channels in the Miller Creek basin, and wetland restoration and enhancement at an off-site mitigation in Auburn. Appendix C describes the adequacy of the NRMP in Paragraphs 7 through 10. The Stormwater Plan addresses water quality and quantity impacts through the construction of detention ponds and vaults, implementation of treatment best management practices (BMPs) for new development, redevelopment, and retrofitted areas, and numerous actions to address water quality issues. The *Low Streamflow Analysis* addresses the potential low flow impacts through the construction of supplemental vaults so water can be released during the summer and early fall months to mitigate streamflow impacts. The WHMP emphasizes the identification and abatement of wildlife hazards within the airfield environment, including the wetlands.

(6) Foreseeable Future Projects. For the consideration of future actions, only those projects where "sufficient control and responsibility" exists should be considered (33 CFR 325, Appendix B 7(b)(2)). Factors to consider when making this determination include:

1. Whether the activity is just a link in a corridor project.
2. Whether aspects of the upland facility will affect the location and configuration of the regulated activity.
3. The extent to which the entire project is within Corps jurisdiction; and
4. The extent of cumulative Federal control and responsibility.

Based on these criteria, any projects requiring a Department of the Army permit and FAA approval should be considered. For those just requiring FAA approval, the MPU improvement projects in particular, a cumulative impact assessment has already been completed and can be found in the FEIS and FSEIS. In addition to the analysis completed by FAA, the Corps looked at these projects to determine the amount of impervious surface that would be added from the project. This is a key factor in determining potential impacts to the aquatic resources within Corps jurisdiction.

Projects potentially requiring a Department of the Army permit include the SR509/South Access road, Sound Transit Segment F, Des Moines Creek Regional Stormwater Detention Facility, the "L-shaped parcel" of the Air Cargo Development Plan (ACDP), and the EMT proposed conveyor belt. A summary of each potential project and the potential impacts are given below. A more detailed description of all these projects can be found in General Response 19 in the Response to Comments (Port of Seattle, 2001). Preliminary predicted aquatic resource impacts and possible increases to impervious surface for these projects are found in Table 2.

Table 2. Preliminary aquatic resource impacts for possible future projects requiring a Department of the Army Permit.

Project	Possible wetland/ open water impacts (ac)*	Possible Increase in Impervious surface (ac)	Watershed
SR509/South Access Road	7.7 – 9.29 0	60.5 1.9	Des Moines Miller
Sound Transit Segment F	0.79 0	6.2-11.2	Des Moines
Regional Stormwater Detention Facility	11 2,000 linear feet	0	Des Moines
L-Shaped parcel in the ACDP	0.05 ac wetland but no plans to alter	Unknown	Miller
EMT Conveyor Belt	2,800 sq ft eelgrass	0	Puget Sound

*Impacts include direct filling, grading, shading, and/or vegetation removal

SR 509/South Access Road. This project is being proposed by WSDOT and consists of an extension of SR 509 from its current southern termination point to I-5. The South Access road consists of a connection from this SR 509 extension to the STIA terminal drives. The current preferred alternative would impact up to 20 wetlands, four of which are associated with Des Moines Creek. The wetlands include forested, scrub-shrub, and emergent wetlands of varying quality. Impacts could result from the loss of the wetlands and the functions they support as well as from stormwater, water quality, and air and noise pollution from the vehicle traffic on the roads. Compensatory mitigation will be needed to offset these potential impacts.

Sound Transit Segment F. This portion of the Puget Sound Light Rail project would be an elevated line along Tukwila International Boulevard from S 152nd Street, connecting to the North Unit Terminal, and then continuing south to S 200th Street. Impacts include removal of trees in Washington Memorial Park, loss of one forested and palustrine emergent wetland, impacts to wetland buffers, and the possibility of some piers in open water areas. Loss of habitat and increased impervious surface would be the primary impacts. Compensatory mitigation would most likely be needed to offset these potential impacts.

Regional Stormwater Detention Facility. This portion of the Des Moines Creek Basin Plan is proposed to improve stormwater runoff management in the basin by providing 180 acre-feet of storage. The project includes the construction of one or two berms, regrading approximately 11 acres of wetland, reconstructing approximately 2,000 linear feet of existing Des Moines Creek channel, and the removal of two artificial weirs. The proposed wetland impacts consist of turf grass at the Tyee Golf Course, invasive scrub-shrub wetlands, and deciduous second growth forest. The functions of the impacted wetlands will change with the alterations to the plant community and changes to the hydroperiod. However, floodflow attenuation would be increased as a result and downstream areas would benefit from the stabilized flow regime. Improvements to the stream and fish habitat would also occur. Compensatory mitigation would likely be required for conversion of the vegetated wetlands to open water areas.

L-shaped parcel in the ACDP. The ACDP is a 10-year programmatic action to meet the needs of existing air cargo customers at STIA. The majority of the work will be the redevelopment of the north cargo area. Therefore, the majority of the work will not increase the amount of impervious surface. The portion of the plan that could impact wetlands and increase the amount of impervious surface is the development of the “L-shaped parcel” north of SR 518. A wetland delineation has not been performed but preliminary information indicates there are wetlands on the property. Impacts would be from the loss of wetlands and the increase in impervious surface.

EMT Conveyor Belt. This project is proposed by a private company and consists of the construction of a covered conveyor system north of the Des Moines Marina for transportation of large quantities of sand and gravel from barges in Puget Sound to an off-load site at STIA. The fill would be used for several proposed improvements identified in the MPU, including the proposed third runway. However, completion of the

proposed MPU updates does not rely on the construction of the conveyor belt. Therefore, the projects are considered to be separate projects. Work in Corps jurisdiction includes the construction of a 1,040-foot trestle and the temporary moorage of a 75-foot by 270-foot transfer barge. The covered conveyor system will be installed on the trestle. Shading of up to 2,800 square feet of eelgrass may occur due to the construction of the trestle. On the land, the conveyor is proposed to avoid wetlands by supporting the conveyor on piling. Impacts would primarily be the possible shading of the eelgrass from the temporary facility as well as the noise and aesthetic impacts from the conveyor belt.

FAA Approval Only. The list of projects requiring FAA approval but that will not impact any waters of the United States, including wetlands, include, but are not limited to, the City of SeaTac City Center Plan, South SeaTac Electrical Substation Upgrade, South Terminal Expansion, Upgrade of Airport Satellite Transit System, IWS Lagoon #3, portions of the ACDP, Aircraft Hydrant Fueling System (AHFS), Part 150 Noise Compatibility Plan, North Electrical Substation, Water System Improvements, Airport Surface Detection Equipment, Temporary Aircraft Parking-Taxiway Stubs, and TRACON. As mentioned above, the FAA in the FEIS and FSEIS has prepared a cumulative impact assessment. The Corps focused on possible increases to impervious surfaces. Table 3 summarizes the potential increases to impervious surfaces as a result of the projects.

Table 3. Increase in Impervious Surface from projects not requiring a Department of the Army permit.[29]

Project	Possible Increase in Impervious Surface (ac)	Watershed
City Center Plan	0	Des Moines & Miller
South SeaTac Electrical Substation Upgrade	0	Des Moines
South Terminal Expansion	0	IWS
Upgrade Satellite Transit System	0 (all underground)	IWS
IWS Lagoon #3	7.7 ac (lining of existing ponds)	Des Moines
Portions of ACDP	12 ac	Miller and Green River
AHFS	0	Des Moines
Part 150 Noise Compatibility Plan	Likely to remove impervious surface	Des Moines & Miller
North Electrical Substation	0	Miller
Water System	0	Gilliam
ASDE	0	Miller
Temporary Airport Parking	3.4	Des Moines & Walker
TRACON	4.7	Miller
Borrow Areas 3 and 4	0	Des Moines

(7) Conclusions. The watersheds of Miller, Walker, and Des Moines Creek have been impacted by urban development, including major transportation projects. These impacts are fairly typical for urban watersheds. Mitigation for many of the past impacts was not required at the time because of the lack of environmental and land use laws. However, for the proposed project, the Port is required to provide mitigation to offset both the specific and cumulative impacts and is proposing:

- Restoring, creating, and enhancing both wetland and upland habitats on-site. This mitigation is concentrated along Miller and Des Moines creeks to maintain habitat connectivity, in part.
- Providing additional habitat mitigation off-site for birds, a more mobile species. This site is adjacent to the Green River and provides also connectivity between various habitats.

[29] The determination of no Corps permit required is based on the current information available regarding these projects and is not necessarily the final Corps position.

- Realigning and/or enhancing various portions of Miller Creek, thus reversing some of the past channelization impacts.
- Recreating floodplains at Vacca Farms hydrologically connected to Miller Creek.
- Increasing opportunity for organic input by locating other portions of the mitigation, the Des Moines Nursery site and Wetland A17 in particular, adjacent to and connected with Miller Creek.
- Providing mitigation for the increased amount of impervious surface through the Comprehensive Stormwater Management Plan.

Therefore, while the proposed project and mitigation does not reverse the past adverse impacts having occurred in these watersheds, it does not further contribute to the degradation of the aquatic environment, except for passerine bird and waterfowl habitat. Mitigation for these impacts are provided at the off-site mitigation in Auburn.

T. Other Factors Considered. Four issues in particular were raised by the public during the application review process and are discussed in more detail below.

(1) MSE Walls. Several individuals and the opposition groups have raised concerns regarding the integrity of the MSE walls in an earthquake. The Corps evaluated these concerns and requested additional information regarding the design and testing of the wall design and performed an independent review of the Port's information.

(a) Impact. MSE walls are proposed along three areas of the embankment fill and range from 50 to 135 feet in maximum height. The walls are located at the north end of the proposed new runway, around Wetland 18/37a where Miller Creek is closest to the proposed fill, and around Wetland 44a in the headwaters of Walker Creek. The walls are part of the proposed embankment design minimizing the footprint of the fill in wetlands and Miller Creek.

If any of the walls were to fail in an earthquake, there is a potential for the fill material behind the walls to slough into Miller Creek or adjacent wetlands. Also, depending upon the severity of the earthquake, the cohesiveness of the fill, and the location of the failure, the material could spread further than the adjacent creek and wetlands.

(b) Mitigation. The Port has performed extensive reviews of the proposed MSE walls to minimize the potential for failure in an earthquake. Documentation of these steps can be found in *Geotechnical Summary Report, Third Runway Embankment and MSE Retaining Walls, Seattle-Tacoma International Airport* (Hart Crowser, 2001). In summary, the Port has adopted seismic performance goals in accordance with the American Association of State Highways and Transportation Officials (AASHTO) numeric factors of safety. Throughout the process a review board of internationally recognized experts have been reviewing the proposals and making recommendations for implementing additional tests and analyses to improve the design. Specific performance goals of the MSE wall for the design level of shaking include:

- The MSE walls and embankment fill will remain stable. Some deformations are acceptable (up to a few feet) provided the stresses in the retaining wall materials are typically below the value allowed by the AASHTO code.

- There will be no wetland or creek impacts due to seismic shaking of the embankment or MSE walls.

- There will be no operational impacts to the new runway related to movement of the embankment slopes and walls during an earthquake.

To fulfill these goals, the Port plans to do subgrade improvements for the areas containing soft or loose soils affecting stability or deformation. The Port examined several alternatives and chose to remove and replace the unsuitable soils with compacted structural fill.

(c) Findings. As documented in the memorandum titled *Geotechnical Review – MSE Walls and Embankment* (Corps 12 August 2002), the Corps has independently reviewed the design of the MSE walls and has determined the engineering services contracted by the Port are highly qualified, the design is being done in accordance with accepted and proven engineering procedures, methods and analyses of the design meet and/or exceed the necessary codes and guidance, and the Port is utilizing an independent technical review board of highly recognized and qualified experts to review the design and testing. Therefore, I have determined the Port has taken the necessary precautions to minimize the potential failure of the MSE walls.

(2) On-Site Borrow Sources. The Port plans on excavating 6.1 million cubic yards of material from three borrow areas south of the airport. Several individuals raised concerns about the potential indirect impacts from excavating these borrow areas. A few individuals also raised concerns regarding the potential for the soils to be contaminated with arsenic. Others were concerned about future development plans at the sites.

The Corps also had questions about the potential indirect impacts and performed an independent review of this issue. Ecology is the lead agency for defining the fill criteria and has addressed the concerns regarding arsenic contamination. Paragraphs 10(A)(7) and 10(A)(10)(h) below provide additional discussion regarding fill criteria and indirect impacts. Appendices B and C also contain discussions regarding the borrow areas.

(a) Impacts. The three borrow areas are all vegetated with a mixture of second growth deciduous and coniferous forests. The dominant vegetation is a mixture of Douglas Fir, Western Red Cedar, alder, cottonwood, ferns, salal, English ivy, and grasses. All of this vegetation will be removed with the exception of a 50-foot buffer along the property lines. All three borrow areas are former residential areas with the houses removed but the roads remaining. Borrow Area 1 is 116 acres in size with 5.66 acres of primarily forested and scrub-shrub wetlands. The footprint of the excavation is approximately 89

acre, 1.03 acres of which are wetlands being impacted. Borrow Area 3 is 60 acres in size with 2.5 acres of wetlands. The footprint of the excavation is 23 acres with all of the wetlands being avoided. Borrow Area 4 is 40 acres in size with no wetlands. The footprint of the excavation is 34 acres. There will also be 0.07 of an acre of wetland impacts for the construction of a haul road. All of the borrow areas eventually drain to Des Moines Creek which also forms the western border of Borrow Area 1. The maximum excavation depth will vary from 30 to 70 feet below the existing ground surface with the base of the borrow excavations intended to be a maximum of 10 feet above the water table.

The potential impacts from the excavation will be from short-term water quality impacts and long-term impacts from vegetation removal and changes to water pathways. The surficial soils contaminated with trace amounts of windblown arsenic from the ASARCO Tacoma Smelter will also be disturbed.

At this time the Port does not have any plans for redevelopment of the borrow areas. However, they do have an agreement with the city of SeaTac to pursue such redevelopment. If plans are developed in the future, the applicable permits will be obtained.

***(b) Mitigation*.** Stormwater management and temporary erosion and sediment control facilities will be installed prior to site development to minimize water quality concerns. To minimize potential noise impacts from the excavation activities, the existing vegetation in the 50-foot buffer along the perimeter of the borrow areas will be maintained. If there are no trees existing, an earthen berm maybe constructed. After excavation is completed, the borrow areas will be graded to a 1.5 percent grade and revegetated with grass and other herbaceous ground cover. A grass mixture producing small or no seeds, but still able to generate new growth or re-seed itself will be used. To minimize the impacts to wetlands in Borrow Area 3, a 50-foot buffer will protect them and a drainage swale will be constructed along the face of the excavation slope to conduct groundwater seepage and runoff to wetlands. The wetlands to be avoided in Borrow Area 1 will also have 50-foot buffers.

The Port has developed a topsoil management plan to address the arsenic concerns. The upper 12-inches of topsoil would be temporarily stockpiled and then reused as part of the reclamation plan. The subsurface soils to be used a fill material would need to meet the fill criteria as designated by Ecology.[30]

***(c) Findings*.** I have independently reviewed the Port's protective measures for the wetlands within and adjacent to the borrow areas and they appear to be reasonable. Therefore, I have determined the potential indirect impacts to the wetlands are minimal and no additional mitigation is required. As for the concerns about arsenic

[30] The fill would also have to meet the PCHB conditions unless the Port's and Ecology's appeals result in a change to the PCHB conditions.

contaminated soils, Ecology is the agency with primary responsibility regarding this concern and will address any concerns through their Toxics Cleanup Program and the newly created Area-Wide Soil Contamination Task Force established to address the smelter contamination plume. Further, the Port has prepared a *Topsoil Management Plan* for handling any smelter-impacted topsoil.

Regarding possible future development in the borrow areas, there are no reasonably foreseeable future projects planned for the borrow areas. If the Port develops plans in the future, if wetlands or other waters of the United States will be impacted, then coordination with the Corps will be necessary.

(3) Noise. Noise in the project vicinity is generated by normal daily activities such as lawn mowers, air conditioner compressors, outdoor residential activities, etc. and transportation noise related to aircraft, railroads, and vehicular traffic. Concerns have been raised primarily by the individuals living in the areas about health impacts from the noise and the adequacy of the Port's Part 150 Noise Compatibility Plan. Additional discussion regarding noise pollution can be found in Paragraph 10(A)(10)(b) below. The FAA's analyzed noise impacts in the FEIS and FSEIS.

***(a) Impact*.** Impacts from noise pollution include possible loss of hearing, reduced mental and emotional health, sleep disturbance, interruption of outdoor activities, interference in the ability to teach in schools, and decreasing property values. Numerous studies have been performed to try and quantify these impacts and they are discussed in the FEIS in Chapter IV, Sections 2 and 7. The Port has determined the proposed project will affect about 4% more people with noise exposure levels of 65 Day-Night Average Sound Level (DNL) or greater in the years 2010 and 2020 as compared to the Do-Nothing alternative. There would be a significant change in noise levels (1.5 DNL or greater) for three schools or educational facilities.

***(b) Mitigation*.** There will be a reduction in noise in the future as a result of the noisier Stage 2 aircraft being replaced by the quieter Stage 3 aircraft. The Port is also implementing a Noise Remedy Program that includes noise insulation, transaction assistance, acquisition, and relocation efforts.

***(c) Findings*.** The FAA has the authority to regulate airport noise. I have reviewed the information presented in the NEPA documents and do not find any reason to disagree with FAA's ROD findings regarding noise. Therefore, no further review or mitigation by the Corps is necessary.

(4) Air Quality. On 30 November 1993, the EPA published its final General Conformity Rule for implementing Section 176(c) of the CAA. This rule addresses how Federal agencies must demonstrate that activities in which they engage conform with applicable, Federally approved CAA SIPs. For the Corps' regulatory program, this analysis is limited to "the part, portion, or phase of the non-Federal undertaking that

requires the Federal permit, license, or approval."[31] The Corps uses a narrow scope of analysis in determining what portions of the non-Federal project they will review. For example, "the [Corps] is not responsible for evaluating all emissions from the later phases of the overall office development (the construction, operation, and use of the office building itself), because later phases generally are not within the [Corps'] continuing program responsibility and generally cannot be practicably controlled by the [Corps]."[32] Therefore, for the purpose of this project, the Corps' analysis is limited to the construction activities associated with the impacts to the waters of the U.S., including wetlands, and not the operation and use of the new third runway.

The FAA must also comply with the same provisions of the CAA and has completed a General Conformity analysis. The scope of their analysis includes both the construction of the MPU projects and the operation and use of the new facilities. As a result of their General Conformity analysis, the FAA determined the potential emissions do not exceed the *de minimis* thresholds and therefore a formal air conformity determination would not be required. However, because of the size and visibility of the projects, the FAA also performed a conformity analysis for compliance with the SIP and they determined the proposed emissions do not exceed the established limits.

(a) Impacts. Air quality associated with the STIA are of concern to FAA and the residents of the area because of the emissions produced by both the airplanes and vehicles during operations, travel to and from the airport by passengers and workers, and vehicular traffic associated with the construction of the proposed projects. The pollutants produced both by airplanes and vehicles of particular concern include carbon monoxide (CO), nitrous oxides (NO_x), and volatile organic compounds (VOC) because they are the precursors to the formation of ozone. Particulate matter (PM_{10}) associated with the airplanes is also of concern. However, the FAA has determined the results of engine testing for particulate matter emissions from airplanes used in earlier versions of the Emissions and Dispersion Modeling System (EDMS) computer model are not accurate and cannot be used. The FAA also does not allow the use of the FAA Aircraft Engine Emission Database (FAEED) computer model. The FAA has not updated the particulate data because no reliable data on aircraft particulate emissions is available.

(b) Mitigation. The NO_x and CO levels are of particular concern during construction because of emissions from the construction equipment, trucks hauling fill in particular. The Port recalculates potential emissions every year with proposed construction and adjusts the amount of construction allowed to stay below the *de minimis* levels.

(c) Findings. Based on the Corps' review of the information provided regarding air conformity and the *de minimis* determination, we concur with the analysis performed by the FAA. As stated in Paragraph 7(C) above, the EPA, PSAPCA, Ecology, and the State of Washington also all agree with the *de minimis* determination.

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[31] 58 *Federal Register* 63248 (30 November 1993).
[32] 58 *Federal Register* 63227 (30 November 1993).

(5) Construction Impacts. Construction related impacts could include air and noise pollution and disruption of transportation patterns. Opposition groups and/or individuals have raised concerns for all three of these potential impacts. The Corps reviewed the FAA's analysis as presented in the NEPA documents for these construction related impacts. Additional discussion regarding noise pollution and air quality can be found in Paragraphs 9(T)(3) and 9(T)(4) above.

(a) Impact. Potential air quality impacts related to construction include vehicular emissions and fugitive dust raised from excavation and filling activities. The diesel trucks used for hauling the fill material will produce substantial CO emissions. Modeling along the haul routes showed the CO concentrations will be equal to or slightly above the Do-Nothing conditions but will still be below the ambient air quality standards. Fugitive dust emissions will be generated, especially during dry conditions, from truck traffic stirring dust already on the road and heavy equipment operations in the fill and borrow sites. Modeling along the haul routes show particulate emissions could be above the standards if mitigation or control measures are not implemented.

Potential noise impacts will be from the operation of the construction equipment. The noise levels from the operation of the equipment are generally higher than those generated by normal surface traffic flows. Increases in the peak hour average sound level are estimated to be between 3.6 and 7.4 decibels A-weighted (dBA) depending upon the location.

Off airport hauling from off-site sources will affect the traffic on freeways, highways, arterials, and permitted local streets used for hauling. The degradation of service would be substantial if hauling occurs in congested areas during peak travel times. On-site source material may also impact some of the local roads for access. Chapter IV, Section 23 of the FEIS describes the potential impacts at various intersections in the project vicinity.

(b) Mitigation. To minimize the amounts of fugitive dust emissions the loads will either be covered or watered down, vehicles will be cleaned prior to leaving the construction site, paved roads will be swept or washed with water, unpaved roads and the inactive portions of the construction sites will be watered to reduce dust emissions.

To minimize the noise, the Port will develop a Construction and Earthwork Management Plan to minimize the nighttime noise impacts on noise sensitive facilities adjacent to the haul routes.

Mitigation for transportation impacts could include the use of barges, trains, and/or conveyor belt systems. Contractors bidding on the work could propose any of these options but would be required to obtain any of the necessary permits. Therefore, the worst-case scenario of just using trucks was assessed. Mitigation to reduce the traffic impacts could include scheduling the trips during non-peak traffic times, changing the signal timing, and adding new signals at some intersections.

***(c) Findings*.** I have reviewed the FAA's analysis as presented in the NEPA documents and do not find any reason to disagree with FAA's findings. Therefore, no further review or mitigation by the Corps is necessary.

10. Coordination. Coordination for this proposed project was performed in accordance with the procedures specified in 33 CFR, Parts 320-330 (Corps Permit Regulations). As described in Paragraph 8 above, as part of this coordination, the proposed work was circulated three separate times for public comment on 19 December 1997, 30 September 1999, and 27 December 2000. In addition, the Corps and Ecology held three separate public hearings jointly on 9 April 1998, 3 November 1999, and 26/27 January 2001.

This section summarizes the comments received throughout the process and up until the permit decision was made. However, for comments received on the first two public notices and public hearings, only those issues not resolved through subsequent modifications to the proposal are summarized. For example, comments received on the initial drafts of the NRMP were not addressed as a revised mitigation plan was later submitted and separate comments were received. Sources for comments in this section were Federal, State, and local agencies, Native American Tribes, elected officials, business groups and businesses, environmental groups and societies, organized opposition groups, private citizens, etc.

Many of the comments received during the processing of the application expressed concerns about the same issues. Interested individuals and organizations submitting comments on the proposed project comprised the majority of the comments received from over 700 different people submitting letters, many of who sent in multiple letters. About 85% of the commentors were opposed to the project and expressed similar, general concerns over the proposed project. To avoid repetition in responding to many of the same issues contained in the comments, discussions of similar issues of concern were grouped together by topic and one response was prepared. Appendix A contains a table cross-referencing the name of the individual/group commenting and in which paragraph their comments are addressed. Comments received from certain Federal, tribal, and state agencies are addressed individually after the grouped responses.

The Port provided responses to the comments received after the three separate comment periods. These responses were used to help address the comments. However, additional comments were received outside of the official comment period. While they were forwarded to the Port and these comments were considered in the Corps' evaluation of the project, the Port may not have chosen to provide responses. Applicants are provided the opportunity to provide responses but such responses are not mandatory. Therefore, the section titled "Applicant's Response" may not address all of the comments summarized for the particular subparagraphs.

The following points are considered pertinent in evaluation of comments received in response to the public notices and public hearings. Each comment is followed by the Applicant's Response and the District Engineer's Response.

A. Grouped Issues of Concern

(1) Denial of permit. Over 500 private citizens, organizations, and business groups requested denial of the permit. Issues of concern included many of those discussed in more detail in Paragraphs 10(A)(3) through (13) below. In summary, some of the reasons raised for denial included:

- How much more can the community take – earthquake, pollution, the wall
- Airplanes almost crash or drop parts in our school fields.
- Cannot build any further at SeaTac airport without severely damaging the surrounding environment. Mitigation is not sufficient.
- Proposed project is speculative and poor use of US tax revenues, still haven't completed noise mitigation measures at schools, and poor environmental stewardship.
- Deny the permit – complete an objective and honest review of the need for the runway. Port still has not provided adequate information.
- It would be irresponsible to build an airport already rated as 6th in U.S. for incursions, to increase ground traffic in an area rated as 3rd most congested, incur such high construction costs, to build too short of a runway, to increase respiratory illness and cancer rates, to dump more toxics which will kill orcas, and to destroy what little is left in watershed including salmon bearing streams.
- Cost estimates are incorrect and skyrocketing out of control.
- It is a matter of environmental justice.
- The individual and cumulative impacts more than minimal, it is detrimental to the safety and public interest, and it does not pass alternatives analysis.
- More time is needed to be able to review all the information provided, and still needing to be provided, by the Port.
- The Port has not demonstrated the need for another runway.
- "Reasonable assurance" from the Port of Seattle is a contradiction in terms. They have yet to complete mitigation for the impacts of the second runway.
- The Port needs to conform to the same standards as other recent applications for 404 permits. In particular, the Corps recently denied the permit for the landfill in Pierce County. The Corps should use the same standards and deny this permit application.
- The Port's money should not be used to hire people to expedite issuance of their permit, which should be denied anyway.
- Fear of threat from anti-aircraft missiles in addition to the high costs make this project not in the public interest.

Applicant's Response. The Port has always been clear articulating the need for the project. No levy tax dollars are used for the Airport. The FAA has determined that no one sector of the community measured by race, income, religion, or age would be disproportionately affected by displacements or impacts that would occur as a result of the proposed project. The proposed mitigation is reasonable and it compensates for the proposed impacts.

District Engineer's Response. I also had questions regarding the need for the project, the assessment of the potential impacts, and the adequacy of the proposed compensatory mitigation. Therefore, I have throughout the decision-making process asked for additional information from both the Port and FAA to ensure all of my questions and concerns have been addressed. I also completed an independent review of the need for the proposed project, the alternatives, the potential impacts, the proposed mitigation, compliance with other applicable laws, etc. as documented in this ROD and Appendices B and C. After reviewing all of the available information, I have determined the proposed project with special conditions is the least environmentally damaging practicable alternative, the proposed mitigation adequately compensates for the proposed impacts, and the project is in compliance with the other laws for which the Corps is responsible and is not contrary to the public interest. Therefore, I found no reason to deny the permit.

(2) Support of Permit Issuance. Over 100 comments were received in support of the construction of the third runway because of its importance to the economic well being of the State of Washington. Specifically, people supported the proposed project as they believed it is critical to the future and stability of the hotel industry, is important to the region to meet the future transportation needs, and supports the tourism industry in the Pacific Northwest. Furthermore, the business generated by the visitors arriving via STIA and the international trade is supported by both the passenger and cargo facilities at STIA and are important to the economy of Greater Seattle. They believe timely and convenient air service is needed to ensure the region can compete in the global economy. Several people also believed the mitigation proposed is very responsible from an environmental point of view.

A few people believed an independent review of the Port's environmental documents showed they are well thought-out and meet or exceed all of the requirements needed to make a determination for the 404 permit. They also believed the mitigation and monitoring plans are very detailed and can be used to achieve desired mitigation objectives for the project.

Other comments acknowledged there is no question the Port is a difficult neighbor to live with and there will be problems during construction, and the trucking of the fill material will disrupt lives and temporarily impact the quality of the lives of those living in the neighborhood. However, they also believed the proposal has been the subject of numerous studies and money is being wasted by continuing to study a project which needs to be built. They concluded mitigation is better than litigation.

Applicant's Response. Comments in support of the proposed project are noted.

District Engineer's Response. Comments in support of the permit were noted. The Corps was a cooperating agency for the EIS process that analyzed the need, impacts, and benefits of the proposed project. I also prepared an independent analysis of the proposed project purpose and need (see Appendix B) and of the potential impacts and the adequacy of the proposed mitigation (see Appendix C). I have determined

issuance of the permit with special conditions is not contrary to the public interest and is in compliance with the applicable Federal, State, and local laws and regulations.

(3) Mechanically Stabilized Earth (MSE) Walls. Over 80 comments were received regarding the MSE Walls. These concerns have been broken down into four categories: design concerns, integrity in an earthquake, microclimate concerns, and aerodynamic concerns.

***(a) Design Concerns*.** Most of the concerns raised regarding the design process were about the adequacy of the field and laboratory tests. These concerns included:

- Making sure "appropriate" foundation soils are in place.
- A geotechnical engineering investigation needs to be completed.
- There are significant deficiencies in the field and laboratory investigation so there is not sufficient information to conclude that the project as conceived could withstand the static and seismic loads it will be subject to over its lifetime.
- Only the minimum level of soil strength testing has been performed. More testing including increased spatial distribution of testing and sufficient tests within a given soil layer to provide redundancy in the testing results is needed. The laboratory strength tests that have been performed are being interpreted in a manner resulting in higher strengths than would typically be used in engineering practices. Given the unprecedented scale and the critical nature of the project, it is important that testing be performed to properly account for the true field conditions.
- The necessary strength testing under the appropriate testing conditions need to be performed prior to the completion of significant design work.
- The use of hollow stem auger drilling techniques for obtaining blow counts in sandy soils below the water table is not appropriate and can lead to erroneous results, particularly in loose soils.
- Given the unprecedented height of the West MSE Wall, it is considered prudent to plan for installation of instrumentation behind the wall face and in the backfill to monitor for deformations both during construction and at repeated intervals during the lifetime of the wall.

The other design issues raised include:

- Make sure complete design drawings have been provided for approval. A permit should not be granted before the design work is completed.
- Insufficient information regarding the wall design has been provided for public review.
- Why is there a downward slope from the runway to the top of the wall? Won't that "pull" errant planes off of the "cliff"?
- What is planned for the tiers between the wall sections?
- Is there sufficient structural experience with MSE walls of this size?
- Use of the Hydrologic Evaluation of Landfill Performance (HELP) model for the estimation of groundwater and creek recharge after construction of the runway

embankment may result in underestimation of subdrain capacity, leading to a potentially destabilizing buildup of water in the subdrain.

Applicant's Response. The Port's design team has taken a conservative approach in selecting design strength values of soils from results of both the laboratory and field tests. Actual design is based on more than 90 subsurface borings, cone penetrometer soundings and test pits, as well as an extensive series of *in situ* and laboratory soils tests. The exploration and test program generally conforms to standards for design of MSE walls published by the Federal Highways Administration (FHWA) and the code developed by AASHTO. The Port stated their testing used the procedures in both American Society for Testing and Materials (ASTM) D 2850 and ASTM D-4767. The Port believes the test results demonstrate the soil can tolerate large deformations without failure and any increase in strength means it will further limit deformations. Higher pressures were not used in the preliminary triaxial tests because of a limitation in the capacity of testing equipment, but the Port states this testing will be completed as part of final design. The Port recognizes the potential issues raised regarding hollow stem auger techniques but notes that any potential error of the type suggested would produce conservative results, i.e. it would always tend to make soils seem more susceptible to liquefaction than they actually are. Therefore, the Port believes the support for the MSE wall foundations will be dense and unyielding.

The Port agrees monitoring should occur during construction and final plans will be developed by the wall designer subject to review and concurrence by other members of the design team. Construction monitoring will generally include vertical deformation of the wall subgrade soils, horizontal deformation of the wall subgrade soils, horizontal deformation of the reinforced wall backfill, horizontal and vertical movement of the wall face, various quality control tests and quality assurance procedures, etc. However, monitoring is not proposed post-construction unless a seismic event occurs which would warrant an examination.

The Port states the sloping ground behind the MSE wall is designed as a surcharge load to the wall as recommended by the AASHTO.

The HELP model was used by the Port to simulate flow through different parts of the embankment, including the lateral drainage layer at the base of the embankment. The Port understands the concerns regarding the use of the HELP model and the hydrologic analysis has included several different models to analyze different aspects of the effect of the embankment on infiltration and groundwater recharge.

Several consultants for the Port provided comments regarding the technical review process followed for the designing of the MSE walls. They stated the review included examining alternatives, review of existing MSE walls, and technical review of design criteria by established MSE wall experts.

District Engineer's Response. I also had questions about the design and the review and testing processes for the MSE walls. Therefore, I asked the Port for additional

information regarding these issues, which they provided. For publication of the public notice, "detailed engineering plans and specifications are not required" (33 CFR 325.1(d)). "In addition to the information indicated in paragraph (d) of this section, the applicant will be required to furnish only such additional information as the district engineer deems essential to make a public interest determination" (33 CFR 325.1(e)). Therefore, design drawings at the 100% complete level are not necessary to be able to complete the public interest review and permit decision. Based on my independent review of the information, I believe the MSE walls have been sufficiently designed so I can adequately evaluate the design.

Based on my independent review of the MSE wall design, I have determined the engineering services contracted by the Port are highly qualified, the design is being done in accordance with accepted and proven engineering procedures, methods and analyses of the design meet and/or exceed the necessary codes and guidance, and the Port is utilizing an independent technical review board of highly recognized and qualified experts to review the design and testing (Corps, 12 August 2002). Therefore, I have determined the Port has taken the necessary precautions to minimize the potential failure of the MSE walls.

(b) Integrity in an Earthquake. Many comments were received regarding the stability of the MSE walls during earthquakes, especially because of the recent Nisqually event on 28 February 2001. They expressed concern because a MSE wall of this height has never been built and similar walls nearing this height have never been subject to strong seismic events. Several people pointed out damage to two walls during the earthquake, in Tumwater and the north end of Terminal 5 at the Port of Seattle in the Duwamish Waterway, shows the need to perform additional testing. Many believed another supplemental EIS is needed to properly analyze the potential impacts. They also believed the Section 404(b)(1) Evaluation needs to evaluate the safety factors related to the walls including reviewing detailed soils and design data and seismic and liquefaction analyses. Several people also requested the Corps inspect the area surrounding the airport for earthquake damage.

Specific comments regarding the tests already performed included:

- The Port should have more than a simple pseudo-static analysis performed (may seriously overestimate the ability of the wall to withstand seismic loads).
- The stability analyses performed to date continue to overestimate the resistance of the wall to seismic loading. The likely solution will be to expand the zone of soil improvement and ensure that the depth of improvement is sufficient to cut off any potential failure surface below the improved zone.
- The seismic standards used need to be in excess of those associated with ordinary residential structures. The computer program Fast Lagrangian Analysis of Continua (FLAC) is not known to reliably predict seismic deformations of earth structures. The analysis should be "benchmarked" by comparison to physical model tests, well-documented case histories, or closed form solutions.

- The liquefaction analysis is flawed, as the Port is not applying the Chinese Criterion appropriately. These criteria were developed for evaluation of materials that are potentially liquefiable, not for identification of materials that are not liquefiable.
- The inconsistencies between the magnitudes used in the Probabilistic Seismic Hazard Analysis (PSHA) and the acceleration response spectra casts suspicion upon the results of the analysis.
- Without knowing the details of the time histories used in the analysis, including how the acceleration response spectra compare to the target spectrum, it is impossible to say whether or not analyses are being performed properly or not.

Applicant's Response. The Port believes the appropriateness of their analysis is confirmed in the geotechnical engineering literature. The Port believes there is no theoretical justification or code requirement justifying the need to search for the critical failure surface independently of the static analysis. Searching for a critical surface with the pseudo-static acceleration component included in the search is unreasonably overly-conservative and is not required by design standards such as the code developed for the design of MSE walls by the AASHTO and FHWA. The Port states the proposed subgrade improvement zones below each MSE wall was designed to provide a stable buttress assuming that there could be some zones of liquefaction or other weak soils below the embankment that are outside the zone of subgrade improvement.

The Port also believes the engineering literature demonstrates the extensive use of FLAC for dynamic analysis of earthen structures, including comparisons with real earthquakes. In particular, University of Washington research demonstrated the reasonableness of FLAC analyses for seismic analysis of MSE walls based on comparison with shaking table and centrifuge test results. However, FLAC is only one of several tools used by the Port's design team to evaluate the seismic response of the MSE walls.

The Port believes the inconsistencies in the PSHA asserted to exist are not within the PSHA itself, but represent different assumptions used in the PSHA vs. the liquefaction analysis. The Port's PSHA did not limit consideration of progressively larger events to the subduction zone.

The Port's design team believes the time histories used in the analyses are appropriate for the proposed construction and conditions at the site.

As for a history of walls of this size, the Port points out there are at least two other taller MSE walls that have been built in seismically active regions, Steouchi Country Club in Japan and Le Peyronnet AB in France.

District Engineer's Response. I also had questions about the stability of the MSE walls during earthquakes. Therefore, I asked the Port for additional information regarding these issues, which they provided. Based on my independent review of the MSE wall design, I have determined the engineering services contracted by the Port are highly

qualified, the design is being done in accordance with accepted and proven engineering procedures, methods and analyses of the design meet and/or exceed the necessary codes and guidance, and the Port is utilizing an independent technical review board of highly recognized and qualified experts to review the design and testing (Corps, 12 August 2002). Therefore, I have determined the Port has taken the necessary precautions to minimize the potential failure of the MSE walls.

(c) Microclimate concerns. A few individuals believed an environmental impact statement needed to be prepared for the MSE walls to assure the public that the creek and wetlands will not be overwhelmed by the heat, wind, and water generated by the wall. They believe the MSE walls will impact surrounding native vegetation and will raise the temperature of Miller Creek, which will adversely affect fish. Also, due to the unprecedented size and mass, they believe the wall could increase shade effects during the morning and raise temperatures in the afternoon.

Applicant's Response. The Port stated the existing trees along the Miller Creek would remain between the proposed wall and the creek where the wall is closest to Miller Creek. Therefore, the lower 1/3rd of the wall will not be exposed to direct sunlight because of the existing vegetation and the upper 2/3^{rds} will be exposed to varying amounts of sunlight depending upon the season. The concrete facing panels will be in direct contact with the fill and the fill would also absorb the heat collected by the panels. The panels will be textured with the majority being uncolored. However, color, green and beige, will be applied in certain areas to form a design visible from a distance. These characteristics will reduce or eliminate the reflected sunlight. Therefore, the Port believes an increase in temperature in the stream or negative impacts to the vegetation is not anticipated.

District Engineer's Response. I agree with the Port's revised analysis regarding this issue as described in the paragraph above. The distance between the walls and the vegetation varies from 40 to 80 feet. In addition, at the West wall in particular, there will be existing vegetation between the wall and Miller Creek. Therefore, the effects on Miller Creek and the vegetation from any heat reflecting or emanating from the MSE walls are expected to be minimal.

Regarding shading effects, there will be a slight change in the amount of early morning sun reaching a small portion of the planted vegetation. However, the adverse effects on the plants from shading are also expected to be minimal.

(d) Aerodynamic concerns. A few individuals believed there is the potential for atmospheric aerodynamic effects that could lead to either the required closure of the runway under certain weather conditions, or accidents involving airplanes landing on the third runway. They stated the potential for shed-vortices, or rotors, from ground objects affecting airplane control and/or continued safe flight had been repeatedly documented in the literature. They provided documentation showing that at the West Wall, a southwest wind, the dominant wind direction for this vicinity, arrives essentially unobstructed and can create shed-vortices. They believe these vortices could produce

unexpected – possibly uncontrollable – roll disturbances for an airplane arriving from the north. They conclude the potential for accidents is dramatically increased for an airplane in transition from air to ground.

One commenter believed the FAA's response regarding possible wind shear does not scientifically verify the safety of the design. They believed the FAA's reliance on partial vegetation, anecdotes from one airport on the east coast, and waiting for operational problems to occur with passengers onboard aircraft does not appear to follow standard engineering practice.

Applicant's Response. The Port believes the walls have been designed to meet all current criteria set forth by the FAA. The design contractor has also contracted bridge design specialists to address these concerns. Therefore, the Port believes no unusual wind conditions are to be expected.

District Engineer's Response. Primary Federal responsibility for determining aircraft safety during takeoff and landing is held by the FAA. They have reviewed the proposed MSE wall designs for aircraft safety concerns and in a letter dated 19 June 2001 they stated "they are relatively certain that the wall will not cause a wind shear situation" for several reasons.

- The north end of the existing runway has a 90-foot drop and no wind shear problem has been experienced.
- The existing terrain and vegetation will likely reduce the exposed wall surface by almost 50 percent.
- The FAA Flight Standards Safety Office has identified the Worcester, Massachusetts Airport as having similar high embankments and they have not reported any problems with wind shear related to the embankment slopes.
- Prior to the runway being opened, Flight Standards will perform a flight check to verify the safety of the runway. If any wind shear safety-related problems caused by the MSE wall are noted prior to commissioning or during normal operations, the Port will be required to take corrective action through techniques such as wind baffles.

Ensuring the necessary flight checks and corrective measures, if necessary, are taken is the responsibility of the FAA. The Port will need to comply with any directions required by FAA. I have reviewed the information presented in the NEPA documents and the letter dated 19 June 2001 and do not find any reason to disagree with FAA's findings. Therefore, no further review or mitigation by the Corps is necessary.

(4) Piecemealing of Project. Several people were concerned the work associated with the MPU and being completed to facilitate construction of the third runway should not be allowed prior to permit issuance. Examples include relocation of the Southwest Suburban Sewer District main trunk line paralleling Miller Creek. Also, many believed no fill associated with the third runway should be allowed prior to permit issuance.

Many people also requested the environmental documentation surrounding this project include a review of all the proposed MPU projects at STIA. They believed the Port and FAA have yet to present a coherent explanation describing what the plans for STIA would be if the third runway were not to be built. They believe the assessment is especially necessary for the assessment of the cumulative effects.

Applicant's Response. The Port has not taken any action at the airport resulting in a discharge of fill material to waters of the U.S. without first obtaining a permit from the Corps. The Corps has informed the Port that any stockpiling of fill material or other development activities in advance of a decision on the Ports' Section 404 permit application is being undertaken at the Port's risk. The Corps has also informed the Port that any development activity at STIA will have no bearing on the Corps' ultimate decision on the Port's permit application.

District Engineer's Response. I do not share the commentors concerns about piecemealing of the project and agree with the Port's response. Regarding the scope of a permit application "[a]ll activities which the applicant plans to undertake which are reasonably related to the same project **and** for which a DA permit would be required should be included in the same permit application" (33 CFR 325.1(d)(2) emphasis added). Therefore, the scope of the permit application has been correctly limited to the third runway, RSAs, SASA, Borrow Area 1, and implementation of the mitigation plans. The Port has provided documentation regarding other potential MPU projects for the cumulative impact assessment.

Regarding the placement of fill, other than three minor permit violations that have been resolved and three NWPs that have been issued for separate projects, the Port has not placed any fill in waters of the U.S. requiring a permit.[33] The placement of the fill in the upland areas was not a factor in my permit decision.

Therefore, I have determined the Port's permit application has not separated out reasonably related projects. Any future phase associated with the MPU proposing work in Corps jurisdiction will be reviewed at the time they are proposed.

(5) Compensatory Mitigation Concerns. Concerns regarding the proposed compensatory mitigation were one of the issues receiving the most comments. Concerns ranged from the belief mitigation is not a proven method for reducing wetland impacts to specific questions regarding the proposed design. However, the vast majority of the comments were just general statements against the mitigation proposal.

[33] Silt laden runoff and hog fuel was placed in wetlands adjacent to the North Employee Parking lot, 0.12 of an acre of land clearing was performed at Parcel #299 in conjunction with survey activities, and 0.01 of an acre of wetlands were filled after a septic tank was removed. All of these violations have been resolved. NWPs 3, 6, and 18 have also been issued for culvert replacement work and groundwater monitoring well installation.

Several people questioned whether the mitigation selected was appropriate. One question was regarding the reliance on enhancement activities. They stated the failure of enhancement activities to compensate for loss of actual wetlands is well documented in the scientific literature including a recent study by the National Academy of Sciences (NAS). They also referenced the NAS studies conclusion that the functions of the proposed compensatory mitigation need to be precisely characterized and quantified and focus on more than a few of the functions. They claimed the Port failed to provide the necessary functional information and focused on just a few functions.

Another question raised was the viability of the off-site mitigation to compensate for impacts in-basin. Many believed off-site mitigation is not appropriate and is inconsistent with the CWA and Section 404(b)(1) guidelines. They believed the wetlands on-site provide many functions that cannot be mitigated for by providing the same function out-of-basin. Many believed there were in-basin options for mitigation that would compensate for the impacts and be in compliance with FAA guidance. They also believed it was unreasonable to eliminate in-basin wetland mitigation for bird-strike reasons, because there is sufficient knowledge of bird species requirements to manage the threat by appropriate wetland design. They believed increasing the mitigation in-basin would help minimize the adverse effects within the basins and help prevent the destruction of remnant natural sites within an area already significantly affected by development. However, one commenter was opposed to the in-basin mitigation proposal because of the risk of attracting birds that could increase the chance of bird strikes.

Related to the alleged reliance on off-site mitigation, several people believed additional mitigation is needed in-basin as the ratios are exceedingly low and are unrelated to the predicted losses.

Specific concerns raised regarding the proposed mitigation included:

- The Vacca Farms mitigation has significant problems including the lack of habitat values, questionable removal of peat soils, and lack of adequate hydrology to maintain the system as a wetland. The wetland will only receive water during extreme storm events such as a 100-year flood because the compensatory floodplain will be separated from the relocated stream channel by a ridge typically 2 to 4 feet higher than the floodplain. Also, there will be a 32-foot wide high flow section, independent of the floodplain, which will provide significant flow conveyance within the main channel. Also, the engineered floodplain is designed so it all drains to one point at the south end. A naturally occurring floodplain would simply slope gently upwards from the edge of the ordinary high water mark of the entire stream channel so that floodwaters could easily flow into and out of the floodplain along its entire interface with the stream.
- The use of geotextile linear in the Miller Creek realignment project will biologically, chemically, and hydrologically isolate the stream and all its ecological processes from the soils of the substrate. The need for the fabric is because the creation of a stream channel with gravel substrates cannot be accomplished in peat soils. The

water will simply disappear into the organic soils, until they are fully saturated, then there will be an open water pond with water flowing through it.

- The use of highly permeable spawning gravels in the realigned portion of Miller Creek could reduce the ability of the channel to maintain summer base flows.
- There is no pre-project monitoring of wetland hydrology to provide data for measuring post-project success. This lack of data also makes it difficult to determine appropriate mitigation goals, design criteria, and performance standards.
- Information regarding the range of buffer widths needs to be provided rather than just the mean. The drawings show only a 50-foot riparian zone buffering portions of Miller Creek. Fish-bearing streams require buffers that vary from about 90 feet to 200 feet. Because the upper portion of Miller Creek will be next to the proposed project, a wider buffer than 50-feet is needed to protect the stream from sediments and pollutants associated with the construction and use of the proposed runway.
- More information needs to be provided regarding the size of large woody debris (LWD) that will be used in the streams and how it will be anchored. LWD that is placed above the wetted stream margin is useless to fish and if they are improperly anchored, they can become dislodged, move downstream, and potentially cause localized flooding.

Several people also questioned the proposed monitoring plan. They believed more than 10 years of monitoring should be required, as initially proposed in the NRMP. They also believed a trust fund of $150,000 was not enough money for proper monitoring and a large bond should be required to ensure funding is available for the entire monitoring period. A few also questioned whether the Port may not have sufficient funds available to complete the mitigation as the financial premises on which the decision to build the third runway have given way to a new reality because of September 11th.

Applicant's Response. The Port believes a number of wetland and stream mitigation projects have been successfully planned, implemented, and monitored in the Puget Sound area. Therefore, they believe mitigation is a viable option for compensating for the potential impacts.

The Port's believes their analysis demonstrates the watershed-dependent wetland functions will be fully mitigated in the impacted watersheds and the complete mitigation package will effectively assure that localized and cumulative impacts from the project do not occur. They also believe records from bird strikes occurring at the airport indicates several avian species using a wide variety of wetland and upland communities are of concern at the airport. Forests with closed canopies can support a wide variety of birds, including large raptor species, which can also be of concern. They believe effective wildlife management requires more than just removing preferred habitat but must also look at the interactions between predator and prey species and the variety of micro-environments necessary to sustain populations. They conclude the mitigation proposed complies with the FAA circular and compensates for the functions to be impacted.

Regarding the specific concerns the Port believes:

- The Vacca Farms mitigation has been properly designed to restore and enhance the wetland functions. Micro-topographic features are planned to increase the functions supported by the wetland. Removal of the peat is necessary to compensate for the impacts to the 100-year floodplain caused by the required relocation of 154/156th Street. Wetland hydrology is supported by high groundwater elevations with minor contributions from overbank flows and the design of the mitigation will maintain the necessary hydrology to support the wetland. The channel has increased conveyance capacity when compared to the existing channel; however, it is designed to overtop its banks at flows greater than annual peak flows and not just during extreme storm events. In addition to overbank flooding from the creek, "backwater" flooding could occur by floodwater overtopping the existing creek banks downstream of the relocated segment. Backwater flooding is a natural condition present along many large and small stream systems.
- The proposed geotextile fabric is highly permeable, and is designed to permit groundwater exchange. There is no concern regarding the disappearance of water into organic soils, as monitoring demonstrates that a high water table is present on the site and the elevation of the stream channel will be very close to the elevation of the groundwater.
- The specifications for the realigned creek channel gravels include fine sands and silts to avoid the disappearance of the water into the spawning gravels.
- Pre-construction groundwater monitoring data is not necessary to establish hydrology performance standards and to evaluate potential impacts to the wetlands located downslope of the project. Indicators such as existing vegetation, soils and hydrology provide the basis for determining if wetland hydrology is sufficient to maintain existing habitat functions post-project. Criteria based on vegetation and soil conditions are free of short-term variation and aberrant conditions found in short-term groundwater monitoring.
- The range of buffer widths is clearly shown on the plan sheets included with the NRMP. The City of SeaTac requires 100-foot buffers for Class 2 streams with salmonids but does allow for buffer averaging in their Sensitive Areas Ordinance.
- Details showing the number, location, types, and general size of the LWD features are provided in the plan sheets included with the NRMP. The proposed design has been discussed with WDFW and is consistent with the conditions of the HPA. Burying the LWD is the preferred method of anchoring and many of the logs will be oversized in relation to stream power and are unlikely to move during high flows.

As required by Ecology and the Corps, the Port has revised the NRMP and will implement a detailed monitoring plan spanning a period of 15 years. The Port stated the purpose of the trust fund is not for monitoring of the proposed mitigation plan. The trust funds, $150,000 each for Miller and Des Moines creeks, is to provide monetary support for projects proposed outside of Port property by others who may not have the available funds to complete the projects.

Various consultants for the Port also spoke at the public hearings and provided written comments in support of the proposed mitigation stating the "mitigation measures are based on current and scientifically valid approaches and will provide improved habitat for aquatic, terrestrial, and avian species." The majority of the commentors supporting the proposed project also stated the proposed mitigation was sufficient to offset the proposed impacts.

District Engineer's Response. I had numerous questions about the Port's proposed mitigation and requested additional information several times throughout the decision-making process, which the Port provided. I also completed an independent analysis of the adequacy of the mitigation, including a functional assessment to identify the functions being impacted and how the proposed mitigation will functionally compensate for the losses, as documented in Appendix C.

The regulations regarding compensatory mitigation states "all mitigation will be directly related to the impacts of the proposal, appropriate to the scope and degree of those impacts, and reasonably enforceable" (33 CFR 320.4(r)(1)(iii)(2)). The regulations also state "[c]ompensatory mitigation may occur on-site or at an off-site location" (33 CFR 320.4(r)(1)). The 1990 MOA between the Corps and EPA states, "[i]f on-site compensatory mitigation is not practicable, off-site compensatory mitigation should be undertaken in the same geographic area if practicable (i.e., in close physical proximity and, to the extent possible, the same watershed).

More recent interim guidance in RGL 01-01 has stated:

> A mitigation project should generally be located within the area (e.g. watershed, county) where a project can reasonably be expected to provide appropriate compensation for the impacts to aquatic resources, including wetlands, under consideration. Mitigation in nearby watersheds may be appropriate and the rationale for this determination should be provided in the mitigation plans. The further removed geographically from the authorized impact the mitigation site is located, the more care must be taken to ensure that the mitigation will reasonably offset the authorized impacts. Ratios should generally increase as the distance between the impact and mitigation sites increase. (RGL 01-01, Paragraph 3(b)(1))
>
> Compensatory mitigation projects that have the potential to attract waterfowl and other bird species that might pose a threat to aircraft should not be sited with the limits specified by the Federal Aviation Administration Advisory Circular on Hazardous Wildlife Attracts on or near Airports (AC No: 1505200-33, 5/1/97) currently 10,000 feet from the airport and 5 statue miles if the attractant may cause hazardous wildlife movement into or across the approach or departure airspace. (RGL 01-01, Paragraph 3(b)(2))

A numeric credit and debit assessment as outlined in RGL 01-01 was not performed for this project.[34] However, my analysis does provide a qualitative functional analysis to ensure the mitigation is in proportion to the project impact, considering both the nature of and the extent of the impacts. As the Port did provide detailed information regarding functions and I performed an independent functional assessment, a determination of the adequacy of the mitigation on a functional basis is appropriate (see Paragraph 9(A) above).

Based on this series of guidance and my independent analysis, I have determined the off-site mitigation at Auburn is appropriate and necessary to compensate for loss of avian habitat at the STIA. The large parcel of land provides the interspersion of a variety of habitats for numerous species of birds and is located in an area frequented both by residential and migratory birds. The off-site location also addresses the concerns in FAA's circular.

Additional on-site mitigation has been provided in the final NRMP (Port of Seattle, 2001d) to compensate for the functions that cannot be recreated off-site. In particular, organic carbon export, fish habitat, habitat connectivity, and various hydrologic functions were targeted.

Regarding hydrologic monitoring, as discussed in Paragraph 9(A) above, maintaining the wetland hydroperiod is an important component in ensuring the remaining wetlands are not adversely impacted. However, assessing the hydroperiod for wetlands is just one factor in determining the overall function of a wetland. I have completed an independent analysis of the adequacy of the mitigation, including the performance standards and monitoring related to hydrologic conditions, to ensure the overall function of the wetlands are maintained. Appendix C documents this analysis and includes the Corps' functional assessment. The Port has also provided more detailed protocols regarding groundwater monitoring (Port of Seattle, 2002) and I have added a special condition to ensure these protocols are implemented (see Paragraph 12(M) below).

[34] RGL 01-01 was issued on 31 October 2001 but is only interim guidance at this time because additional coordination is taking place between the Corps and various Federal agencies before the guidance is finalized. As stated in the text, the RGL "applies to compensatory mitigation proposals submitted for approval on or after the effective date of this guidance and to those in the early stages of planning or development." As the project has been under review since 1996 and the mitigation plan has undergone several revisions prior to issuance of this guidance, the policies outlined are not directly applicable to this project.

To ensure the proposed mitigation is constructed and monitored as designed, the following special conditions will be added to the permit.

a. The *Natural Resource Mitigation Plan, Master Plan Update Improvements, Seattle-Tacoma International Airport* (NRMP) dated November 2001 with the corrections dated January 2002, February 2002, and November 2002, will be implemented. The dates for the submittals of as-built drawings and monitoring reports are as described in the table titled "Reporting schedule for mitigation projects during the 15-year monitoring period". Year 0 is the year the as-built drawings are approved by the Corps in writing.

b. Both the onsite and offsite wetland mitigation areas created, enhanced, and/or restored as mitigation for work authorized by this permit, shall not be made the subject of a future individual or general Department of the Army permit application for fill or other development, except as permitted in the restricted covenants found in Appendix G of the mitigation plan or for the purposes of enhancing or restoring the mitigation associated with this project. These covenants will be recorded with the Registrar of Deeds or other appropriate official charged with the responsibility for maintaining records to or interest in real property. Proof of this documentation must be provided to the Corps of Engineers, Seattle District within 90 days of permit issuance.

c. No irrigation can be performed in any mitigation area for more than 3 consecutive years without written approval from the Corps. No irrigation may be performed after Year 4 in any mitigation area without written approval from the Corps.

Reporting schedule for mitigation projects during the 15-year monitoring period.

	Monitoring Year															
Mitigation Project	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Des Moines Way Nursery Site	□	■	■	■	◆	■	◆	■	◆	◆	■		■			■
Vacca Farm	□	■	■	■	■	■	◆	■	◆	◆	■		■			■
Miller Creek Relocation	□	■	■	■		■		■			■		■			■
Miller Creek Buffer	□	■	■	■		■		■			■		■			■
Stream Enhancement	□	■	■	■		■		■			■		■			■
Replacement Drainage Channels	□	■	■	■	■	■		■		■			■			■
Tyee Valley Golf Course	□	■	■	■		■		■		■	■		■			■
Restoration of Temporary Impacts	□	■	■	■	◆	■	◆	■	◆	◆	■		■			■
Monitoring for Indirect impacts	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
Auburn Wetland Mitigation	□	■	■	■	◆	■	◆	■	◆		■		■			■
Contingency Actions	▣	▣	▣	▣	▣	▣	▣	▣	▣	▣	▣	▣	▣	▣	▣	▣

□ - As-built (record) survey and report. Submitted within 60-days of construction and planting.
■ - Detailed monitoring reports. Submitted by December 31st of each monitoring year. Monitoring reports for each project will be combined into a single document.
◆ - Hydrologic monitoring only.
⊙ - Monitoring and reporting follows requirements of the 401 Water Quality Certification.
▣ - Additional monitoring requirements or limited interim reporting may be required of any project if contingency actions are taken.

The NRMP also discusses the timing of plantings along Des Moines Creek in the same area where the Des Moines Creek Basin Committee is planning to remeander the west branch of Des Moines Creek as part of the regional detention facility. To ensure the creek work is performed prior to the Port's proposed buffer plantings, the following special condition has been added to the permit.

d. The timing of the riparian buffer enhancement plantings (the area extending a horizontal distance of 100 feet from the OHWM of the stream or from the edge of riparian wetlands, whichever is greater) along Des Moines Creek will be coordinated with the construction schedule of the regional detention facility and will be planted no later than the end of 2007, without prior approval of the Corps.

Based on my review of the project and the special conditions above, I have determined the proposed mitigation plan is reasonable and has been specifically designed for this project site to adequately compensate for the loss of wetlands and stream impacts on this project site that will occur due to construction of the proposed project for the purposes of this permit. The State can require different or additional mitigation than what is required by the Corps to meet Federal mitigation requirements. The applicant then must comply with both requirements. I have also determined the three PCHB conditions regarding the mitigation do not need to be added to the permit (see Paragraph 9(A) above).

(6) Hydrology. There were over 90 comments made during the permitting process about various hydrology issues. For ease of discussion, these comments were divided into four separate categories, stormwater issues, low flow analysis, water quality, and water augmentation.

***(a) Stormwater Issues*.** The majority of the stormwater comments received were general concerns regarding the Port's ability to comply with permit requirements. They expressed grave concerns because the Port has not offered any financial guarantees for construction of the proposed facilities and they have a consistent history of permit violations and unsatisfactory track record for existing BMP's.

Some of the specific concerns regarding stormwater issues provided by a few individuals include:

- There is no clear and consistent definition of stormwater control standards to which the Port has committed to adhere.
- The lack of available detailed plans during the comment period for the public's review and the lack of a clearly defined review process make compliance with agency expectations a major concern.
- There are discrepancies regarding the amount of existing airport areas generating pollution that will be treated by the facilities.

- There are concerns that over 80 acres currently not being treated would not even be able to be retrofitted.
- There are discrepancies regarding the amount of rooftops assumed to be either pollution generating impervious surfaces (PGIS) or non-PGIS. In particular, subbasin SDN1 shows zinc from two metals roofs may be contributing to the numerous permit violations.
- The Industrial Waste System (IWS) Lagoon 3 may not be able to process airport runoff without overflows to the natural creek
- Expansion of IWS Lagoon 3 would increase waterfowl habitat close to the airport.
- As discharge rates have not yet been negotiated, the size of IWS Lagoon 3 cannot be correctly determined.
- The open water ponds and some of the proposed vaults must comply with dam safety regulations.
- There are concerns regarding the structural integrity of the ponds, Vault SDS7 and Vault G1 in particular.
- Questions were raised concerning interception of the local groundwater table due to the excavation of the proposed stormwater ponds, Pond D in particular.
- Plans need to be included which show how runoff from the face of the MSE wall or from the face of the embankment will be conveyed to the stormwater detention facilities. The plans are needed to prevent erosion damage, minimize the possibility of surface saturation, which might result in localized slope failure, and ensure the detention facilities will provide the required Level 2 flow control.
- More information needs to be provided regarding the geometry of the existing bioswales, their treatment capacity, and performance levels. The current assumed ratio of bioswales to PGIS does not seem to be sufficient.
- None of the projects listed in the Des Moines Creek Basin Plan, including the Regional Detention Facility, are currently planned to include capacity for MPU projects. These projects need to provide their own separate mitigation, stormwater facilities and mitigation in particular. The only adjustment in the sizing of the regional detention facility with regard to future growth was to cover the expected minor shortfall between the King County standards and the total mitigation required to maintain a healthy stream in the future.
- The Port needs to make sure any proposed work is in compliance with the 1972 lawsuit settled in 1974 stating any outfalls that will increase flow above the capacity of Miller Creek are illegal. Walker Creek is a tributary to Miller Creek and the same rule should therefore apply.
- The Stormwater Plan is inadequate and needs to address issues from Underground Injection Control (UIC) program.

One comment was received stating the stormwater plan is a sound, complete plan meeting or exceeding current Ecology and King County stormwater requirements. A consultant for the Port also commented at the last public hearing “this plan is more comprehensive than what we would expect to see in a typical Stormwater Management Plan.”

Applicant's Response: As a political subdivision of the State, the Port stated it is exempted from bond requirements (RCW 4.92.080). The Port believes the stormwater plans in the *Comprehensive Stormwater Management Plan* (Port of Seattle, 2000a) provide the mitigation required to comply with the standards set by Ecology. The Port will operate the facilities as proposed in the plan and in a manner consistent with the various permits conditions placed on the facilities by Ecology through the NPDES permit and/or WQC.[35]

As for the specific comments the Port believes:

- The standards being followed for the stormwater management plan are based on the King County Surface Water Design Manual and Ecology's Stormwater Management Manual for the Puget Sound Basin. The standard being followed requires the detaining of the 2-, 10-, and 100-year post-developed peak flows to their pre-developed magnitudes.
- Ecology has contracted with King County to review the Port's *Comprehensive Stormwater Management Plan* and the Port has made modifications to the plan based on their comments.
- The currently treated impervious surface was correctly reported as 68%.
- The draft Ecology manual requires application of stormwater requirements to the *maximum extent practicable* for the entire site. The relative benefit of retrofitting the 80 plus acres is not currently practicable.
- The *Stormwater Management Plan* contains a discussion regarding the identification and treatment of rooftops that act as pollutants. The Port is taking steps to address the identified problem of the metal roofs in subbasin SDN1.
- Design of the Lagoon 3 expansion fully supports the future treatment rate and storage capacity data as described in the plan.
- The siting of the lagoon complies with the FAA requirements. Wildlife hazard mitigation techniques such as surface aerators, netting, and/or covers will be employed to eliminate and minimize wildlife hazards to aircraft. The ponds will be constructed and operated consistent with the Port's *Wildlife Hazard Management Plan*. If the ponds become hazards, appropriate contingencies will be implemented.
- The expansion of the IWS Lagoon 3 is already under construction.
- All ponds constructed thus far have been exempt from dam safety review. If dam safety review is required in the future, plans will be finalized in compliance with those regulations.
- A geotechnical report for stability and constructability of the vaults will be completed as part of the final design.
- The potential impacts of the ponds on the hydrology of downslope wetlands have been analyzed. The design of each pond includes a site-specific evaluation to ensure the pond is designed to be above the observed water table levels at each site. An indirect impact of 0.02 of an acre to Wetland 39 has been determined for

[35] The PCHB also added conditions regarding stormwater. The Port and/or Ecology are appealing some of the conditions (see Paragraph 9(C) above).

temporary construction of Pond D. Additional mitigation efforts to reduce the potential impacts include installation of a second discharge orifice to ensure water is available to the remainder of the wetland.

- The surface water runoff from the MSE wall will be conducted laterally in the wall terraces to catch basins that are part of the storm drainage system. The Ports' design has included engineering input on the embankment failure at the Telluride Airport to help ensure the stability of the embankment fill.
- The existing bioswales were sized in accordance with the King County Manual.
- The stormwater impacts from existing airport areas will be mitigated by proposed detention ponds and vaults. The Port will continue to participate in constructing regional stormwater detention facilities. If the Miller Creek or Des Moines Creek facilities are expanded or constructed, the Port would reduce detention volumes to meet the applicable standard.
- The concerns addressed in the 1972 settlement agreement, i.e. stormwater detention, have been considered with regard to the MPU projects and are documented in the FEIS and FSEIS. The proposed MPU improvements will not increase in-stream flows.

District Engineer's Response. Primary responsibility for the development, review, and implementation of the stormwater plan and stormwater issues is with Ecology through the Section 401 Water Quality Certification and NPDES Permit. The Port has prepared a Stormwater Plan to comply with the King County Manual and the Ecology Manual and they have been working with King County to review the Port's Plan.

The Corps regulations state:

> … the Clean Water Act assigns responsibility for control of non-point sources of pollution to the states. Certification of compliance with applicable effluent limitations and water quality standards required under provisions of section 401 of the Clean Water Act will be considered conclusive with respect to water quality considerations unless the Regional Administrator, Environmental Protection Agency (EPA), advises of other water quality aspects to be taken into consideration. 33 CFR 320.4(d)

Ecology has issued a WQC approving the Stormwater Plan with revisions and includes many conditions to ensure compliance with the plan.[36] The EPA did provide a comment regarding the low flow analysis and their concerns are addressed in Paragraph 10(C)(1) below. Additional discussion regarding the low flow analysis can be found in Paragraph 10(A)(6)(b) below. Based on this information, it is my position that the stormwater concerns have been adequately addressed.

[36] The PCHB added WQC conditions regarding stormwater. Only some of the conditions have been added to the DA permit (see Paragraph 9(C) above).

As for the UIC program, it was delegated to Ecology in 1984. The program is rule authorized, which means the wells have to be registered but do not require a permit. A Department of the Army permit does not obviate the requirements of other local, State, or Federal laws. Therefore, no further action by the Corps is required regarding the UIC program.

(b) Low Flow Analysis. Overall the low flow comments conveyed concerns about the credibility of the analysis and the lack of design detail. However, the majority of the comments received regarding the low flow analysis raised specific concerns with the report. Some of the specific issues raised include:

- Problems with the model(s) used include:
  - The estimates are an abstraction from reality because the Port used a variety of modeling simulations with the estimates based on statistical analysis of the model results and not based on actual flows.
  - There are no estimated error bands or confidence limits on the analysis.
  - The calibrations should place more emphasis on matching upper basin flows rather than using gages lower in the watershed. King County stream gages 42C on Walker Creek and 11F at Tyee Weir on Des Moines Creek should be used.
  - Understating the hydrologic flashiness of the system.
  - Not including the model input files for Walker or Des Moines Creek so they can be reviewed.
  - Not confirming the assumptions.
  - Not considering the low-flow impacts of ongoing programs to prevent seepage and leaks from the IWS.
  - Not taking into account the gravel mining operations in borrow areas and the elimination of the last forested headwater area in Des Moines Creek.
  - The analysis does not represent existing basin conditions because year 2006 conditions are used to define “existing” conditions.
- The use of “reserve stormwater” to augment low flow is new to the stormwater design/review process. The reserve storage areas will function entirely as dead storage for up to nine months, accumulating whatever materials or pollutants might precipitate from the live storage zone during that time. This could cause severe water quality impacts on the streams with the “first flush” of the reserve stormwater vaults.
- The method of release, passive or active/managed, has not been determined. Using a passive release system provides no assurance water will be available in the stream when it is needed. If an active/managed release of water is used, a water right must first be obtained.
- The sources of the water supporting the creek baseflow, possibly including seepage from unlined IWS lagoons and irrigation runoff from the golf course, are poorly understood and need to be determined for reasonable assurance of appropriate mitigation. The issue of the IWS ponds could be of particular importance for analyzing the potential impacts to Walker Creek.
- The design and function of the underdrain needs to be more accurately detailed and assessed so the amount of water available from infiltration can be determined. If

the underdrain proposed for beneath the fill does not function as designed, the consequences could be substantial because maintaining seepage flow hydrology to the wetlands is essential to their continued viability, for the input and output of nutrients, their availability for habitat, and other functions.

- The sequential and functional relationship between the TESC swales, inner collection swale, and the replacement drainage channels needs to be explained. The implications of changing the current system include changes to the nutrient transport systems, reducing the size of the wetlands, changing the hydroperiod, and changing the plant species and community composition.
- If flow in either project stream falls below 1.0 cfs, depth and wetted area will be reduced, resulting in increased temperatures and lowered DO levels.
- Low flow impacts at the borrow areas may be suitably mitigated if the areas are reclaimed to a forested basin; however, the Port has not provided any assurance this will occur.
- The revised July 2001 Low Flow Analysis is still inadequate to accurately determine if there will be stream impacts.
  - The analysis does not address the low-flow impacts likely to result from the post-1994 expansion of and improvements to the IWS and the future airport business park development at the borrow sites.
  - Details regarding the connection of the vaults to the streams need to be provided to ensure sufficient water makes it to the stream and is not lost to seepage or transpiration.
- A detailed review of the recent plan to replace the foundation soils under the MSE walls needs to be conducted to determine the adverse impacts to Miller Creek and the wetlands adjacent to the creek.

Applicant's Response. The Port believes the *Low Streamflow Analysis* and the supporting reports provide a comprehensive analysis of the hydrologic effects of the proposed Third Runway fill embankment, proposed stormwater detention ponds and vaults, and changes in water usage within the buy-out area of the basins. The report concludes there will be no net effect on the low flows of the Des Moines, Miller, and Walker creeks given the changes in runoff conditions, delayed discharge of water percolating through the runway embankment fill, changes in water uses within the buy-out areas, and managed release of stormwater from reserved storage facilities.

The Port believes models are the best means available to predict the potential for changes to the system and the models used were calibrated on actual flow data. Data from gage 42C is being used to improve the Walker Creek model, as is data from gage 11F to calibrate the Des Moines Creek model. The Port also believes the flow reductions have been evaluated using well-calibrated hydrologic models that are capable of evaluating hydrologic water balance in watersheds. The modeling in the *Stormwater Plan* compares the 1994 conditions with the proposed 2006 conditions.

The Port believes the collection and storage of surface water in underground facilities is not a new concept. Wetponds and wetvaults are used for long-term storage and to remove pollutants. The Port believes design considerations to address water quality

concerns are discussed in the plan. Furthermore, the Port believes the assertion that a water right is required for stormwater detention for the sole purpose of mitigating the impacts from the construction of MPU improvements is at odds with the applicable statutory and case law, as well as the applicable regulations.[37]

The Port did not include the expansion and lining of Lagoon 3 in the modeling because it is not a MPU project. In the model, Lagoon 3 is treated as water not infiltrating or contributing runoff because the lagoon was designed with drainage and pump systems beneath the liner to reduce upward groundwater discharge pressure. Therefore, the Port believes this suggests this area is actually a groundwater discharge area and an insignificant groundwater recharge area.

The Port believes the movement of water through the fill and MSE wall and the collection and diversion of seepage flows to wetlands has been extensively evaluated and is described in a variety of documents. The Port believes these structures have been designed so shallow groundwater will continue to support wetlands and Miller Creek west of the walls and embankment. The Port also believes the drainage layer at the base of the embankment fill is designed to prevent the build-up of excess pore pressures in the overlying fill material. Therefore the Port believes, the drainage layers provide a high-permeability pathway allowing drainage to occur to the toe of the embankment if the rate of infiltration and seepage through the embankment exceeds the permeability of the underlying native soils.

The Port stated they designed the drainage channel system to replace existing channels conveying surface flows in the area. The Port believes the replacement channels will disperse flow over a broader area than the existing ditches and culverts they replace. Because hydrologic conditions will be maintained in downslope wetlands (i.e. the wetlands will continue to receive groundwater seepage and channelized flow), the Port believes the nutrient dynamics in the wetlands following construction will be similar to current conditions.

As for the embankment design and its potential impacts to wetland hydrology, the Port states they have been the subjects of independent reviews. They believe these evaluations have found the delay in water movement through the embankment would extend the period of groundwater discharge from the area and this could benefit low flow conditions in Miller Creek and downslope wetlands.

The potential hydrologic impacts of the borrow areas were not evaluated in the *Stormwater Plan* because the Port believes the modifications are considered temporary and reversible. However, the potential impacts to wetlands and streams were examined in the *Functional Assessment*. Field investigations, soil classifications, and comparison of soil gradation tests from the field samples were used by the Port to help

[37] The PCHB ruled that a water right would be required for the non consumptive use of the stormwater. The Port's appeal of the PCHB decision is in part challenging this requirement.

determine the potential impacts to groundwater infiltration due to the excavation activities. The Port believes while it is possible in some instances grading would reduce surface infiltration, it is more likely the removal of less-permeable perching layers and till will in fact increase the potential for infiltration and recharge and increase baseflows to Des Moines Creek.

District Engineer's Response. I also had questions about the low flow analysis and therefore, I asked for additional information, which was provided. I independently reviewed the *Low Streamflow Analysis* and the supporting studies as documented in two memorandums on hydrogeological review (Corps, 11 and 15 August 2002) and the one reviewing the modeling (Corps, 2 August 2002). Regarding the embankment areas, the Corps had questions regarding the simulation periods used and the calibration of the models in Miller and Walker creeks, the equilibration time for the embankment soils, and designing the mitigation to account for the uncertainty in the modeling. The Port responded to these concerns in their letter dated 13 September 2002 (Port of Seattle, 2002). After reviewing the Port's response and additional information subsequently provided by ACC, I have determined the Port's analysis and proposed mitigation is adequate for protection of the low stream flows, water quality, wetlands, and the aquatic environment. Because of the relatively small size of water flows involved, the overall conservative approach to the modeling, and the special conditions requiring monitoring of the low flow, I do not believe additional changes to the modeling or proposed mitigation are required. The Corps' review of the potential low flow impacts to Des Moines Creek raised no internal concerns. Additional discussion can be found in Paragraph 9(C) above, especially the PCHB condition regarding the 1 cfs threshold requirement in Des Moines Creek.

As a result of the analysis, the Port is proposing mitigation for both Walker and Des Moines creeks. To ensure the low flow mitigation is implemented as designed, the special condition described in Paragraph 9(C) above will be added to the permit.

Regarding water rights, as discussed in Paragraph 9(C) above, the PCHB determined a water right needs to be obtained because "the diversion and impoundment system combined with the subsequent application of water to a beneficial use takes the Port's plan beyond simple 'management' of stormwater to an appropriation triggering water code requirements." A special condition will be added to the permit to ensure the water right is obtained before paving occurs.

***(c) Water Quality*.** Most of the comments received regarding water quality questioned the Port's ability to meet the water quality standards, in particular based on the number of past violations. Many believed the Port has not provided sufficient information for Ecology to make a determination regarding water quality standards. Some of the more specific comments received are as follows.

- There have been a number of past violations of permits, NPDES in particular, which have led to water quality problems in the affected watersheds. The Port has repeatedly not disclosed information regarding possible sources of contamination.

For example, the Port in 1999 had to fine an "errant" subcontractor who caused mud and silt to be discharged into Puget Sound.

- The redefinition of the watersheds has the effect of concentrating the remaining pollutant load. In particular, the proposed expansion of the SASA and the diversion of 58 acres of runoff producing area to the IWS. The Port has a history of permit violations and unmet water quality criteria. The pollutant load in the streams could be impacted if the IWS, which is designed for a 25-year storm event, is overwhelmed during larger storm events.
- The use of swales and filter strips as a disposal site for water-borne pollutants needs to address the potential impacts for shallow soil disposal of long-lived pollutants. Filter strips are not very effective at removing anything but sediment. Many pollutants, such as metals, organics, and petroleum products will build up to substantial amounts. Re-mobilization in relatively large slugs by heavy rains has not been assessed. The goal of the swales in the King County Manual is for the management of suspended solids and other management practices are discussed for other pollutants.
- The proposed construction activities will disturb and mobilize 50-years worth of accumulation of contaminants at the airport. Some of the hazardous materials have found their way into the local groundwater and several more wells and creeks have been identified as potential local receptors of exposure to these contaminants. The Port has not made systematic provisions for dealing with these contaminants.
- The existing BMPs for stormwater at the airport have not been working partly because they were not designed for the water treatment problem at hand. Yet the Port is planning to install more of the same types of facilities that will result in perpetuation of water quality violations. The Port's own testing shows the airport has contributed to exceedances of toxic metals in both Miller and Des Moines creeks. Specific concerns were raised regarding copper and zinc in particular, as they are toxic substances. Value of sampling diminished as they have not tested upstream of the STIA. The Port cannot prove stream conditions will not worsen with proposed project. These discharges are routed to Class AA streams on the 303(d) list of impaired waters. The Port should treat all storm and industrial wastewater to removal metals and other known toxic chemicals to levels below known toxicity to fish and the ecosystems supporting them.
- The project will increase the use of deicers and increase the runoff of anti-icer residues to streams. These chemicals are toxic to aquatic life at relatively low concentrations. The 1999 Cosmopolitan study is flawed and they cannot say the sag in dissolved oxygen (DO) is not due to breakdown of de-icer. The chemicals do not pass through systems as fast as suggested as the acetate binds to fines, settles to the bottom of the ponds, and with low bacterial decay in winter, the time lag before the oxygen sag is unrealistic. Rainfall does affect DO concentrations but does not explain the variations observed in the 1998-1999 data. The Port needs to address toxicity in a meaningful way.
- The presence of fecal coliform of human origin from airplane wastewater in Des Moines Creek raises the possibility that other human pathogens enter Des Moines Creek and will collect and persist in sediments in the proposed detention vaults,

posing potential human health risks when they are discharged to the project streams to augment summer low flows.

Applicant's Response. The Port believes it is in compliance with its NPDES permit and State water quality standards. The Port's responses to the specific issues raised are:

- The project changes the exact location of the hydrologic divide between Miller, Walker, and Des Moines creeks but the basin area of each subbasin affected does not change. There was a diversion of surface runoff to the IWS system in the Miller Creek basin implemented under the NPDES permit and this change was included in the calculations made in the *Stormwater Management Plan*. No untreated flows would occur in the 50-year King County Runoff Time Series period of record. In the event of an unusually large storm exceeding any storms of the past 50 years, stormwater would be very dilute and unlikely to impact the stream system.
- Swales and filter strips are the best management practices specified in both the King County and Ecology stormwater management manuals. These treatment methods are used for applications such as street and highways (i.e. similar applications to runways), specifically to target pollutants such as total suspended solids, oil and grease, and metals. Scientific studies have demonstrated biofiltration BMPs effectively remove other pollutants besides sediment.
- The Port has acknowledged some environmental contamination has occurred in the 50 plus years of operation at STIA. The Port and its tenants continue to work with Ecology under MTCA to monitor and remediate contamination. The boundaries of the contaminated groundwater have been defined by site investigation data obtained through the placement and sampling of groundwater monitoring wells. The Port is not aware of any evidence the MPU improvements would mobilize any contaminants. The Aircraft Hydrant Fueling System will be constructed through known contaminated areas but will be constructed with controlled density fill to stop migration of contaminants along the pipeline. Evidence collected from individual site investigations have demonstrated existing perched zone contamination has remained localized within the Airports Operations and Maintenance Area and it has not migrated significantly along constructed utilities or infrastructure and into the shallow regional aquifer. The erosion and sediment control measures have been successfully used for the past three years for construction ongoing at STIA.
- The Port has performed whole effluent toxicity testing as required by their NPDES permit and the results show that undiluted stormwater from three of four tested outfalls is not toxic to aquatic life. Relevant data are reported in the Annual Stormwater Monitoring Reports submitted to Ecology. For the outfall where toxicity has been suggested, additional testing was completed and the likely source of the toxicity was removed. The *Biological Assessment* concluded none of the concentrations predicted to occur at the outfalls to the mouths of Miller and Des Moines Creek would result in any significant adverse effects to chinook salmon or bull trout. As discussed in the *Comprehensive Stormwater Management Plan*, copper and zinc concentrations in stormwater from STIA in the future will either be unchanged or lower than the environmental baseline as a result of increased water quality treatment and detention. Many existing stormwater areas will be retrofitted to

improve water quality. Of Miller and Des Moines creeks, only Des Moines is on the 303(d) list and then only for fecal coliform, not metals.

- Glycol based deicers are only used in areas of the airport which drain to the IWS ponds. Use of glycols on the runways and taxiways was terminated in 1992. Only more environmentally compatible, acetate-based compounds are used in these areas. EPA has rated the Type I acetate-based compound, the most commonly used de-icer as "relatively harmless". In 1995, the Port obtained a certification from Ecology saying the waste aircraft deicing fluids containing ethylene glycol are not dangerous wastes. Because of the high solubility of potassium and sodium acetates in water, they will not adhere to the soil and sediment. The Port believes given the infrequent and minimal use of deicers at STIA, the reports findings of no visible relationship between the application of deicers and levels of DO in the ponds will not change.

District Engineer's Response. Though primary responsibility for water quality issues is with Ecology through the WQC and NPDES Permit, the Corps also reviewed these issues as discussed in Paragraph 9(C) above and throughout Appendix B and C. The Port has prepared a *Stormwater Plan* and *Low Streamflow Analysis to* comply with the King County Manual and the Ecology Manual and they have worked with King County to review the Port's Plan.

The Corps regulations state:

> … the Clean Water Act assigns responsibility for control of non-point sources of pollution to the states. Certification of compliance with applicable effluent limitations and water quality standards required under provisions of section 401 of the Clean Water Act will be considered conclusive with respect to water quality considerations unless the Regional Administrator, Environmental Protection Agency (EPA), advises of other water quality aspects to be taken into consideration. (33 CFR 320.4(d))

Ecology has issued a WQC and NPDES Permit approving the *Stormwater Plan* and *Low Streamflow Analysis* with revisions and both permits include many conditions to ensure compliance with the plans. The EPA did have concerns regarding the low stream flow analysis, which have been addressed as discussed in Paragraph 10(C)(1) below. The WQC and NPDES Permit serve to minimize the adverse effects on water quality. The PCHB also added several conditions regarding water quality concerns. As described in Paragraph 9(C) above, I have added several of the PCHB conditions as special conditions to the permit.

(d) Water Augmentation. A few individuals believed the Port has provided incomplete, conflicting, and inconsistent information regarding the water source for low flow mitigation. Possible sources included Tyee Golf Course Well No. 1, Seattle Public Utilities (SPU), or water from stormwater facilities. Several comments were received concerning the use of SPU water to augment Des Moines Creek flow and the efficacy

of using sodium sulfite tablets to dechlorinate the water. They stated removal of fluoride would be necessary as it can have both lethal and sublethal effects on fish and other aquatic life and the temperature differences between the stream and mitigation water pose a concern. One individual also stated the Port has not provided a valid water right to use the water from Well No. 1.

Applicant's Response. The Port's mitigation plan for impacts to streamflow is to detain stormwater in supplemental stormwater vaults and manage its release. The Port is still participating in the Des Moines Creek Basin Planning Committee's effort to use Well No. 1 to mitigate basin-wide impacts. However, Ecology would need to change the Port's Water Right Certification No. 2369 to include stream flow mitigation. To be able to use the SPU water, Ecology would have to approve a change to SPU's water right claims and/or permits. SPU declined to apply for the necessary change. Therefore, SPU water will not be used.

District Engineer's Response. I concur with the Port's response. These issues have been resolved as no water from SPU or Well No. 1 will be used to augment low flows. A discussion of the current plan for low flow mitigation can be found in the low flow analysis discussion above (see Paragraph 10(A)(6)(b)).

(7) Contaminated Fill Material. Many comments were received regarding the past and potential future use of contaminated fill material throughout the proposed project. Several people believed full disclosure of all the source of all the material used, and to be used, should be required by the Port. In particular, several people were concerned about using material from Maury Island as it is contaminated with arsenic. One individual also questioned the use of material from the borrow areas also because of arsenic contamination.

Several individuals questioned the appropriateness of the Soil Fill Acceptance Criteria. They believed the MTCA Level A criteria are inadequate because the use of groundwater versus surface water quality standards and there is inadequate sampling requirements and identification of contaminated areas. Furthermore, the MTCA defines levels below which it is not practical or feasible to clean any further rather than defining acceptable criteria for importing to a clean site.

Regarding the material already imported, many people were concerned the Port has already used contaminated fill not meeting the proposed criteria. For example, they believed contaminated material from the First Avenue Bridge project, Hamm Creek restoration site, and the Black River Quarry have already been accepted and they were contaminated. For the First Avenue Bridge project, they believed hot spots for total petroleum hydrocarbons (TPH) were not fully delineated and the number of samples was not adequate to determine acceptability. For the Hamm Creek fill, a Corps memorandum indicates the samples were composited and therefore, they believed there is the potential for hot spots to go undetected as the material contained PCBs and DDT which can be toxic to aquatic life. They also believed the sampling completed by Boeing from 1990 was too old to rely on. Finally, they claim the sampling of materials

from the Black River Quarry shows the material exceeds the total petroleum hydrocarbons standards in the criteria.

The concerns raised over the use of contaminated fill material are primarily related to the potential for the chemical contaminants to percolate down through the fill to the groundwater and ultimately contaminate the wetlands and surface water. A few individuals also raised a concern about potential contamination of the drinking water sources under STIA because of the use of contaminated fill.

Applicant's Response. The Port believes the 1999 Airfield Project Soil Fill Acceptance Criteria (Soil Acceptance Criteria) contains the process for ensuring contaminated fill material is not incorporated into the Third Runway as agreed upon by Ecology and coordinated through the ESA process. The Port claims these procedures include identifying the potential source of material, categorizing the site which identifies the appropriate level of evaluation and testing, conducting the required environmental evaluation, ensuring the soils meet the MTCA Method A standard, visually inspecting the material as it arrives on site, and providing quarterly reports to Ecology regarding the material brought to the site. The Method A standards are used to determine whether soil in any location, under any conditions, may remain in place for unrestricted use. They are protective of human exposure in residential settings and of ground water used as drinking water.

Regarding the material already accepted, the Port stated the First Avenue Bridge material was sampled and portions were determined not to be suitable as fill material. The area containing the unacceptable material was flagged so it would clearly be distinguished from other site material. Regarding the Hamm Creek material, the Port's evaluation was based on both the Corps and Boeing studies. While the material was tested using the Puget Sound Dredge Disposal Authority protocol for open water disposal, the results were evaluated based on MTCA Method A standards.

Regarding Maury Island, the Port is not proposing to mine material at this location. If the embankment contractors propose to mine from this location, the material would have to meet all of the specification requirements as previously described. As for the borrow areas, the topsoil which is the portion with potential arsenic contamination, will not be used as a fill material.

District Engineer's Response. The Section 404(b)(1) Guidelines state:

> (b) No discharge of dredged or fill material shall be permitted if it:
> (1) Causes or contributes, after consideration of disposal, site dilution and dispersion, to violations of any applicable State water quality standard;
> (2) Violates any applicable toxic, effluent standard or prohibition under section 307 of the Act; (40 CFR 230.10(b)(1 & 2))

In the state of Washington, Ecology is the agency with primary responsibility regarding Section 401 and 402 and implementation of Section 307. The Port, in conjunction with Ecology developed criteria by which to screen and test the acceptability of the fill material to be used for this project. The criteria have also been reviewed and modified by USFWS through the ESA consultation process. The Port has agreed to additional testing requirements as discussed in the Biological Opinion, Appendix A in particular, issued by USFWS on 22 May 2001. These criteria apply to both fill material imported from off-site sources and the on-site borrow areas. The material already imported to the site meet these same criteria.

The PCHB also further refined the fill criteria and does not allow the SPLP testing process. As discussed in Paragraph 9(C) above, I have reviewed the PCHB condition, WQC, the USFWS BO, and the various other comments provided regarding the fill criteria and have determined the fill criteria provided in the WQC are protective of the aquatic environment. I have also determine the SPLP testing should be allowed to be used (see Paragraph 9(C) above).

(8) Supplemental EIS Required. Several individuals requested a supplemental EIS be prepared because "significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts" (40 CFR Part 1502.9(c)) has been provided since the last SEIS. The new information these individuals cited includes the selection of and detailed design drawings for the MSE walls, ESA listings, the alleged use of contaminated fill, lack of a cumulative impact assessment, increase in the wetland impact acreage, repeated changes to the Stormwater Management Plan, additional MPU projects proposed, inaccurate maps of tributaries to Walker and Miller Creek, ongoing violations of the Port's NPDES permit, changing streamflow augmentation plans, a more detailed review of the feasibility of the proposed Auburn mitigation, development of a low flow analysis, the events of September 11th, etc. They also believed a supplemental EIS would allow all the potential project impacts to be comprehensively and cumulatively considered under NEPA. By not publishing a supplemental EIS they believed the Corps would be depriving the public of sufficient information to assess the potential impacts to the project and the opportunity to make such comments.

Applicant's Response. The Port believes the environmental documents are adequate and another supplemental EIS is not required. The Port believes "the changes in the project and new information do not present a seriously different picture of the environmental impacts from what was envisioned in the previous environmental documents." The Port believes in the absence of significant changes and new information, the passage of time alone is not sufficient to warrant preparation of another supplemental EIS.

District Engineer's Response. In looking at this issue I have focused on three key areas: 1) whether substantial changes were made relevant to environmental concerns; 2) whether there were significant new circumstances or information relevant to

environmental concerns;[38] and 3) whether the public played a role in the decision making process.[39] The documentation of the rationale for my decision is as follows.

Question of substantial changes

Modifications to the project relevant to environmental concerns have been made throughout the design process. These changes include additional wetlands impacts, final selection of three MSE walls as the retaining walls along portions of the west embankment, and confirmed use of supplemental stormwater vaults for low flow mitigation.

Regarding the wetlands issue, the footprint of the proposed project has not changed since the FSEIS, the increase in acreage resulted from the Port gaining access to all parcels impacted by the proposed action and the final verification of the wetland boundaries by the Corps. While the impact acreage has increased, the functions and values of the additional wetlands to be impacted are representative of those analyzed and evaluated in both the FEIS and FSEIS. None of the additional impact areas have unique characteristics for the geographic region.

The MSE walls were proposed as additional mitigation to minimize the impacts to the wetlands and creeks. In particular, the tallest wall in the middle of the embankment was proposed as a result of the revised delineation performed once access to all the properties was obtained. At that time, Miller Creek was found to be 83 feet closer to the runway embankment than previously indicated. To minimize the adverse impacts and avoid relocation of this portion of the creek, the design for the retaining wall was refined to a MSE wall. The FSEIS also discusses the possibility of needing a retaining wall at the north end in conjunction with the relocation of S 154th/156th Street. While there is a diagram showing a conceptual idea, it does not represent the final proposal. The current plan is a reflection of a more fully developed plan to mitigate for potential adverse impacts. The FSEIS also has a discussion regarding preliminary geotechnical studies completed at that time regarding possible liquefaction during seismic events and possible subgrade improvements. This design component is necessary for the safe construction of the MSE walls as proposed.

While using supplemental stormwater vaults for low flow mitigation was not specifically discussed in the EIS process, the possible impact to low and base flows was discussed.

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[38] The Council on Environmental Quality regulations states in 1502.9(c)(1) that a supplemental EIS is required if: (i) The agency makes substantial changes in the proposed action that are relevant to environmental concerns; or (ii) There are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.

[39] The purpose of an EIS is to "ensure that the agency, in reaching its decision, will have available, and will carefully consider, detailed information concerning significant environmental impacts; it also guarantees that the relevant information will be made available to the larger audience that may also play a role in both the decisionmaking process and the implementation of that decision" (*Robertson v. Methow Valley Citizens Council, 490 U.S. 332 (1989)*).

Possible mitigation measures were discussed including constructing emergent wetlands to moderate flood flows and construction of infiltration facilities. The mitigation plan in the FEIS also discussed the mitigation goal of maintaining base flow. Therefore, the use of the vaults reflects a refinement of the mitigation plan to offset potential adverse impacts.

In summary, while these design modifications represent changes to the project, they do not represent substantial changes relevant to environmental concerns. The nature of the wetland impacts did not change and the MSE walls and supplemental stormwater vaults represent mitigation efforts to minimize the impacts discussed in the EISs.[40]

Question of new circumstances or information

Additional studies generated since the issuance of the FSEIS include a BA and BO discussing more recently listed ESA species, an EFH analysis, a cumulative impact report, several revisions to the stormwater management plan, several revisions to the mitigation plan, several revisions to the functional assessment, multiple geotechnical reports regarding the MSE walls, and several versions of a low flow analysis. Additional information has also been provided throughout the process when questions were raised either by the Corps or as a result of comments letters, especially regarding the events of September 11th. I have reviewed all of this additional information available and have incorporated the information into my decision.

Regarding the wetland issues, to make my determination regarding the potential impacts and the adequacy of the mitigation, I reviewed the NRMP, cumulative impact report, BA, low flow analysis, other applicable reports, and all the various related issues raised in the comment letters. I also completed an independent functional assessment to ensure all of the functions being provided by the existing wetlands were considered in the final mitigation proposal. This review and my rationale for final approval of the mitigation plan are discussed in detail in Appendix C.

Regarding the recent ESA listings and implementation of the EFH regulations, these changes in legal status in and of themselves do not constitute significant new information requiring preparation of a supplemental EIS. The impacts to fisheries and aquatic resources were discussed in the FEIS and FSEIS. Completion of the required ESA/EFH consultation confirmed the determination the proposed project will not jeopardize the continued existence of a listed species or adversely modify their critical habitats.

Cumulative impacts were extensively discussed in all the EIS documents. I have further performed another assessment based on the changes to the project and the

[40] In *Robertson v. Methow Valley Citizens Council, 490 U.S. 332 (1989)*, the U.S. Supreme Court concluded "NEPA does not require a fully developed plan detailing what steps will be taken to mitigate adverse environmental impacts."

status of non-Port projects since the FSEIS. As discussed in Paragraph 9(S) above, I have determined while the proposed project and mitigation do not reverse the past adverse impacts having occurred in these watersheds, they do not further contribute to the degradation.

I have reviewed the appropriate geotechnical studies regarding the proposed MSE walls, focusing in particular on the seismic and subgrade improvement components. I also reviewed the numerous specific comment letters provided questioning the adequacy of the testing and design review. Based on my independent review of the MSE studies, I have determined the engineering services contracted by the Port are highly qualified, the design is being done in accordance with accepted and proven engineering procedures, methods and analyses of the design meet and/or exceed the necessary codes and guidance, and the Port is utilizing an independent technical review board of highly recognized and qualified experts to review the design and testing. Therefore, I have determined the Port has taken the necessary precautions to minimize the potential failure of the MSE walls.

I have also performed an independent review of the *Low Streamflow Analysis* including the information in the final revised report, supporting reports, and applicable issues raised in comment letters. Regarding the embankment areas, the Corps had questions regarding the simulation periods used and the calibration of the models in Miller and Walker creeks, the equilibration time for the embankment soils, and designing the mitigation to account for the uncertainty in the modeling. The Port responded to these concerns in their letter dated 13 September 2002 (Port of Seattle, 2002). After reviewing the Port's response and additional information subsequently provided by ACC, I have determined the Port's analysis and proposed mitigation is adequate for protection of the low stream flows, water quality, wetlands, and the aquatic environment. Because of the relatively small size of water flows involved, the overall conservative approach to the modeling, and the special conditions requiring monitoring of the low flow, I do not believe additional changes to the modeling or proposed mitigation is required. The Corps' review of the potential low flow impacts to Des Moines Creek raised no concerns. To ensure the low flow mitigation is implemented as designed, the special condition described in Paragraph 9(C) above will be added to the permit.

Partially based on the comments received, I have also identified other areas where additional information was necessary to ensure all the relevant factors concerning potential environmental impacts were considered in my final decision. In particular, the FSEIS was published in part to address the revised forecasts in annual aircraft operations levels. I also requested FAA provide additional information regarding how the operations data available today compares to the model predictions from SIMMOD. However, since that time, the events of September 11th have raised a concern regarding the accuracy of these forecasts. To that end, I did request additional information from the Port regarding the potential impacts of this event on the forecasts. I also reviewed the extensive amount of information provided in numerous comment letters regarding this issue of project need. As discussed in more detail in Paragraph

10(A)(9) below, while this event has had a profound impact on the American public, I have determined the impacts to the forecast are short-term in duration and because of the length of time needed to construct the project, the need for the project is still supported. The FAA confirmed the continuing need for the project in their 7 August 2002 letter stating "[w]e believe that the PSRC's decision [approval of the third runway] was based on sound long-term planning and continues to be valid today." Their position includes a review of air traffic recovery post September 11th.

In summary, the additional studies, designs, reports, delineations, and other information do represent project details not available at the time the FSEIS was published. However, the information only provides more details regarding the potential impacts to the human and aquatic environments from what was presented in the FSEIS. After taking a hard look at the details, I have determined the changes do not represent significant new impacts to the human and aquatic environments beyond what was already considered in the FSEIS. Therefore, a supplemental EIS is not required.

Question of public involvement

I have made every effort to include the public in the application review process, especially since the publication of the FSEIS. The public has been informed of the various changes and has been afforded the opportunity to provide comments. As described in Paragraph 8 above, the Corps has published three separate public notices and has held three separate public hearings throughout the Corps' process as the project has changed. The final public notice included a discussion of the proposed mitigation, status of the ESA review, and availability of the various major studies including the functional assessment, mitigation plan, stormwater plan, and low flow analysis. Besides receiving comment letters during the official comment period, many additional comments have been received, accepted, and reviewed up until the final decision was made. One of the groups in particular making numerous comments was the ACC representing the communities in the vicinity of the airport. Their experts have submitted many letters regarding all of the issues discussed in Paragraph 10(A). In addition, I have afforded both ACC and RCAA, another organization representing the communities adjacent to the airport, several opportunities to meet with me and/or my staff to discuss their various issues of concern.

Conclusion

When deciding whether or not to publish a supplemental EIS, in addition to the CEQ regulations, the Corps's NEPA implementation regulations state:

> A district commander will normally adopt another Federal agency's EIS and consider it to be adequate unless the district commander finds substantial doubt as to technical or procedural adequacy or omission of factors important to the Corps decision. In such cases, the district commander will prepare a draft and final supplement noting in the draft supplement why the EIS was considered inadequate. (33 CFR Part 230.21. See also 33 CFR 325 Appendix B, Paragraph 14 and 33 CFR 320.13(b))

In following both the CEQ and Corps' NEPA guidance, I have carefully reviewed the additional information submitted since the publication of the FSEIS. As discussed above, I have determined relevant to environmental concerns, the design modifications do not represent substantial changes and the additional studies and reports do not represent significant new information and circumstances. I have also afforded the public an opportunity to provide comments on these revisions to the project and have independently reviewed the additional information to ensure the "technical or procedural adequacy" of the EIS. Based on my review of the FEIS, FSEIS, and the changes to the project since that time, the existing FEIS and supplement are technically and procedurally adequate for the Corps to make a decision. Therefore, I find the preparation of a new supplemental EIS is not warranted.[41]

(9) Alternatives. Over 100 individuals commented on the alternatives analysis, the need for the third runway in particular. Some of the airlines commented that a third runway is not needed because the cause of delays at STIA are due to poor weather at other airports, not because of the lack of a third runway. Some comments stated the Port has not given sufficient consideration to other project alternatives including supplemental airports, different configurations, technological improvements, etc. Many believed the technological advances made since the FEIS and FSEIS were completed could solve the delay problems. In particular, recent advancements in relevant communication, navigation, and surveillance (CNS) and air traffic management (ATM) technologies have the potential to enhance the capacity of STIA in good and bad weather. Many also believed the future projections are off so the analysis was flawed. Finally, several people believed the use of regional airports instead of constructing a third runway is viable as are other runway configurations filling less wetlands.

Some of the more specific comments include the following issues.

Several people commented on whether the assumptions, data, analysis, forecasts, statements, and conclusions in the FEIS and FSEIS regarding alternatives are accurate. They believed, especially in relation to the events of September 11th, the need for the third runway be reexamined, as there has been a reduction of approximately 20% in the number of operations at STIA. As a result, they believe the airport has excess capacity. They also pointed out this drop in operations actually began prior to the recent events. As a result of the decline, they questioned whether the airlines have the revenues available to support the infrastructure developments planned prior to September 11th. Several people believed the money should be spent on more pressing public needs, e.g. additional security measures. They also believed the Corps needed to obtain additional information regarding the cost of the proposed project in light of the recent events. To support this request they referenced the recent Corps decision regarding Resource Investments, Inc, where the Corps stated they must

[41] The FAA also issued a revised ROD on 8 August 2001 determining the preparation of another supplemental EIS was not warranted at this time.

pay careful attention to “a determination of reasonable cost to the public to have a service provided.”

Several people also described practical alternatives to the proposed third runway configuration exist requiring less filling of wetlands. They believed runways in the range of 6,000 to 6,700 feet would provide sufficient length to allow for the operation of two runways for landing during poor weather. These shorter runways would also allow both the north and south ends to be moved and thus, reduce the amount of wetlands needing to be filled. They claimed any small benefit derived by the additional runway length would be far outweighed by the large increase in construction cost and the loss of wetlands. They also described an alternative that included a third runway with a lower elevation at the north end thus reducing the amount of wetland fill required.

A few individuals stated insufficient spacing has been provided between runways. Runway 16R/34L is only 1,700 feet away from the proposed 16X/34X runway and 800 feet from the existing 16L/34R runway. As a result, these distances make the middle runway dependant on operations on both of the other two runways. They concluded this means the center runway will become essentially unusable in instrument conditions.

Many people also believed there are several alternatives available eliminating the need for the third runway including using existing regional airports, using a new supplemental airport, moving commuter and regional aircraft operations to Boeing Field, and using advanced technologies. Regarding other regional airports, they claimed demand will only exceed capacity at STIA by 9% in 2015 and this demand could be met at Paine, Boeing, or Bremerton airports, McChord AFB, or Gray Army Airfield. They believed these facilities are neither at capacity nor will they be at 2015.

Several people also pointed out the PSRC identified 12 technically feasible alternative locations for a new supplemental airport. The commentors believed several of these alternative sites provided adequate space for a new small single runway regional supplemental airport at a smaller cost and fewer wetland impacts than the current Port proposal. As Boeing Field is located only 4 miles from STIA and could be regarded operationally as part of STIA, they pointed out some of the operations could be moved to Boeing Field with an efficient passenger connection being established between the two airports. For example, Sound Transit is proposing to have a link between STIA and the south end of Boeing Field by 2009.

Numerous people also believed if the third runway were to be built, this would foreclose any future consideration of a multiple regional commercial airport solution. They believed the scarce money used to construct the third runway could be used to develop a truly regional airport system taking into account the high airport ground access trip costs and the increases to ticket prices which will occur. They also claimed if the correct projects costs would have been reported, a regional alternative might have been selected over the proposed third runway.

Several aviation experts claimed there are a variety of technological solutions available now or in the near future that can avert the need for the third runway including Localizer Direction Aid (LDA) approaches in conjunction with an Instrument Landing System (ILS) approach, global positioning systems (GPS), Precision Radar Monitoring (PRM), Traffic Alert and Collision Avoidance System (TCAS), and Flight Management System (FMS). They stated, some of these systems are already being used at other airports to reduce delays and many others are expected to permit increased arrival capacity for parallel runways by the year 2005. In particular, the integration of Automated Dependent Surveillance – Broadcast (ADS-B) technology with either enhanced Cockpit Display of Traffic Information (CDTI) or by the direct feed of the ADS-B information for one aircraft into another aircraft's FMS could allow simultaneous instrument approached to parallel runways separate by much small distances than currently allowed. They did recognize more information and studies would have to be conducted to determine if the potential capacity benefits of the paired approach concept would ever be as great as compared to the proposed third runway.

These experts also pointed out these technologies, LDA during Visual Flight Rules 2 (VFR2) conditions in particular, could enhance efficiencies during "poor weather" especially because the Port incorrectly calculates the amount of time poor weather occurs at STIA. Using data from the National Oceanic and Atmospheric Administration (NOAA), they claimed poor weather actually occurs only 2.8% of the time during peak arrival demand periods instead of 44% of the year as asserted by the Port. They believed the errors come from using 11 winters and 10 summers of data, assuming certain VFR conditions are effectively Instrument Flight Rule (IFR) conditions, assuming 24 hours of continuous IFR weather rather than the shorter periods occurring in practice, not recognizing the weather in the summer months (peak travel periods) are significantly better than average, and that there are air traffic procedures available allowing approaches on two runways in most if not all VFR conditions. Therefore, they concluded demand is less than capacity more of the year, even in "poor" weather.

Several individuals also claimed the use of naturally occurring demand management will also ensure congestion never reaches the high levels predicted by the Port, and thereby assuring no third runway is required.

Several people declared the Port and FAA data contradict the claim a second arrival runway is needed during poor weather conditions. They referenced the FAA's Airport Capacity Benchmark Report 2001 as showing only 1% of the aircraft were delayed significantly (more than 15 minutes) ranking STIA as only 20th worst in the nation in terms of delays. They go on to claim the Port's forecast of 460,000 aircraft operations by 2005 is only 3% higher than the 446,006 achieved with low delays (per FAA data) in the year 2000. Therefore, they conclude the 5% increase in capacity estimated by FAA from technology and procedural enhancements will offset the 3% operations increase anticipated by the Port from 2000 to 2020 without the benefit of a third runway. They further state this trend of low delays has continued as shown in the first quarter numbers from 2001 and that the FAA and Port data show delays at STIA will never exceed the delays experienced last year. Therefore, they conclude the Port's assertion

they used “state-of-the-art methods” to estimate capacity and delay is discredited. Thus, they believe the mathematical model used by the Port needs to be reexamined and recalibrated for using current conditions. They did acknowledge the Port is correct in not using the U.S. Department of Transportation Bureau of Transportation Statistics to calculate delays.

Other miscellaneous comments regarding potential alternatives included:

- The Port’s alternatives analysis provided to the Corps in two documents dated 11 May 2001 contains many fatal flaws, factual errors, and misstatements. The new documents and associated FAA and Port data available since this analysis was completed reinforces the lack of necessity and urgency for a third runway.
- A recent EIS for the Cleveland Hopkins International Airport indicates over 530,000 annual operations can be efficiently accommodated with a reasonable level of delay with only 2 runways with a proposed runway separation of 1,241 feet.
- As taxpayer dollars are being used for the construction of the project, the money should not be wasted on projects the taxpayers do not want.
- The airport should be built on pillars instead of hauling in all of the dirt.
- The use of a conveyor belt to transfer the required fill material for the construction of the third runway would be more cost effective than trucking for either on or off-site borrow sources.
- The data in the FAA’s 8 August 2001 ROD shows a new practicable alternative (its “do-nothing alternative”) has more than sufficient excess capacity to meet the purpose and need assumed for construction of the Third Runway.

Applicant’s Response. Regarding the horrific events of September 11th, the Port believes this event does not change the weather patterns at the airport or the Port’s need for dual arrival streams. While travel was down immediately following the event, the Port believes all indications are that airline travel is recovering and at least two of STIA’s major carriers are expected to return to pre-September 11th levels sometime in 2003 or 2004. The Port believes data regarding delays at the airport show delays continue to increase significantly in poor weather even after September 11th. While delay time was down in September due to the reduction in air service, even in poor weather conditions, the average arrival delay of 7.17 minutes exceeds thresholds indicating the need for the runway. In fact, the Port believes the delay time is very close to the delay routinely experienced at STIA in 1994, when planning for the 3rd runway was initiated. The Port states STIA is already back to more than 80% of the normal scheduled operations partially as a function of the high origin-destination traffic. Therefore, the Port concludes the need for the runway exists today, even given the reduced flights experienced since the airport was reopened to air traffic. The Port believes the traffic growth will increase and return to prior levels sometime in 2003 or 2004.

The Port believes the MPU, FEIS, and FSEIS all gave thorough consideration to the development of a runway with a length of less than 8,500 feet. A length of 8,500 feet was the recommendation because of the increased safety margin and the increased

flexibility for operations. The percentage of aircraft projected to be able to use various runway lengths was based solely on performance data listed in the operations manuals for the various aircraft types. The Port claims pilots prefer to avoid operating at maximum limits where other options are available. Regarding staggering the north end of the proposed runway from the existing runways, the Port believes this would reduce the operating capability of the new runway when air traffic control cannot maintain visual separation between an arriving and departing aircraft. The runways would need to be separated at least 100 feet for each 500 feet the landing thresholds are staggered to protect the separations between arriving and departing aircraft in the event the arriving aircraft executes an aborted landing. This need to increase the spacing would cause more wetlands to be impacted and realignment of more portions of Miller Creek. The Port states staggering the north threshold would prevent certain operations under air traffic control procedures in IFR conditions. The Port believes the even thresholds on the north are important to the operational efficiency of the airfield because the airport operates to the south (landing on the north thresholds) about 70% of the year because of weather. As for lowering the elevation of the north threshold, the Port claims the proposed design represents the lowest elevation that enables the connecting taxiways to meet the FAA's airfield design grade requirements.

The Port believes through the Flight Plan and Major Supplemental Airport Study and later through the MPU and the associated EIS process, the PSRC, the Port, and FAA have considered the full range of alternatives to the MPU projects, including alternatives to the third parallel runway. Alternatives examined included limited expansion of STIA, closure of STIA and development of a replacement airport, a multiple airport system including STIA, a remote airport functionally linked to STIA, demand management measures, new air navigation and airplane technologies, etc.

The Port stated the PRSC determined in 1994 a major supplemental airport was not feasible because of cost, opposition from air carriers, questions regarding long term need for a supplemental airport, support from a variety of groups for the concept of constructing at STIA, and lack of a local sponsor with an identified source of funds. The Port believes multiple airport solutions are not precluded from being explored because the proposed MPU projects are within the financial capability of the Port and expanded use of Boeing or Paine Fields can occur today, with no or limited financial expenditures at these facilities. However, the Port believes these options have not been shown to be a financially viable option from the airline's perspective so they have not been pursued. The Port points out any sponsors of a new supplemental airport would need to secure sufficient funding to make the airport functional. The Port also rejected using Boeing Field as a remote field because it would provide only limited capacity enhancements because of significant airspace conflicts. Boeing Field already relieves traffic from STIA by accepting general aviation aircraft.

The Port believes the advanced technologies described by the various commentors may help incrementally increase capacity and reduce delays. However, the Port believes the FAA re-affirmed on 23 January 2001 that no advances in aviation technology obviate the need for the third runway. In part, many of the proposals are

also in the research and development stage like the ADB-S with CDTI combination, which is not expected to be implemented until after 2010.

The Port believes the percentage of poor weather occurring at STIA was correctly calculated from NOAA weather. Weather from 1 January 1982 to 31 March 1992 was used in the analysis. To verify the accuracy of the weather analysis, additional analyses were performed using 26 years of historical weather data (1964-1991). The average from these 26 years was found to be equivalent to the 10-year average used in the EIS. The Port points out the IFR versus VFR conditions are based on those conditions actually influencing the use of either a single approach or a dual approach stream at STIA and not the general FAA rules; the conditions at STIA call for a more restrictive definition. "Sidestep" approaches are used to enhance operational efficiencies. As for the duration of IFR conditions, the Port believes a supplemental analysis (see Figure F-2 in Appendix F of the FSEIS) demonstrates 50% of all single approach conditions occur for six hours or more. The Port also points out poor weather at STIA tends to last for an extended duration during daytime hours, often during peak operating periods. Finally, the Port believes it is important to recognize delays are incurred based on the relationship between hourly demand and hourly acceptance rate. In the winter, the demand is less than in the summer peak months so the significant levels of aircraft delay are more a result of the lower hourly acceptance rate because of poor weather. In the summer, the higher hourly demand causes the significant levels of aircraft delay when there is poor weather.

Regarding demand management strategies, the Port believes these alone would not solve the region's air transportation problems. They will only provide incremental benefits to address poor weather delay all of which are significantly less than the benefits of constructing the third runway.

As for the Cleveland Hopkins International Airport, the Port believes this EIS has no bearing or relationship, as the conditions at STIA are different.

The Port points out local real property tax dollars are not used to fund the construction or operation of STIA. The money received via the Tax Levy are available for general Port purposes, but may not be used to pay debt service on Revenue Bonds. The Port believes the project has been the subject of extensive consideration of the project cost and benefit as directed by FAA in the *FAA Benefit Cost Analysis Guidance*.

District Engineer's Response. I also had questions regarding alternatives and requested additional information from both the Port and FAA on several occasions, which was provided. In their 2001 ROD, the FAA addressed concerns regarding more recent predictions regarding activity levels at STIA. In particular, they considered the variance between actual activity levels at the Airport and the levels forecast in the FSEIS and the implications of the 2000 Terminal Area Forecast (TAF). The FAA explained the difficulty in predicting the precise year in which an airport may be expected to reach a particular forecast level. They acknowledge the recent economic conditions have affected the growth in aircraft operations and passenger activity even

prior to September 11th. The FSEIS addressed this difficulty in predicting the year by performing a "what if" scenario to compare a faster growth rate with a lower-growth or constrained-growth scenario. As the TAF relies more heavily on national trends, it is a useful guide to projected airport activity, but is not adjusted to the specific conditions at STIA. The FAA believes it is reasonable to use locally developed forecasts for purposes of environmental evaluations of specific local improvements. Airport activity has been known to grow in a fashion that graphs as stairs – growing and then leveling off for a period before additional growth.

As for the Benchmark Report, the FAA explained the 1% flight delay of more than 15 minutes is in reference to the OpsNet data quantifying the number of flights delayed more than 15 minutes during any one of four operating phases. FAA Washington DC has readily noted the FAA does not maintain delay data in a way clearly quantifying delay associated with specific conditions. Therefore, when conducting planning for airport improvements, simulation data models are used to quantify the average delay per aircraft operation and enable the identification of conditions leading to delay.

In analyzing the model predictions, I asked FAA to explain how the operations data available today compares with the model predictions from the Airport and Airspace Simulation Model (SIMMOD). I also asked the Port to explain how the events of September 11th have affected their predictions and the amount of delay being experienced at the airport. In summary, the delay levels shown in the various operations databases are reasonably close to the level predicted by SIMMOD prior to September 11th. Post September 11th, the delays were reduced to 1994 levels, the point in time where delay levels indicated the need to explore alternatives. The delay numbers are beginning to increase and are expected to continue to increase. In their letter dated 7 August 2002, the FAA confirmed the "operational levels nationwide are expected to return to pre-September 11th levels sometime in 2003 or 2004." I used this information in my analysis of available alternatives (see Appendix B).

In the revised ROD, the FAA determined a new set of forecasts would not produce substantially different numbers for either of the forecast years and that any differences in forecasts would not substantially affect the analysis of environmental impacts and therefore, a new or supplemental EIS is not required. As the FAA is the Federal expert in forecasting aviation demand, I do not believe any additional studies are required and the demand and operations numbers used in the FEIS and FSEIS are appropriate for use in the alternative evaluation in the Section 404(b)(1) Analysis.

Regarding new technologies, the FAA is the Federal expert in the use and/or potential use of new technologies. FAA has considered alternative technologies to address the poor weather constraints at STIA including, but not limited to, passive final approach spacing tool (pFAST), LDA, GPS, TCAS, airborne information for lateral spacing (AILS), ADS-B, and CDTI. The FAA has determined these technologies will only provide incremental benefits all of which are significantly less than the benefits of constructing a third parallel runway. New technology and procedures are expected to provide an approximate 5% increase in hourly operating capability benefit, while the new runway

will provide almost a 50% benefit. The FAA stated in their 8 August 2001 ROD that "[w]hile the only prudent alternative to addressing the total poor weather problem is the development of the Third Runway; other technological improvements, as documented in the Final EIS and FSEIS, could be implemented that would increase the poor weather capability in a limited extent."

Regarding supplemental airports, the PSRC decision to include the third runway in the Regional Transportation plan was upheld in both King County Superior Court and Washington State Court of Appeals Division One (Case No. 42306-1-I). FAA's decision documented in their 3 July 1997 ROD was upheld in the Ninth Circuit Court of Appeals (Case No. 97-70953). The FAA also recognized in the FEIS "that commercial air service at an existing airport in the Region could be initiated at any time… However, such activity would not materially affect the demand at Sea-Tac and the resulting facility needs."

Regarding the request the Corps obtain more information on the overall cost of the project, the Corps did review the economics of the proposed actions as part of the public interest review (see Paragraph 9(P) above). However, this review is different from the use of cost in the 404(b)(1) alternatives analysis where the Corps does not consider the economics of the proposal in terms of the Port's financial standing, investment, market share, or economic viability. The Corps does consider cost regarding alternatives which are reasonable in terms of the overall scope/cost of the proposed project as compared to other alternatives. The Port did not claim cost was an important factor in comparing alternatives. This is in contrast to Resource Investments, Inc. (RII) (OYB-4-013996) where RII stated that cost was the defining factor for determining the practicability of an alternative. Therefore, in RII we compared the cost of one alternative against another and ultimately determined the costs of most alternatives were reasonable. For the Port, other factors were used to compare alternatives (see Paragraph 4 in Appendix B).

I have completed the necessary alternatives analysis, including the need for the project, and the details of my decision can be found in Paragraph 9(P) above and Paragraphs 3 and 4 of Appendix B. In summary, based on my review of the information provided by the Port, FAA, and the individual comment letters, I have determined the Port's proposed project represents the least environmentally damaging practicable alternative that meets the project purpose and need.

(10) Impact Assessment. Next to recommending denial, concerns about the potential impacts of the project were the most frequently raised issue. A few of the individuals commenting raised only general concerns about the overall impacts. However, the vast majority of the comments were about specific concerns. For ease in summarizing, responding, and addressing the concerns, the issues have been divided into the nine following topics.

***(a) Air Pollution*.** Several people requested an updated and more accurate air conformity analysis be competed because the FAA incorrectly exempted themselves

from the conformity provisions of the CAA by making a *de minimis* determination. They made this claim because they believed the current analysis is based on the false presumption that the same number of aircraft would come with or without the third runway. They believed this false assumption along with an unjustifiable modification of the fleet mix inaccurately concluded the NO_x levels in the future will actually be reduced. Furthermore, they believe because NO_x is emitted primarily during takeoffs, no amount of airport efficiencies can reduce the amount of NO_x emissions. They also stated the rest of the air pollution calculations are incorrect as taxi times and holding times are incorrectly reported. Concerns were also raised regarding inaccuracies in the capacity numbers (via benchmark study) showing that a Clean Air Conformity analysis should have been required.

A few people also questioned the absence of particulate data information in the air conformity analysis as all the values for jet aircraft particulate in the EDMS model are incorrectly, they claim, set to zero. They believed the particulate information from FAEED should be used in the analysis as well as the number and routes of haul trips of the trucks bringing fill. They also requested the Corps require the Port to complete the analyses stated in the Memorandum of Agreement (MOA) between the Port, FAA, EPA, and Ecology calling for an analysis of airborne soot or particles.

Questions were also raised regarding the accuracy of the carbon monoxide numbers as the same erroneous assumptions and wrong model data input have permeated the traffic analysis. They were unclear whether the development of the area north of the airport, including the North Unit Terminal Project and on-airport hotel, was included in the CO analysis, as the work already appears to have started.

Some individuals also reported more ozone exceedances occurred in 1998 than the Ecology reports indicate. They stated the monitoring site near STIA shows higher levels on average of NO_x, an ozone precursor, than all previous years monitored at the Beacon Hill site and there are increasing levels of NO_x present.

One person discussed the danger of blue ice falling from airplanes.[42] Several people were concerned about the serious health hazards associated with the dumping of jet fuel occurring when airplanes need to make emergency landings.[43] They believed this is detrimental to the development of our young and growing children.

Finally, some people referenced the Washington Department of Health and Seattle-King County Department of Public Health study showing higher incidence of respiratory illness and certain cancers near the airport. They reported the studies concluded there is a lack of information around airports in general, airport and airport related activities are potentially major sources of air pollution, and because of the lack of information on

[42] Blue ice is formed when the plane is flying higher in the air and the effluent waste freezes on pipes. When the plane descends for landing, the warmer air melts the ice and the waste falls to the ground.
[43] The fuel can condense into a cloud and then rain down on people living around the airport.

specific air pollutants, we cannot rule out the possibility that air pollution around STIA affects the health of the residents. They believed at a minimum, the Port needed to use a portion of the landing fees to cover the costs of a multi-year air pollution study recommended by the studies.

Applicant's Response. The Port believes the FAA has made the correct *de minimis* determination and concurrence was received from EPA, PSAPCA, and Ecology. Further more, they pointed out the Governor issued a certification stating the project will be located, designed, constructed, and operated in compliance with applicable air quality standards. They believe the conformity evaluation considered the NOx emissions associated with the project and determined they were less than *de minimis* and correctly determined no additional analysis was warranted.

The Port states the FAA has determined the results of engine testing for particulate matter emissions from airplanes used in earlier versions of the EDMS computer model are not accurate and cannot be used. At this time, the FAA and EPA have not updated the particulate data because no reliable data on aircraft particulate emissions is available to incorporate into the model. As for particulate emissions from construction activities, the Port believes the FEIS and the DSEIS provide a detailed analysis.

The Port believes the CO concentrations measured in 1996/97 as part of the MOA, demonstrated conclusively the emissions are less than the NAAQS. The Port states projects outside the first five years of development of the MPU will be reviewed for air conformity, including CO emissions, as they become further defined; these projects include the North Terminal and on-airport hotel.

The Port believes fuel dumping, or the purposeful jettison or leakage of aviation fuel by aircraft as they approach or depart the Airport, is not common and is performed only in emergency situations when aircraft cannot land safely with the fuel present in the aircraft. They are not aware of any restrictions as to where the aircraft may or may not dump fuel. However, each airport has a recommended, pre-designated fuel dumping area for instances where fuel needs to be dumped if time permits. At STIA, FAA traffic controllers have been instructed to direct aircraft in need of fuel dumping to fly above 5,000 feet over the Puget Sound to allow time for the fuel to evaporate before reaching the ground, and to prevent non-evaporated fuel from reaching populated areas. The Port has requested fuel-dumping information from the FAA. However, the FAA noted there are no records kept concerning fuel dumping, and therefore, it is not possible for the Port to confirm any incidences of fuel dumping.

Regarding health issues, the Port is cooperating with the various local and state agencies to determine whether pollution from STIA affects the health of nearby residents. The Port points out the studies have found the rate of brain cancer around the airport is not higher now and that overall cancer risk is normal. They do acknowledge the studies report there are indications respiratory diseases are higher around the airport but also point out there is not enough information to know which of the risk factors are most important.

District Engineer's Response. The FAA is the Federal lead regarding air conformity determinations for airports as they are the Federal experts regarding the operation of airports (40 CFR Part 93). As a signature of the MOA, they and EPA also are responsible for ensuring the studies required have been completed. I have reviewed the FAA's air pollution analysis presented in the NEPA documentation, including the response to comments, the comments made during the Corps process, and the ROD and do not find any reasons to disagree with the FAA's determinations. Therefore, I concur with the FAA's *de minimis* determination for air conformity (see Paragraph 9(T)(4) above for additional discussion).

(b) Noise Pollution. Several people questioned the Port's contention that no noise impacts will result from the proposed third runway as this determination results, in part, from the Port using the wrong baseline for measuring impacts. In particular they believe the Part 150 study used the STIA noise contours before the FAA's Stage-3 noise requirements took effect and thus, inappropriately showed a reduction in noise generated by operations. They believe the appropriate baseline would be after the Stage-3 requirements went into effect. One person also raised a constitutional question whether the Federal government or the State Government is legally responsible to protect the public under FAR 150.

Another issue raised was the public projects involving Federal funds have an obligation to follow provisions of Public Law 91-646, which provides for fair market value compensation for taking private property rights as well as relocation services to affected property owners. Individuals believed the Port has failed to consider the "taking" which occurs through increased noise.

Several people complained the noise from the aircraft is affecting the hearing of the people who live in the flight path, making it difficult to teach students in the schools, making property values decrease, etc. They believed the Port is notorious for not following through on their obligations to the neighborhood and has yet to complete mitigation requirements for the construction of the second runway. In particular, the schools in the Highline School District have yet to be insulated properly as required by Federal Law.

One person also believed the presence of the MSE wall will reflect the noise from the adjacent freeway towards the most densely populated parts of Burien.

Applicant's Response. The Port believes the existing noise conditions are adequately discussed in the FEIS and the FSEIS. Further, the Port has maintained a longstanding commitment to address existing and future noise conditions from aircraft operations at STIA. The Port believes their existing Noise Remedy Program has and will continue to provide noise insulation, transaction assistance, acquisition, and relocation mitigation for the residents around the airport. The Port updated its Part 150 Noise Compatibility Plan in 2000 and issued a SEPA checklist and determination of non-significance for the recommendations contained in that plan. The Port believes the correct baseline was used in the analysis as the existing conditions represented conditions in 1994, when

Stage 2 aircraft were legally allowed to operate. The Port last updated the noise plan in 2001 and will perform the next update in 2007.

District Engineer's Response. The FAA has the authority to assess noise pollution and make noise mitigation recommendations for airports. In their revised ROD, the FAA determined "the noise analysis in the Final Supplemental EIS is still substantially valid," "the mitigation commitments of the Port sufficient", and will require "the Port to develop a new noise analysis upon commissioning the runway and to identify mitigation based on actual operational characteristics." I have reviewed the information presented in the NEPA documentation, including the response to comments, the comments made during the Corps process, and the ROD and do not find any reason to disagree with FAA's ROD findings regarding noise. Therefore, no further review or mitigation by the Corps is necessary.

***(c) Socio-Economic*.** Several people raised the concern that the Port's analysis of social and economic impacts is inaccurate and flawed. They base this concern on the fact the Port contends the third runway will both have no economic or social impacts if it is built and will hurt the local and regional economy if it is not built. The Port's contention there will be no impacts is based on the claim there will be no additional enplanements or operations at STIA whether or not the proposed third runway is built because the only purpose of the proposed third runway is the elimination of poor weather operating delays. However, the individuals questioned how the local and regional economies can then be harmed if there will be no more enplanements or operations as a result of the project. They further state the only beneficial data presented by the Port are the fuel related cost savings associated with aircraft not having to circle STIA during poor weather. They also believe the analysis of the third runway's benefits should include an assessment of the operations and enplanements likely to be shifted to a new regional airport.

A few people also believe there is little support for the Port's claim the airport expansion will generate a special 'bundle of benefits' to the surrounding communities. They believe the increased noise impacts will reduce the housing values of the communities surrounding the airport based on the fact single-family home prices and land values in the immediate vicinity of STIA increase less rapidly than elsewhere in King County. They further claim the property-value losses in the five surrounding communities will cost owners an estimated $2.3 billion dollars and the communities will loose $4.0 million annually in foregone property tax revenues. They also believe research shows few residents in the surrounding communities have jobs or commute to work at STIA and they get little benefit from access to air travel because they use it infrequently.

One person also pointed out there is no evidence the Port has separated STIA's National Economic Development (NED) and Regional Economic Development (RED) benefits. They state the Port has never undertaken an analysis following Corps methodology to demonstrate the runway's NED benefits exceeds its costs.

A few individuals also state the Corps needs to ensure the proposed project complies with EO 12898 regarding environmental justice. In particular, the Corps must ensure the communities surrounding the airport have not suffered a disproportionate environmental risk as a result of underenforcement of the environmental laws. The Corps also has to ensure the community members have had the opportunity to participate meaningfully in the environmental decisionmaking that may affect them. Thus, they question why the public has been excluded from participating in meetings between the Port and the Corps.

Applicant's Response. The Port believes the FEIS and FSEIS have identified all significant adverse environmental impacts from the proposed improvements in accordance with FAA orders and NEPA requirements. They believe the FAA and the Port have taken reasonable steps to identify mitigation measures to minimize the impacts of the proposed improvements. They state the forecast analysis has shown there will be a slight difference between the "with Project" and "Do-Nothing" alternative. They believe extensive comments and responses have been provided regarding the forecast methodology and were the subject of litigation by the ACC and point out the court upheld the forecasts and the adequacy of the FSEIS. Finally, as stated in both the FEIS and FSEIS, they believe the proposed improvements will not affect the variables that define demand, population, per capita income, and airfares.

The Port continues to assert in general that communities closer to airports receive benefits from the airport in greater proportion than communities further away. They state the analysis in the FEIS in support of this claim is based on industry-accepted means of evaluating socio-economic impact of airports. They point out the Port's existing Noise Remedy Program has already compensated residents for any such loss in property values and any further changes in noise exposure area will be mitigated as part of the noise/land use mitigation identified in the FEIS and FSEIS. Further, they believe the reduction in property values, or a slowing of appreciation, were typically felt when the Airport first began jet service or as a consequence of larger changes in conditions, until such time as those changes were known and were captured by the marketplace. As jets have operated at STIA since the early 1960's, they believe the primary adverse effects on property values would have been experienced by this time.

They point out the Federal grant process requires conducting the benefit cost evaluation that was included in support of the Port's Letter of Intent application. The evaluation was prepared subject to Federal guidelines adopted by FAA.

District Engineer's Response. For the purposes of the Corps' public interest review, "it will generally be assumed that appropriate economic evaluations have been completed, the proposal is economically viable, and is needed in the market place" (33 CFR 320.4(q)). Nevertheless, I have reviewed the information submitted regarding need for the project and find no reason to depart from the assumption that the project is needed. The information shows there is a clear pattern of increased delay and increased congestion during poor weather conditions. Therefore, the Port has demonstrated a need for the project (see Appendix B Paragraph 3(b)). The economic benefit review

performed by the Port and FAA concentrated on impacts to local communities based on property values and revenue losses (see FEIS, Chapter 4, Section 8). Regarding NED analysis, these are used for Corps and other Federal agency water resource planning projects and are not applicable to the Corps' Regulatory authorities (for further information see the Water Resource Planning Act of 1965 and Engineering Regulation Guidance 1105-2-100). I have reviewed all of the benefit cost information provided and find the changes in the project since the last update in 2000 are not contrary to findings in the FAA's initial analysis in 1997 (see Paragraph 9(P) above). Therefore, the proposed project is determined to still be cost-beneficial.

Regarding compliance with EO 12898, I have completed a review of this issue (see Paragraph 9(I)(3) above for details). As part of gathering information to make this determination I have afforded the public numerous opportunities to comment on the proposal and participate in public hearings. I also have participated in multiple meetings with the community organizations, ACC and RCAA, representing the communities around the airport. My staff has also met with several individuals and concerned groups requesting a meeting to discuss their various concerns. I have concluded the proposed project is in compliance with this executive order.

(d) Traffic. A couple of individuals believed the Port does not address the impact on the surface streets and highways with the additional numbers of truck and trailer trips required to haul the 20-plus million cubic yards of fill dirt. This would require some 3,000 additional trips daily on highways already jammed up with traffic. Some asked who would pay for the additional road repair and the time lost by businesses and vendors for longer waits in the traffic jams as this is a major impact to the environment and communities that must be considered.

Applicant's Response. The Port believes Chapter IV, Section 15 of the FEIS and Section 5-4 of the FSEIS adequately addressed transportation impacts.

District Engineer's Response. The FAA has prepared a thorough analysis of traffic impacts in both the FEIS and FSEIS. They determined no surface transportation project-related mitigation would be required. I have determined their analysis is adequate and therefore, no further review by the Corps is required.

(e) Wetlands. Many of the people commenting on the wetland impacts were concerned about the overall impacts to wetlands especially because of the past losses in the basin. Many also questioned the adequacy of the wetland delineation. They were concerned an adequate assessment of impacts could not occur if all of the wetlands had not been identified.

Many also believed the proposed project will have far greater permanent impacts on the downstream resources because of the possibility of the mitigation failing. They claim research has shown the incidence of mitigation failure is often linked to poor design, poor installation, and no follow-through by the permitting agencies to assure the designed plans are installed properly. They believe none of the resource agencies for

this project have the staff time or budget to commit one or more staff to the long-term construction oversight role this project will demand if it is permitted.

Several regionally recognized wetland experts also provided numerous comments. Many of their concerns are addressed in and influenced my review of the proposed mitigation plan as can be read in Appendix C. Some of their specific concerns are as follows:

- A wetland functional analysis is missing and the wetland assessment is unsupported as a result. The omission has resulted in a mitigation plan replacing the wrong functions. For example, waterfowl habitat and flood storage are proportionally the lowest-ranking functions among the wetlands to be eliminated, yet they are the primary functions targeted for replacement in the NRMP. The NRMP also misstates the majority of the wetlands to be eliminated are degraded to the extent they provide few valuable functions. Analysis of the Port's data shows the majority of the wetlands to be impacted in Miller Creek, for example, are rated as Class II wetlands rather than lower quality Class III and IV.
- One particular function that has not been properly evaluated is the contribution of the wetlands in Miller and Des Moines creek watersheds to primary productivity in the creek systems. The wetlands in these watersheds are extremely important because of their value for production of organic carbon and for their role in moderating nitrogen export. Reduction and/or changes to the wetland plants in the watershed could result in increased eutrophication in the shoreline environment (related to the amount of nitrogen) and shift the food web from detritus consuming filter feeders to phytoplankton production (related to the amount of organic particulate matter). Changes in these two areas could have a subsequent effect on fish. The amount of dissolved organic carbon in the creeks will also affect the biological availability of zinc and copper found in the stormwater runoff.
- Calculations of the extent of temporary impacts is unscientific, contrary to common sense, and under-estimates the extent and permanency of secondary impacts. The Port claims there is a one-for-one relationship between the amount of acreage loss and the amount of function remaining. This may be true within some ranges of values. However, there is ample evidence that as wetland size diminishes, the value of the wetland decreases in greater proportion because the remaining functions are qualitatively less significant. For example, arguing the same functions present in a 9.3-acre wetland will proportionately scale down on a one to one ratio within a grossly reduced 1.4-acre wetland defies logic. Timelines have also not been identified regarding "temporary" impacts. Extensive delays encompassing initial impact, use during construction, and final restoration effectively eliminates habitat use of the area for a decade or more. For example, placing the sediment control ponds in wetlands could impact sub-surface hydrology and thus impacts wetlands and streams downslope. Even though discussions state the areas will be restored, there are no detailed plans as to how this will be accomplished and how the shallow interflow from groundwater will be effectively re-established. Therefore, the total of permanently impacted wetlands should be considered to be 21.33 acres.

- The headwaters of Walker Creek are incorrectly and inconsistently reported which makes it very difficult to accurately assess impacts. The December 2000 Wetland Delineation Report correctly shows there are three tributaries to the start of Walker Creek within Wetland 44. The headwater wetlands and tributary seeps that make up the headwaters to Walker Creek have an important ecological and hydrologic role in maintaining function in a creek system and need to be protected.

The PCHB decision also raised concerns regarding the credit given to the Port for enhancing the surface of Lora Lake, upland buffers, restoring the prior converted croplands at Vacca Farms.

Applicant's Response. The Port believes sufficient information regarding the area of wetland loss, functions provided by the impacted wetlands, and mitigation to replace and/or restore those impacted functions has been provided in numerous documents. The Port believes the mitigation has been specifically targeted at replacing all wetland functions impacted by the project described in the *Wetland Functional Assessment and Impact Analysis* report. They believe the analysis correctly documents the wetlands to be eliminated are degraded, and their ability to provide most of the functions analyzed is significantly reduced because of the historical wetland degradation. The Port believes Ecology's rating system is not a functional assessment and therefore, cannot be used to determine the loss of wetland functions. It is the Port's belief the mitigation as designed will restore degraded wetland, stream, and stream buffer areas to higher levels of ecological function for the broad range of functions impacted. Functions targeted at the Auburn site are waterfowl, passerine bird, and small mammal habitat because of potential of wildlife being struck by airplanes. The remainder of the functions being impacted will be mitigated for in-basin.

The Port believes the mitigation has been carefully planned to avoid the problems discussed in the various research studies and has incorporated many of the recommendations. As required by Ecology and the Corps, the Port will prepare and submit detailed monitoring reports to determine if the mitigation is successful.

The Port states the proposed mitigation will restore wetlands adjacent to Miller and Des Moines creeks currently dominated by turfgrass or farmland with forested or shrub vegetation, thus greatly increasing organic carbon export. They also believe the replacement of the ditches and channels on a 1 to 1 basis with vegetated buffers along the channels will help to ensure the organic matter export functions of the wetlands would remain similar to their predevelopment condition. The Port believes the proposed mitigation at Vacca Farms, the Miller Creek riparian wetland and buffer enhancement, and the Tyee wetland mitigation areas will all deliver organic matter to in-basin streams. Therefore, the Port believes a shift in food webs will not result from the construction of the MPU improvements.

The Port believes the methods used for evaluating permanent and temporary impacts are consistent with agency guidance and are based on an analysis of the specific areas impacted by project construction, the timing of construction, construction methods, pre

and post-wetland conditions, and the operation of the projects. The Port believes their approach of considering the impact proportional to the loss of wetland area is conservative and protective of wetlands resources and that project information demonstrates for several wetland functions, resident and anadromous fish for example, reductions in wetlands size will result in little or no impact to these functions. They believe the hypothesis that by reducing the size of a wetland, one removes significant value in greater proportion than the percentage of lost wetland area is not borne out by an objective evaluation of pertinent data. However, the Port does agree where temporary fill in wetlands results in small fragments of remaining wetlands, the remaining wetland area should be, and have been, considered permanently impacted. If the wetland to be restored could be integrated into adjacent wetland areas or buffer mitigation, the Port considered the impacts temporary. As for the temporary stormwater ponds, at Pond A for example, the revised design calls for a sheet pile wall to isolate the pond from the surrounding water table and wetland hydrology. A gravel-filled trench is planned to convey groundwater flow around the sheet pile wall and allow it to re-infiltrate on the downgradient side of the pond. Restoration plans for these areas are described in the *Natural Resource Mitigation Plan*.

The Port explained the portion of Wetland 44 to be impacted is located upslope of any perennial seep or streams. The portion of the wetland to be filled has channelized flow, primarily due to stormwater runoff from streets that are concentrated by ditches and culverts. They state in the future, stormwater runoff from the MPU projects will be collected, treated to meet water quality requirements, and released gradually from detention facilities to reduce peak streamflows in Walker Creek. Furthermore, they believe groundwater discharge functions will be maintained by the design of the embankment fill.

District Engineer's Response. The final delineation and the accepted boundaries of the wetlands are documented in the Corps' *Memorandum for Record: Field Review and Jurisdictional Summary* dated February 2001. These wetlands boundaries are those shown in the final public notice dated 27 December 2000 and used in my independent impact analysis.

I also had questions about the proposed compensatory mitigation and asked for and received additional information, clarifications, and revisions. I have completed an independent functional assessment to determine the potential impacts from the proposed project. My review is documented in Appendix C (see also Paragraph 9(A) above for additional discussion). Based on this assessment, and considering the information provided by both the Port and the regional experts commenting on the project, I have determined the wetlands impacts have been adequately mitigated and the net individual and cumulative impacts are minimal.

Regarding assigning credits, I based my decision on functional replacement rather than acreage to meet the program goal of no net loss of functions and values. Regarding the use of functional replacement rather than acreage, the 1990 Mitigation MOA between the Corps and EPA states mitigation should provide a functional replacement

and absent specific information, acreage replacement can be used. As the Port did provide detailed information regarding functions and I performed an independent functional assessment, a determination of the adequacy of the mitigation on a functional basis is appropriate. As documented in Appendix C, I gave partial credit for the buffers, the work in and around Lora Lake, and the mitigation work at Vacca Farms as they all contribute to the overall functionality of the proposed mitigation. For additional discussion regarding the PCHB decision, see Paragraph 9(A) above.

As for holding the Port accountable for the mitigation as proposed, compliance with the mitigation plan is a special condition of the permit (see Paragraph 12(M) below). I have also already committed the staff time and budget to ensuring not only this project, but all mitigation projects for any permits issued are implemented as designed. I have a computer program that keeps track of when monitoring reports are due and when they have not been submitted, a message is sent to the project manager reminding them to request the necessary reports. I have also directed my staff to review every report submitted and at least once during the monitoring period visit the mitigation site in person. If more visits are necessary based on the complexity of the project and/or the results shown in the reports, my staff will make the necessary visits and corrections.

***(f) Fish habitat*.** The majority of the comments received were general concerns over impacts to fish and fish habitat. They believed the impacts to fish habitat are not addressed especially the removal of 980-feet of invertebrate community from relocating Miller Creek.

Several people also believed the proposed project could impact natural salmon spawning runs and impact other salmon in Puget Sound. They believed it was not appropriate to allow this destruction of salmon habitat when so much time and money is being spent in the Pacific Northwest to try and bring the salmon back from the brink of extinction.

One person also believed mitigation should be considered for restoring much of Miller Creek's upper reaches to salmon spawning. For example, no discussion of removing the natural waterfall upstream of S 160th Street or installing a fish passage structure has been included.

Several fisheries biologists also had the following specific concerns.

- The design standards for the Miller Creek realignment work do not reference scientific information and the Port has not recently undertaken a quantitative fisheries survey in Miller Creek.
- The temperatures will be too high for cutthroat until shade is established (3 – 5 years) and oxygen could thus be depleted.
- A minimum flow depth of 0.25 feet during 0.5 cfs summer flows cannot be accomplished and the high porosity of the spawning gravel without the presence of fines may cause the stream to go subsurface during low flows.

- A low flow depth of 0.15 feet was calculated, which might limit the movement of all but the smallest fish and increase temperature.
- The proposed removal of man-made structures will improve fish habitat. However, the question remains whether the overall project and the LWD installed to stabilize the bank will be a net enhancement, or even remain during storm events.
- The Port has not provided the basic information detailing the status of fish populations in the streams and an adequate quantification of existing stream conditions. There is no estimate of variability associated with the baseline conditions. In addition, invertebrates, using the Benthic Index of Biotic Integrity (B-IBI), will be the only stream biota monitored during the monitoring period and B-IBI cannot be used to unequivocally assess the effect of mitigation actions.
- The Port has determined the project will have short-term effects on the habitat of coho salmon but does not define "short-term". If coho will be impacted, then the project will certainly impact the habitat of cutthroat trout, pumpkinseed, and other species. Even if the BMPs work as designed, there most likely will be some increased input of sediments during construction and storm events which could impact redds and adversely affect the fish habitat.

Applicant's Response. The Port believes the proposed mitigation will restore natural channel morphology and high quality in-stream habitat to a degraded and artificially channelized reach of Miller Creek.

The Port's responses to the specific concerns of the fisheries biologists are as follows.

- Potential impacts to aquatic and fish habitat have been documented through numerous studies, including habitat and fish use, and findings from the studies have been used to plan and design the mitigation. In particular, habitat requirements for cutthroat trout were used to help design the physical parameters of the stream channel.
- The Port believes immediately after construction, the relocated channel will likely have no less shading than the channel in its current condition and after a few years of growth, the shading will be significantly improved. The placement of new woody debris (where none is in place now) will improve re-aeration of the stream and enhance dissolved oxygen levels.
- Fine sands and silts will also be included in the "spawning gravel" stream material to reduce the high porosity of the gravel and avoid dewatering of the stream during low flows.
- The flows depths in the creek are based on open channel calculations for the proposed relocated stream. Monitoring of water table elevations in the Vacca Farm show the proposed channel flow line is at the same approximate elevation as the minimum water table elevation. Therefore, the Port believes the calculated flow depths will be met.
- There may be some short-term localized sediment movement as the stream channel stabilizes after the restoration work is completed. However, the channel enhancements, when combined with the proposed hydrologic improvements that will

reduce the magnitude and frequency of channel-forming flows will improve the overall health of the stream.

- B-IBI is just one method the Port will be using to monitor and evaluate the success of the proposed mitigation. While B-IBI may be ineffective in measuring the invertebrate response to specific actions at a specific site, it does provide a powerful tool for assessing overall stream health.
- The short-term effects on coho habitat were described as short-term water quality impacts (increased turbidity and sediments) that could occur during construction if temporary sedimentation and erosion control BMPs are not effective. Compliance with the terms and conditions of the NPDES permit will reduce the probability of such impacts occurring. The proposed mitigation retrofitting water quality BMPs, reducing flood flows, and enhancing creek buffers will all serve to improve conditions and enhance survival, growth, and abundance of fish and other aquatic organisms.

District Engineer's Response. I also had questions about the potential impacts to fish habitat and therefore, asked for and received additional information. I have completed a thorough review of the proposed project including the potential impacts and the proposed mitigation, including stream realignment and restoration work. As documented in Appendix C, I have determined the proposed mitigation adequately addressed and compensates for the proposed impacts to fish (see also Paragraph 9(B) above for additional discussion). The necessary ESA and EFH coordination has also been completed (see Paragraphs I(1) and (2) above). The USFWS concurred with the "may affect, not likely to adversely affect" determination for the bull trout and the NMFS concurred with the same determination for chinook.[44] Compliance with the mitigation plan, the conservation measures in the BA, and the measures in the BO are special conditions of the permit (see Paragraph 12(M) below). None of the conservation recommendations were added as special conditions to the permit (see Paragraph I(1) above for a discussion why they were not added).

(g) Wildlife. The majority of the comments received concerning wildlife were regarding the presence of birds in the vicinity of the airport. Many believed the Port is using a non-existent wildlife hazard situation as an excuse for poor wetland mitigation and offsite mitigation. They requested that a more detailed analysis of potential problems related to providing mitigation sites outside of the 10,000-foot boundary be performed. They state the WHMP is incomplete and fails to provide a basic picture of bird-airplane collisions, baseline information, and methods used by the Port to determine the number of strikes. Therefore, they conclude the WHMP does not offer a predictive picture of the impact of the proposed project.

A couple of people believed the baseline information for bald eagles and marbled murrelets was incomplete and therefore, no mitigation for potential airplane strikes for

[44] See the USFWS Biological Opinion dated 22 May 2001 and the NMFS letter of concurrence dated 31 May 2001 for details of their determinations.

both species was proposed. Furthermore, impacts of construction were not addressed relating to bald eagle nesting and foraging. They stated the surveys performed were completed during the wrong time of the year to assess eagle movements during the breeding season and post-fledging period. They requested additional studies be completed for the time frame between the 1995 EIS baseline work and the 2000 release of the BA. They believed future increases in bald eagles should be anticipated and presented in a plan to mitigate for impacts. They also believe information has not been provided demonstrating that marbled murrelets do not occur along the marine shoreline adjacent to the airport or do not fly across the airport from nesting sites to the marine waters.

Concerns were also raised regarding the elimination of the large acreage of upland thus reducing migratory bird nesting and migrating habitat in the area. People believed the development and/or redevelopment of approximately 700 acres of uplands will result in further decline of species already impacted by development in the area. They stated no studies have been completed on the birds in Miller and Des Moines creeks and that many of the species impacted are listed under the Migratory Bird Treaty Act or are species of concern. They believe the Miller Creek basin offers one of the last refuges for migratory birds in the Puget Sound area.

A couple of people also believed the design of the MSE wall needed to be examined as an attractant for soaring birds and the potential for increasing plane strikes. They believe with the prevailing wind coming from the southwest, a variety of bird species could use the uplift created by the retaining walls.

One person also commented the nearshore bird populations will be impacted by the reduction in stream transport of organic carbon and detritus. They referenced studies clearly documenting that birds are strongly tied to estuarine food webs and therefore, decline in organic carbon and detritus will directly translate into losses of available food to dozens of species of migratory birds.

Applicant's Response. The Port believes the bird-aircraft strike record at STIA demonstrates that wildlife hazards have existed at the airport since at least 1977. Since the 1980's the Port has staffed a full time wildlife biologist at the airport to assist in reducing and managing wildlife hazards. The Port believes the WHMP meets FAA requirements and the reporting requirements made as part of the plan follow the FAA guidelines.

The Port believes the BA adequately discussed both the bald eagles and marbled murrelets identified as being present in the action area and the potential effects from habitat alterations, disturbances from construction, and potential strikes. They believe the information provided supports the determination of "may affect, not likely to adversely affect" for these species. They state eagle movements across STIA were examined both during breeding and non-breeding seasons. They believe the proposed MPU projects will not result in removal of high quality bald eagle nesting and foraging habitat and will not affect the potential for increases in eagle populations near the

airport. They agree while it is true that current flight routes across the airport by marbled murrelets are unknown, it is also known that no aircraft strikes for murrelets have been recorded between 1979 and 1997.

The Port believes the analysis of habitat impacts to birds provided in the NEPA and SEPA process adequately addresses the impacts to avian habitat and mitigation for the impacts. They believe the tendency for many migratory and resident birds to disperse widely and use urban habitat for breeding and migration demonstrates that migration corridors will not be eliminated and that large amounts of marginal urban habitat suitable for use by migrating birds will remain following MPU project development.

The Port agrees if prey is available on the airport operations area, birds could use these uplifts and forage over the airport operations area for extended periods. However, management of prey species on the airport operations area and other wildlife management actions are implemented to minimize soaring and foraging birds near the airport operations area, regardless of whether they are using uplifts or not.
The Port believes the restoration and revegetation of stream buffers and riparian wetlands would increase input of organic matter to Miller and Des Moines creeks. Therefore, they believe no reduction in organic matter in the downstream estuaries would occur.

District Engineer's Response. I also had questions about the potential impacts to wildlife, especially avian habitat. I asked for and received from the Port additional information. I have completed a thorough review of the proposed project including the potential impacts to wildlife and the proposed mitigation. As documented in Appendix C, I have determined the proposed mitigation adequately addresses and compensates for the proposed impacts to wildlife (see also Paragraph 9(B) above for additional discussion). The necessary ESA coordination has also been completed. The USFWS concurred with the "may affect, not likely to adversely affect" determination for both the bald eagle and the marbled murrelet.[45] Compliance with the mitigation plan and the BA are special conditions of the permit (see Paragraph 12(M) below).

***(h) Indirect Impacts*.** The majority of the comments received regarding indirect impacts raised the concern that many wetlands have already been impacted by the work already occurring on site. They point out several wetlands have been partially surrounded by fill and construction activities and many acres of upland forests have been cleared which also indirectly impacts wetlands. They believe these activities have reduced and continue to reduce the value of the wetlands, especially those to be preserved, possibly eliminating normal functioning within these wetlands for decades. They conclude the proposed construction activities will add to these impacts by altering hydroperiods, altering substrate conditions, and possibly impacting water quality and requested all of these impacts be considered.

[45] See the USFWS Biological Opinion dated 22 May 2001 for details of their determination.

Numerous concerns were also raised regarding the borrow areas. They believe because Borrow Sites 1, 3, and 4 are currently mostly undeveloped and covered by upland coniferous forest and wetland second-growth deciduous forest, clearing these trees and excavating the borrow areas will significantly alter land cover, affecting infiltration, eliminating evapotranspiration and generally reduce the contribution of precipitation to groundwater. They believe this will have a long-term effect of reducing seepage flows and diminish base flows in Des Moines Creek. Also, they believe several wetlands in the borrow areas and downstream of the proposed work could be indirectly impacted by the changes to hydrology. They also believe the information made available for the borrow areas should include the locations and depths of the land to be mined, the topographic layering and time frame expected for restoration, and the long term use of these lands. They also requested an assessment of the ecological and hydrological impacts associated with the mining, restoration, and long term use of the borrow areas be completed. Issues regarding the long-term plans were also raised. Some believed if future development plans are known at this time, then those potential impacts need to be addressed at this time.

Concerns were also raised that using the borrow areas could have a negative impact on the Highline Aquifer located in the Des Moines Creek basin. They believed the aquifer could also be impacted from saltwater intrusion as a result of the proposed runway project. Many of the aquifers are charged by rain stormwater from the surface providing a positive pressure to renew the water supply. Therefore, they are concerned that getting rid of the surface waters needed to charge up the wells will impact the available water supply.

A concern regarding the temporary SR 509 interchange was also raised. A few people believed the maps were inaccurate and the temporary interchange may actually impact wetlands. They requested construction be stopped until this issue is resolved. In addition, they requested the indirect effects of this proposal be evaluated including the discharge of sediment-laden stormwater from both expected and unexpected stormwater events that could impact Wetland 43.

Applicant's Response. The Port has not performed any work in wetlands and the Port believes the work is being conducted so as to be protective of nearby wetlands. Protection actions taken by the Port include a minimum 50-foot buffer between construction activities and the wetlands, sediment and erosion control measures, and installation of security fences.

The Port also believes the impacts from using the borrow sources and the Port's plan with respect to restoration of the borrow sources are addressed in the *Port Re-Evaluation Document* and *Resource Evaluation and Conceptual Development for Borrow Areas 3 and 4*. The borrow areas are covered by a variety of vegetation types including blackberry, abandoned residential landscaping, and remnant areas of second growth forest. The borrow areas will not be completely cleared of vegetation. In many cases wetlands have been preserved and buffers will be left around the perimeter and adjacent to wetlands. Post-excavation, the borrow areas will be revegetated and will

have gently sloping grades, which will locally enhance infiltration. The revegetation will help to ensure evapotranspiration will not be eliminated. Therefore, the Port believes the design of the excavation plans and performance standards for the borrow areas will maintain wetland functions and the existing hydroperiod for the wetlands and streams in the basin. At this time the Port does not have any plans for redevelopment of the borrow areas. However, the Port does have an agreement with the city of SeaTac to pursue such redevelopment in the future. If plans are developed in the future, the applicable permits will be obtained.

As for the Highline Aquifer, the Port believes the impacts were adequately considered in various studies, which concluded that the small reduction in groundwater recharge to deep aquifers of the Des Moines upland would not materially affect the ability of these aquifers to supply water to wells.

The Port believes the maps for the SR 509 interchange accurately depicted the wetland boundaries and no wetlands were impacted during construction of the interchange.

District Engineer's Response. With the exception of three minor violations, the work performed by the Port to date has not resulted in any direct impacts to wetlands.[46] In performing my impact assessment, I used the conditions of the property prior to any stockpiling or land clearing occurring as the baseline conditions.

I also had questions about potential indirect impacts so I conducted my own analysis as discussed in Appendix C. In summary, the potential indirect impacts I considered in my analysis include a shift in the organisms and structure of food chain support, changes to the hydrologic regime of the adjacent wetlands and streams from the MSE walls and embankment thus affecting fish habitat and the existing wetland vegetation community, and elimination of organic carbon sources. To ensure there is adequate monitoring of the wetlands to identify if any unforeseen indirect impacts occur the following two special conditions regarding delineation of wetlands and hydrological monitoring will be added to the permit.[47] These conditions provide more detail as to what the NRMP is requiring for monitoring of wetland indicators, including areal extent of the wetlands and wetland hydrology.

a. All of the "Delineated Wetlands Verified by ACOE" as shown on Sheets 3 and 4 of the permit drawings that are not being filled as part of this permit will be redelineated in mitigation monitoring years 5, 10, and 15. For those wetlands where the NRMP proposes to expand or otherwise modify the existing wetland boundaries, the post mitigation construction wetland boundaries must be delineated to insure the area of the new wetlands at least equals the proposed NRMP wetland area. Maps will be included in the yearly mitigation monitoring report and provided to the U.S. Army

[46] See footnote 33.
[47] See Paragraph 9(A) above for additional discussion for the PCHB conditions regarding the hydrology monitoring and redelineation of the wetlands.

Corps of Engineers, Seattle District, Regulatory Branch. If the size of any of the wetlands have decreased, additional mitigation may be required. There is one exception to this condition: 1) The boundary of Wetland 43 will not be redelineated because there are no anticipated indirect impacts.

b. To monitor for the occurrence of any unforeseen indirect impacts and to identify potential adaptive management strategies, the monitoring protocols outlined in the memorandum titled *Changes to groundwater monitoring protocol in wetlands adjacent to Master Plan Construction Projects* dated 28 October 2002 will be implemented. Results of the monitoring will be included in the yearly mitigation report and provided to the U.S. Army Corps of Engineers, Seattle District, Regulatory Branch.

I also had questions about the potential indirect impacts to Des Moines Creek from the construction activities in the borrow areas. Therefore, I have performed an independent evaluation of the potential indirect impacts. As described in the Corps' *Hydrological Review – Borrow Areas* (Corps, 11 August 2002) the seasonal low flows should be improved due to increased groundwater storage and increased baseflow.

Regarding possible future development in the borrow areas, there are no reasonably foreseeable future projects planned for the borrow areas. If the Port develops plans in the future, if wetlands or other waters of the United States will be impacted, then coordination with the Corps will be necessary.

I have also independently reviewed the potential impacts to aquifers (Corps, 31 December 1998). In summary, I have determined the total recharge to the groundwater aquifers will not be significantly affected by construction and the compaction of the aquifers underlying the third runway will be slight, with negligible impact on aquifer permeability and storage. Regarding the impacts related to excavation in the borrow areas, infiltration is expected to increase as soon as the till is stripped and therefore, total recharge is expected to increase (Corps, 11 August 2002). This increased recharge will minimize any adverse impacts to the aquifers.

Regarding the SR 509 interchange, I have previously determined no wetlands would be impacted by the construction of this temporary interchange, therefore, no Department of the Army permit was required and the interchange has been constructed. Indirect impacts resulting from this work were considered in my overall assessment of the project impacts.

In conclusion, I have determined the proposed mitigation adequately compensates for all of the impacts, permanent, temporary, indirect, and temporal, resulting from the proposed project. If unforeseen impacts are identified through the monitoring requirements, the mitigation areas will be adaptively managed.

***(i) Cumulative Impacts*.** Several people were concerned about the adequacy of the cumulative impact assessment completed to date, the breadth of the analysis in particular. Concerns raised included:

- Include both the projects proposed by the Port and projects in the area proposed by other agencies in the analysis. All pending MPU improvements that will either require a Section 404 permit or otherwise fall under Corps' "control and responsibility" should be considered in this application. For example, the proposed Water Systems Improvements include a proposed water tower in Gilliam Creek. There has been no mention of Gilliam Creek in any of the public notices and environmental assessments, including ESA consultation.
- Each of the proposed construction projects, as presently described and assessed, stand alone and are not evaluated for their overall (cumulative impact) on the aquatic resources of Miller Creek and Des Moines Creek.
- Simply listing the other projects and identifying their potential level of adverse impacts is not sufficient.
- A proper analysis identifies measurements of function, such as acres of wetlands, acres of uplands, and acres of contiguous habitat, for the pre-project and post-project conditions.
- The Port should have conducted an aquatic ecological risk assessment to look at the cumulative effects of chemical additions and altered water quality, in particular.
- An analysis of limited available raw data shows there will be a 5% decrease in functioning habitat in Miller/Walker drainage basin and that is fully a third of the already reduced habitat remaining. Regarding wetland acreage, 23% in Miller Creek and 7% in Des Moines Creek will be eliminated. The Port's proposed mitigation is not sufficient to offset the acres of habitat lost from development activities and offset cumulative impacts.
- Conduct an analysis for the noise and air quality impacts which will occur with the proposed project, the SASA, SR 509, and all other projects proposed in the area.

Applicant's Response. The Port has provided a cumulative effects discussion in multiple documents and the information provided briefly summarizes the significant cumulative impacts of both non-Port and Port projects with a particular emphasis on impacts to aquatic resources. Because potential impacts to wetland and stream functions are mitigated, it is the Port's belief the MPU does not contribute to cumulative wetland impacts. Other projects impacting wetlands will be required to comply with the same laws as this project and they will be required to mitigate wetland impacts, so the Port does not anticipate cumulative loss of wetland function.

District Engineer's Response. Cumulative impacts are detailed in the FEIS in the associated subsections on impacts. I have also set out these impacts in more detail in Paragraph 9(S) above. I have also looked at the landscape impacts in my independent functional assessment (see Appendix C). In summary, I looked at the past, present, and reasonably foreseeable future projects, including the additional MPU improvement projects and other agency's projects such as TRACON. I have determined while the proposed project and mitigation does not reverse the past adverse impacts having

occurred in these watersheds, it does not further contribute to the degradation of the aquatic environment, except for passerine bird and waterfowl habitat. Mitigation for these impacts are provided at the off-site mitigation in Auburn.

(11) Airport/Aircraft Safety. There were four specific areas of concern raised by several individuals regarding safety. The specific issues raised include:

- The operation of Boeing Field is limited today by airspace interactions with STIA. Any additional runway at STIA pointed directly at Boeing Field is bound to exacerbate this interaction. Gains at STIA are obtained at the cost of a similar reduction in capacity at Boeing Field.
- Incursions because of aircraft crossing active runways without permission or as a result of a controller error would be increased because of the third runway. Risk of incursions will increase by 21% or higher based on the latest set of numbers provided. Atlanta's Hatsfield International Airport had to eventually move the terminal to between the parallel runways in part to overcome a serious efficiency and safety flaw associated with aircraft taxiing. Also, the added taxiing distance will add approximately 5 minutes delay when the airport is busy which would offset much of any runway delay that might be saved.
- Aircraft safety is also compromised by the near vertical drop on the west and north sides of the proposed runway. Airplanes that undershoot, overrun, or veer off the runway could fall off the embankment and drop up to 170 feet. Aircraft landing to the south that undershoot by more than 60 feet below the glide slope would crash into the wall at the north end of the proposed runway.
- The proposed third runway will also expose additional residential and business areas north and south of the airport to probable aircraft crashes with resultant deaths and injuries to people on the ground. Although the statistical chance of an individual crash may seem small, 23% of accidents that can kill people on the ground occur within a few miles of the airport.
- New terrorist attacks, including threats from anti-aircraft missiles, emphasize the need to distribute regional assets.

Applicant's Response. The Port studied the interaction with Boeing Field and agrees some changes will need to be made for arrivals to Boeing's Runway 13 and arrivals during south flow operations of the new runway. However, during north flow operations, the Port believes the impacts of the interaction are expected to be negligible. Regarding incursions, the Port believes the third runway will enhance safety because there would be more segregated use of runways and fewer incidences of mixed operations (i.e. both landings and takeoffs) on the same runway. The new taxiways have been proposed precisely for the purpose of facilitating improved runway-crossing procedures. Furthermore, the Port stated the FAA considered the impact of the third runway on runway crossings and determined no unsafe conditions would exist.

The Port believes aircraft accident safety issues were adequately analyzed in the FEIS. The Port has acquired all residential lands within the Runway Protection Zone for the

existing and proposed runways. This area, as defined by the FAA, would be most prone to aircraft accidents.

District Engineer's Response. The FAA holds primary Federal responsibility for determining airport and aircraft safety. They have reviewed the proposed project for airport and aircraft safety concerns including incursions and safety areas. They have determined the implementation of preferred alternatives approved in their ROD are reasonably necessary for use in air commerce. They further directed the Port to develop air traffic control and airspace management procedures to effect the safe and efficient movement of air traffic to and from the proposed new runway. Approval of this plan by FAA is required. The FAA, in conjunction with the National Aeronautics and Space Administration is currently studying procedures governing staging of departing and arriving aircraft. Any changes to procedures made through this review will be implemented at STIA. I have reviewed the information presented and find no reason to disagree with FAA; therefore, no further review by the Corps is required.

As for security concerns regarding terrorist activities, STIA could be a target regardless of the construction of the third runway. As discussed in this document and Appendix B, I have determined the proposed project is in the public interest and the least environmentally damaging practicable alternative. Security concerns will be addressed by the various Federal, state, and local law enforcement agencies.

(12) Adequacy of Public Notice. A substantial number of the comments received on the project were regarding the alleged inadequacy of the multiple public notices thus affecting the public's opportunity and ability to participate in the process and provide meaningful comments. Some of the specific concerns raised include:

- A complete application must be submitted which includes "all activities which the applicant plans to undertake which are reasonably related to the same project and for which a DA permit would be required." The Corps must address the impacts from not only the portion of the project requiring a Section 404 permit but also "those portions of the entire project over which the district engineer has sufficient control and responsibility to warrant Federal Review." This would include the other MPU improvements not yet at the permitting stage as well as the EMT conveyor belt proposal.
- The public notice must "include sufficient information to give a clear understanding of the nature and magnitude of the activity to generate meaningful comments." The JARPA and public notice do not include sufficient information to "generate meaningful comments" on the associated MPU activities. The public notice contains incomplete information and inaccurate drawings. For example, the notice does not identify where the fill material will be obtained from and the drawings of the MSE wall are very difficult to understand the enormous size of the wall.
- A new public notice may be required where there are significant "changes in the application date that would affect the public's view of the proposal." The Port's continued pattern of submitting information in a piecemeal fashion, when submitted at all, makes it difficult for the public to be able to comment on the proposed project.

- The public notice should include a list of all the documents, reports, draft reports that are considered to be part of the "application". The list should also include a summary of the major elements of the document. These documents should also be available for the public to borrow. If any of the documents are revised, then a new public notice needs to be issued announcing the availability of these documents for public review.

In addition, numerous comments were received regarding the timing of the public notices and hearings. Many people requested the issuance of the third, and final, public notice be delayed so it would not conflict with the upcoming holidays otherwise the public and the scientific community would once again be left with little or no time to review and comment on last minute, rapidly changing submittals. Others also requested the public review process be extended to 60 days to allow adequate time for the public to review the complex studies just recently made available to the public. Finally, many people requested the third, and final, public hearing be held in a place where all those who wish to attend can and enough time be allowed so all who wish to be heard have the opportunity to speak.

Applicant's Response. The Port believes their application sets out all activities the Port will undertake as part of the MPU improvement projects and includes "sufficient information to give a clear understanding of the notice and magnitude of the activity to generate meaningful comment." In addition, they believe they have disclosed the existence of Port-sponsored non-MPU projects and non-Port projects in the vicinity of STIA. As for the conveyor belt, it is the Port's position that it is not a necessary component to be able to construct the MPU improvement projects.

District Engineer's Response. I do not agree the public notice comment process was inadequate. Ensuring the public has ample opportunity to comment either via a public notice or public hearing is an important component of the Corps' application review process. Because of the size and controversial nature of the proposed project, the Corps paid careful attention to ensuring public participation throughout the process. To that end, the Seattle District published three different public notices and held three separate hearings (see Paragraph 8 above for details). In deciding when to issue a revised notice, I followed the guidance in 33 CFR 325.2(a)(2) which states "[t]he district engineer will issue a supplemental, revised, or corrected public notice if in his view there is a change in the application data that would affect the public's review of the proposal." In determining what to include in a revised public notice, I followed the guidance in 33 CFR 325.3. Based on this guidance I issued the third, and final, public notice on 27 December 2000.[48] In this notice I discussed the changes in the project since the second notice, more detailed information on other proposed projects in the vicinity, a list of reports available for review at the Seattle District Corps office and three

[48] An erratum was issued on 17 January 2001 to include the notification of a request to the State of Washington, Department of Ecology, for Water Quality Certification, and Certification of Consistency with the Coastal Zone Management program.

other locations in the project neighborhood, and a notice for a two-day public hearing. The reports available included, but were not limited to, the NRMP, *Stormwater Management Plan*, *Functional Assessment*, and *Low Streamflow Analysis*. While the "nature and magnitude" of the project had not substantially changed from the final notice, more details have been provided in response to the issues raised during the various public comment opportunities. Final revisions to reports such as the *NRMP*, *Stormwater Plan*, *Functional Assessment*, and *Low Streamflow Analysis*, are not routinely made the subject of revised public notices because they would not affect the public's review of the proposal. The comments provided on the draft reports were used to finalize the documents. Though additional comments on subsequent versions of these reports have been provided and these concerns have also been considered in my review and ultimate acceptance of these reports, the changes are not believed to affect the public's review of the proposal. Regarding the conveyor belt, I have determined this is a separate project from the Third Runway. While the conveyor belt does rely on the Third Runway for its purpose, the Third Runway does not rely on the conveyor belt for its completion. Therefore, a separate permit application is being processed.[49]

Regarding the timing of the final public notice, I am obligated to issue a public notice within 15 days of receipt of a complete application. Therefore, I did not wait until after the holidays. However, over 50 days were given to the public to submit comments on the public notice.[50] I also have accepted and considered all comments provided even outside of the formal comment periods to ensure the pubic had all opportunities for participation. The final public hearing was held at a large auditorium with sufficient space for all those wishing to attend. Also, as the hearing was held over a two-day period, all those present wishing to speak were accommodated.

Based on the information provided in the third public notice, the nature of the changes in the project since that time, the public's opportunities to comment, and the guidance in the regulations, I have determined a fourth public notice is not warranted. The changes since the third public notice in my view would not affect the public's review of the project.

(13) Compliance with Other Applicable Laws. Several people raised concerns regarding the proposed project and the Port's compliance with other Federal, state, and local laws. In particular, several individuals believed Ecology and Governor Locke are not able to certify the compliance of the project with the CAA and CWA. Also, a state guarantee of compliance is different in spirit and intent than a monitoring commitment. Therefore, they believe the Corps needs to perform a separate air conformity analysis.

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[49] A permit application was received on 9 November 2000 from The Wescot Company/Environmental Materials Transport (EMT), LLC and given the reference number of 2000-1-01481. The USFWS concurred with a determination of not likely to adversely affect for bull trout, marbled murrelet, and bald eagle on 20 May 2002. The NMFS is still reviewing the project for ESA/EFH compliance. A public notice has not yet been published.

[50] 33 CFR 325.2(d)(2) provides guidance regarding the length of a public notice comment period.

Many individuals believed there has been insufficient evaluation of the proposed project for compliance with the Endangered Species Act (ESA). They questioned how the Port could continue working without first completing the necessary consultations. The consultation should include candidate species like coho salmon that are present in Miller Creek.

A couple of individuals questioned whether a Memorandum of Agreement between the Port of Seattle and the Highline School District has been initiated as discussed in the Cultural Resources section of the public notice.

One group believes the Corps cannot issue a Section 404 permit until pending litigation is completed on the Section 401 permit.
A few people also stated the proposed project has to also comply with wetlands protection measures adopted by the State and the various local municipalities.

One person also questioned how the Section 402 permit can be requested without first receiving the Section 401 and 404 permits.

Several people also raised concerns about performing work in areas where there is a MTCA cleanup order in place.

Applicant's Response. The Port believes they are in compliance with all the applicable laws and regulations including the Governor's Clean Air and Water Certificate, the Section 401 permit, the existing NPDES permit, and the MTCA cleanup order. They also state the required coordination under the ESA has been completed.

Specifically regarding the WQC, the Port stated "the Corps' own regulations make clear that the mere existence of ACC's challenge to the Department of Ecology's §401 Certification does not justify any delay in the Corps' consideration of the Port's §404 permit application."

Various consultants for the Port also spoke at the hearings and provided written comments regarding the adequacy of the ESA documentation and believed the Port had provided "much more detailed information as generally found in most similar documents."

District Engineer's Response. I generally agree with the Port's response. Issuance of a permit under Section 404 of the Clean Water Act by the Corps does not obviate the need of the Port to obtain other Federal, State, or local authorization required by law including those described in Paragraph 7 above.[51] As required for issuance of a Section 404 permit by the Corps, Ecology must issue, or waive, a WQC and CZM Consistency Certification, both of which rely in part on compliance with other local laws. I must also determine the proposed project is in compliance with other Federal laws,

[51] This is a limitation of the Port's authorization as stated in their permit.

statutes, regulations, and policies including ESA, EFH, NEPA, NHPA, CAA, CWA, and Executive Orders. The FAA also has requirements for making a final decision including the issuance of a "certification" by Ecology and Governor Locke to the FAA providing reasonable assurance that the Port's proposed project will comply with applicable air and water quality standards (49 USC 47106(c)(B)). The WQC and CZM Certification were reissued on 21 September 2001. The NPDES Stormwater Permit was issued on 20 February 1998 and modified on 29 May 2001. The NPDES General Stormwater Permit for Construction Activities was issued on 4 April 2001. The required coordination for compliance with the ESA, EFH, CAA, and NHPA has been completed and the proposed project has been determined to comply with the requirements of these laws. Completion of this document ensures compliance with NEPA and the Executive Orders. The FAA also completed their necessary NEPA analysis and other determinations as documented both in their original and revised RODs.

Regarding holding in abeyance any Section 404 decision for completion of the PCHB appeals, as discussed in Paragraph 7(J) above, the Corps has a valid WQC as required for making a decision on a Section 404 permit. RGL 87-03 states "if a state issues a 401 water quality certification, and a state or Federal court voids or sets aside that certification before the Corps issues the permit **and** within the statutory 1-year period from the date of application, then the Corps cannot issue the permit unless and until the 401 certification is legally revived" (emphasis added). The one-year period expired on 17 January 2002 and no court voided the certification prior to that date. Therefore, the 21 September 2001 WQC is valid. However, in their 12 August 2002 decision, the PCHB added 16 conditions to the 21 September 2001 WQC. The Port has chosen to appeal 8 of the 16 conditions. Ecology is appealing 3 of the 16 conditions and appealing on one procedural issue. The ACC is not appealing any of the conditions but are appealing the rationale and application of some of the conditions as well as some procedural issues. All of the appeals are pending. As discussed in Paragraphs 7(J) and 9(A) and (C) above, the Corps has reviewed the PCHB decision and has incorporated those conditions it believes are necessary to meet the Corps' regulatory requirements. If the PCHB decision is modified, in accordance with 33 CFR 325.7, I have the choice of modifying, suspending, or revoking the permit to include any changes.

B. Native American Tribes

(1) Muckleshoot Indian Tribe. The Muckleshoot Indian Tribe believed the Corp's review of the proposed mitigation should include an analysis of the extent to which the Auburn mitigation site may impede restoration options in the tributaries to the Green River. If the mitigation site would result in decreased flows or cause an extended dry period in the tributary, then the use of the streams by over-wintering juvenile chinook fry and newly emergent coho fry would be reduced or eliminated. Consideration should be given to providing passage from the Green River through the levee into the mitigation site.

Applicant's Response. The Port has met with the Muckleshoot Tribe Fisheries Department to ensure the wetland mitigation planned in Auburn will complement the Tribe's efforts toward creek restoration. It is the Port's belief the mitigation would not alter the seasonal distribution of flow in the tributary. There are no passage barriers to fish movement between the existing drainage ditches and the planned mitigation, therefore passage conditions will remain variable and dependent on periods of heavy rain or flood stages on the Green River.

District Engineer's Response. I reviewed the proposed mitigation to make sure these concerns were addressed. The proposed mitigation as designed will not impede other restoration options in the tributaries to the Green River nor will it result in decreased flows. As the function targeted for replacing at this mitigation site was for avian habitat and not off-channel fish habitat, breeching the Green River dike was not chosen as an option.

Treaty Rights: In the mid-1880's, the United States entered into treaties with a number of Indian tribes in Washington. These treaties guaranteed the signatory tribes the right to "take fish at usual and accustomed grounds and stations . . . in common with all citizens of the territory" [U.S. v. Washington, 384 F.Supp. 312 at 332 (WDWA 1974)]. In U.S. v. Washington, 384 F.Supp. 312 at 343 - 344, the court also found that the Treaty tribes had the right to take up to 50 percent of the harvestable anadromous fish runs passing through those grounds, as needed to provide them with a moderate standard of living (Fair Share). Over the years, the courts have held that this right comprehends certain subsidiary rights, such as access to their "usual and accustomed" fishing grounds. More than de minimis impacts to access to usual and accustomed fishing area violates this treaty right [Northwest Sea Farms v. Wynn, F.Supp. 931 F.Supp. 1515 at 1522 (WDWA 1996)]. In U.S. v. Washington, 759 F.2d 1353 (9th Cir 1985) the court indicated that the obligation to prevent degradation of the fish habitat would be determined by a case by case basis. The Ninth Circuit has held that this right also encompasses the right to take shellfish [U.S. v. Washington 135 F.3d 618 (9th Cir 1998)].

The work proposed in this application has been analyzed with respect to its effects on the treaty rights described above, and my conclusions are that (1) the work will not interfere with access to usual and accustomed fishing grounds or with fishing activities or shellfish harvesting; (2) the work will not cause the degradation of fish runs and habitat; and (3) the work will not impair the tribes' ability to meet moderate living needs.

C. Federal Agencies

(1) U.S. Environmental Protection Agency (EPA). The EPA submitted several sets of comments, 3 February 1998, 26 November 1999 and 8 June 2001. Overall, EPA initially concluded the project does not comply with the Section 404(b)(1) Guidelines and recommended denial unless the issues and concerns outlined in numbers 1 through 12 were addressed. In their final comments, EPA requested we

consider the issues and concerns outlined in numbers 3, 5, 9, and 12 through 17 in our final decision. EPA's concerns included:

1) Increase the amount of in-basin mitigation provided in Walker Creek.
2) FAA needs to provide written approval of the mitigation plan.
3) The Port discloses its intentions for the use of the additional acquired land available after all of the MPU projects have been developed. EPA is concerned the Port may already have plans for additional commercial/industrial enterprises on this acreage, which have not yet been described. This would constitute piecemealing of the project.
4) The Corps needs to conduct an independent alternatives analysis. The project purpose seems to be speculative in nature.
5) The low flow analysis must be completed prior to any final decision.
6) Temporary impacts should be monitored for 10 and not 5 years as proposed.
7) Contingency plans need to be developed for the off-site mitigation for the potential impacts to hydrology if the surrounding area is developed.
8) A substantial bond should be posted to ensure the mitigation performs as designed.
9) A condition should be added requiring coordination with the Corps and Ecology if any alterations to the wetland vegetation or hydrology are required under the *Wildlife Hazard Management Plan* are implemented.
10) The public notice and "mitigation plan" fails to identify appropriate compensatory mitigation for the wetland impacts. Additional in-basin mitigation needs to be identified.
11) There are opportunities for further avoidance by downsizing or changing the footprint of the SASA.
12) There are off-site borrow areas available avoiding the on-site impacts. The potential indirect impacts to the wetlands and Des Moines Creek in the borrow areas needs to be assessed.
13) Because some of the fill material being used contains low residuals of some toxic compounds, sampling of the seepage water coming from the fill material should be required to determine if the water contains harmful materials.
14) A functional replacement analysis needs to be performed to assess the adequacy of the proposed mitigation.
15) A cumulative impact assessment needs to be completed.
16) The performance standards need to be rewritten so they are enforceable.
17) An appropriate notice should be placed on the title or deeds to ensure the mitigation areas are preserved in the future.

Applicant's Response. The Port provided the following responses for the first two comment letters. The Port chose not to provide comments on the final letter. The Port's responses are:

1) The project will not fill the headwaters of Walker Creek.
2) The Port is seeking FAA approval of the mitigation plan.

3) The Port has confirmed it does not have plans for the use of the additional land, and no permit applications have been filed with the Corps.
4) The Port believes the Corps has conducted an independent alternatives analysis.
5) The Port believes the Corps is satisfied the potential impacts of the fill have been assessed sufficiently to allow the Corps to make an informed permit decision.
6) Because the temporary impacts may vary, it will not be necessary to monitor temporary impacts for ten years to demonstrate successful restoration.
7) Nearby development could alter hydrologic conditions in the wetland. However, the near-surface hydrology of the wetland mitigation site appears to be largely precipitation driven, and not dependent on regional groundwater conditions. The amount of precipitation falling on the wetland will not be altered by off-site development, and thus the hydrology in the wetland mitigation project should function as designed.
8) The Port is a public agency and does not need to post a bond.
9) The mitigation plans have been designed to be consistent with the FAA approved *Wildlife Hazard Management Plan*. Any activities on the mitigation site for the purposes of wildlife hazard management will be consistent with permit conditions.
10) The Port has revised the proposed mitigation plan. The final version is dated November 2001.
11) The design of SASA was modified to reduce impact to Des Moines Creek and higher quality wetlands. SASA must be located adjacent to runways in an area allowing access by commercial passenger and cargo jet aircraft. Further minimization efforts would significantly reduce the space available for SASA, creating significant design impediments, and substantially affect the viability of the project.
12) The proposed borrow areas will provide 6.1 million cubic yards of material or 35% of the total fill requirements. Use of on-site borrow will result in a substantial cost savings of up to $45 million dollars of public funds.

District Engineer's Response. All of EPA's concerns were addressed as follows.

1) I also had questions about making sure there was adequate mitigation in Walker Creek. Because of the size and location of the impacts, I concentrated on ensuring there will be adequate hydrology post-construction for Wetland 43 and Walker Creek. Habitat mitigation was concentrated in Miller Creek. I have thoroughly reviewed the latest mitigation proposal and have determined it adequately compensates for the impacts (see Appendix C).
2) Both FAA and the Corps have approved the final mitigation plan.
3) I disagree with EPA that the project has been, or will be, piecemealed (see Paragraph 10(A)(4) above). The Port has disclosed all of the projects that can be considered part of a single and complete project. In particular, the acquired land to the west of the proposed runway will be used for mitigation and the construction of TRACON and the Airport Surface Detection Equipment.
4) I agree with EPA and did perform an independent alternatives analysis (see Appendix B).

5) I agree with EPA and as described in paragraph 10(A)(6)(b) above, I have reviewed the final low flow analysis and have determined the mitigation proposed by the Port should maintain the streamflow in the creeks and have added a special condition described in Paragraph 9(C) to ensure the mitigation measures are implemented as designed. Hydrology monitoring of the wetlands for potential indirect impacts is also a special condition of the permit.
6) I agree with EPA and monitoring for all the mitigation, including the areas to be restored after construction, is for a 15-year period.
7) I agree that the potential impacts to hydrology from surrounding development at the Auburn mitigation site needs to be monitored. I have determined the monitoring and contingency plans adequately address EPA's concerns. Potential indirect impacts from future surrounding development will also be examined if projects are proposed as most of the area contains wetlands requiring a permit from the Corps.
8) I agree with the Port's response. As a general policy, the Corps does not require public agencies to post bonds because they are highly unlikely to go out of business and have the ability to levy taxes to obtain the necessary funds.
9) I partially agree with EPA. The Corps will be contacted before any work is started within the mitigation areas as required by the restricted covenants and the *Wildlife Hazard Management Plan*. Therefore, no additional special conditions were necessary.
10) I agree with EPA that the version of the mitigation plan they reviewed was inadequate. Additional mitigation was provided from what EPA reviewed and commented on. I have determined the final NRMP adequately compensates for the impacts (see Appendix C).
11) I do not agree with EPA. No further minimization of the SASA footprint is practicable (see Appendix B for discussion).
12) I do not agree with EPA. I have performed an independent review regarding the need for the on-site borrow areas and the potential indirect impacts. The proposal was revised to avoid direct impacts to the wetlands in Borrow Area 3 and a portion of the wetlands in Borrow Area 1. I have determined the mitigation proposed by the Port should maintain the streamflow in the creeks and have added a special condition described in Paragraph 9(C) to ensure the mitigation measures are implemented as designed.
13) Ecology is the agency with primary responsibility for compliance with Sections 401 and 402 of the Clean Water Act and they have developed fill material criteria and have certified compliance by issuing a WQC. The PCHB revised the fill criteria. As discussed in Paragraph 9(C) above, I have reviewed the PCHB fill criteria and have determined the criteria listed in the WQC are protective of the aquatic environment. Sampling of the seepage from the embankment is a requirement of both the WQC and the Biological Opinion issued by USFWS. No additional conditions were added to the permit.
14) I agree with EPA and I completed my own independent functional assessment (see Appendix C).
15) The FEIS does contain cumulative impact assessments and I have provided further review at Paragraph 9(S) above.

16) The performance standards have been rewritten several times since EPA's comments were made. The standards as described in various tables in the NRMP have been reviewed, approved, and are enforceable.
17) Restricted covenants have been developed for all the various mitigation areas (see Appendix G of the NRMP). A special condition has been added to the permit requiring recording of these covenants (see Paragraph 12(M) below).

(2) U.S. Fish and Wildlife Service (USFWS). The USFWS had the following concerns regarding the proposed project.

1) The practicability of the barge and conveyor alternative needs to be fully addressed.
2) Demonstrate that mitigation for wildlife impacts within 10,000 feet of the airport is contrary to the FAA guidance.
3) Specific projects need to be identified for the Port to receive credit for the trust fund mitigation proposal.
4) Mitigation should be monitored for 10 and not 5 years.
5) Performance standards need to be provided for the enhancement sites.
6) Mitigation located outside the watershed would not benefit wildlife directly impacted by the project.
7) Impacts from the project could be further minimized by locating the borrow areas off-site.
8) Additional mitigation needs to be provided to offset the temporal impacts.

Several detailed comments regarding the proposed mitigation plan (1998 version) were also provided.

Applicant's Response. The Port provided the following responses.

1) The construction of the conveyor would require certain discretionary approvals from the City of Des Moines including easements to cross City-owned land, right-of-way crossing approvals, a permit or zoning ordinance amendment, a shoreline substantial development permit, and review and approval pursuant to SEPA. Des Moines has initiated and is actively pursuing litigation against the Port and FAA in an effort to block construction of the third runway. Therefore, the Port has concluded in the FEIS and FSEIS there are permitting obstacles rendering the Des Moines Creek conveyor project infeasible at this time. The Department of the Army permit does not need to include the conveyor belt proposal because all of the MPU projects could be built even if the conveyor is never completed.
2) The FAA Advisory Circular provides that land uses that are wildlife attractants be sited no closer than 10,000 feet from turbine aircraft movement areas and 5 miles from approach or departure airspace. As part of the FAA Part 139 Airport Certification Program, the Port is required to maintain and implement a wildlife hazard management plan designed to minimize strikes. The FAA and the Port believe wildlife habitat mitigation is a land use that should not occur near STIA. In the FAA ROD, the Port is required to comply with the guidelines of the Circular as a condition of eligibility for Federal funding for the MPU Development Improvements.

The Circular does not automatically require the Port to locate the mitigation wetlands away from the Airport. However, it is one of a series of policy considerations supporting the FAA decision to require the Port to construct offsite wetland mitigation as part of the MPU improvements.

3) The Des Moines Creek Basin Plan, the Stream Survey Report for Miller Creek, or other key criteria used to evaluate the proposals will define projects eligible for trust fund monies. Implementation of these projects will not be included as formal mitigation for the Department of the Army permit approvals if reviewing agencies conclude the potential trust fund projects are not adequately defined.
4) As required by Ecology and the Corps, the Port will implement a detailed monitoring plan for a period of 15 years.
5) The Port has revised the performance standards as directed by Ecology and the Corps.
6) The Port's proposal to construct a mitigation wetland in Auburn is driven by the unique requirement to protect aircraft passenger safety while mitigating wetland impacts. The proposed off-site mitigation allows an overall gain in habitat value and diversity by creating a single, large mitigation site. Furthermore, the proposed mitigation is in compliance with FAA's Circular as discussed above.
7) The proposed borrow areas will provide 6.1 million cubic yards of material or 35% of the total fill requirements. Use of on-site borrow will result in a substantial cost savings of up to $45 million dollars of public funds.
8) The proposed mitigation accounts for time delay in re-establishing wetland functions by providing mitigation ratios in excess of 1 to 1.

The Port has modified the proposed mitigation plan initially reviewed by the USFWS and has considered the USFWS's concerns in these revisions.

District Engineer's Response. All of USFWS's concerns were addressed as follows.

1) I agree with the Port's response. The conveyor belt is a separate project from the proposed third runway. Alternatives for transporting fill materials were examined. See Appendix B for my independent alternatives analysis.
2) I also had questions regarding a strict interpretation of the FAA circular. Recent Corps guidance has stated, "[c]ompensatory mitigation projects that have the potential to attract waterfowl and other bird species that might pose a threat to aircraft should not be sited with the limits specified by the Federal Aviation Administration Advisory Circular…" (See RGL 01-01). Care was taken in planning the proposed mitigation to provide on-site mitigation targeting functions other than avian habitat, which will be mitigated for at Auburn. See Appendix C for detailed discussion regarding the proposed mitigation.
3) I agree with the USFWS and potential lists of projects are listed in the NRMP, as are criteria for eligibility. If the money is not used in 5 years from the date of permit issuance, the Port will use the money to implement projects meeting the criteria. Therefore, I have accepted the Trust Funds proposal as part of the Port's mitigation plan.

4) I agree with USFWS that 5 years of monitoring is not sufficient and therefore, the NRMP has been revised so the mitigation will be monitored for 15 years.
5) Performance standards have been proposed, revised, reviewed, and approved.
6) I agree with the Port's response. Compliance with the FAA Circular is necessary (see comment 2 above).
7) I do not agree with USFWS. The Port has demonstrated a need to use the on-site borrow areas (see Appendix B).
8) I agree with USFWS and additional mitigation has been proposed since USFWS's comments were made. I have determined the permanent, temporary, and temporal impacts have been adequately mitigated (see Appendix C).

As for the comments on the 1998 version of the mitigation plan, the NRMP has been revised and the USFWS comments are no longer applicable or have been incorporated in the final version.

(3) National Marine Fisheries Service (NMFS). NMFS commented only on the first public notice and stated that if any anadromous fish species become listed pursuant to the ESA and are present in the project area, consultation with NMFS may be required.

Applicant's Response. Comment noted.

District Engineer's Response. Chinook salmon and critical habitat were listed after the first public notice. The FAA prepared a Biological Evaluation and completed the necessary consultation with NMFS (see Paragraphs 7(E) and (F) above). The FAA also completed the necessary EFH coordination. No further coordination is required.

(4) Federal Aviation Administration (FAA). The FAA has reviewed all options to avoid or reduce wetland fill and has determined there is no other viable alternative meeting the project purpose and need. The FAA believes the proposed mitigation developed by the Port achieves the desired mitigation of hydrologic functions of wetlands and stream in the immediate airport vicinity. The FAA requires the wetland mitigation habitat be at a distance of 10,000 feet of more from the airport due to safety concerns. The Port's approach complies with the letter and intent of the FAA's circular on "Hazardous Wildlife Attractants On or Near Airports."

Applicant's Response. Comment noted.

District Engineer's Response. I concur with FAA's assessment that the Port's proposed project is the least environmentally damaging practicable alternative (see Appendix B). I however, have determined the mitigation approved by FAA was not adequate to compensate for the proposed impacts. Therefore, the Port voluntarily revised their proposed mitigation in a final report dated November 2001 and revised in January 2002. I have determined this mitigation compensates for the proposed impacts (see Appendix C).

(5) U.S. Department of Agriculture. The Wildlife Services program in the U.S. Department of Agriculture has a Memorandum of Understanding with FAA stating the Wildlife Services will provide technical and operational assistance to alleviate wildlife hazards at airports. As the primary agency responsible for addressing issues related to wildlife damage, including hazards at airports, it is our position that wetland mitigation measures at STIA should be conducted off-site. On-site mitigation would attract hazardous wildlife, particularly waterfowl, compromising air safety thus increasing the probability of a damaging or fatal strike. If a new wetland were established on-site with vegetation and cover unattractive to wildlife, both the spirit and intent of the mitigation effort would be violated.

Applicant's Response. Comment noted.

District Engineer's Response. I concur that care needs to be taken to minimize the potential for safety problems with bird strikes. However, I do not concur that all mitigation therefore needs to be developed off-site. Care was taken in planning the proposed mitigation to provide on-site mitigation targeting functions other than avian habitat, which will be mitigated for at Auburn. See Appendix C for detailed discussion regarding the proposed mitigation.

(6) Corps of Engineers, Real Estate Division. In a memorandum dated 20 March 2001, the Corps of Engineers, Real Estate Division, stated the project does not involve Corps property requiring a real estate instrument.

D. State Agencies

(1) Washington State Department of Transportation (WSDOT). WSDOT adopted Resolution 567 to expand the state's role in aviation because of the increasing importance of air transportation to Washington's economy and the well being of Washington's citizens. The policy calls for WSDOT, in coordination with FAA standards, to take the lead in initiating talks with environmental protection agencies and other stakeholders to develop an off-site mitigation approach for Washington airports for the preservation of aviation safety.

Applicant's Response. Comment noted.

District Engineer's Response. Comment noted. Care was taken in planning the proposed mitigation to provide on-site mitigation targeting functions other than avian habitat, which will be mitigated for off-site at Auburn. The PCHB did require the Port to mitigate for on-site wetlands losses at a ratio of 2:1 and explore additional on-site mitigation opportunities, in Walker Creek especially. I have determined the NRMP adequately mitigates for the proposed impacts and did not require additional mitigation. See Appendix C for detailed discussion regarding the proposed mitigation.

11. Section 404(b)(1) Evaluation. The proposed work was evaluated pursuant to Section 404(b)(1) of the Clean Water Act in accordance with the Guidelines

promulgated by the Environmental Protection Agency (40 CFR 230) for evaluation of the discharge of dredged or fill material into waters of the United States. In addition, consideration has been given to the need for the work and to such water quality standards as are appropriate and applicable by law. This evaluation is presented in Appendix B of this ROD.

My evaluation concludes the proposed discharge is in compliance with the Section 404(b)(1) Guidelines because the Port has shown the proposal represents the least environmentally damaging practicable alternative meeting the project purpose and includes all appropriate and practicable measures to minimize adverse effects on the aquatic environment. The work will not result in the unacceptable degradation of the aquatic environment.

12. Determinations. I have reviewed and evaluated, in light of the overall public interest, the documents and factors concerning this Department of the Army permit application, as well as the stated views of other interested Federal and non-Federal agencies, Native American Tribes, and the concerned public, relative to the proposed work in waters of the United States.

I have made the following determinations:

A. NEPA. The proposed project complies with the requirements of NEPA. The project was evaluated through both a FEIS and FSEIS with FAA as the lead agency and the Corps as a cooperating agency. The FAA prepared two RODs for this project dated July 1997 and 8 August 2001. As discussed in Paragraph 10(A)(8) above, I have determined the changes to the project are not substantial nor are there significant new circumstances or information relevant to environmental concerns since the FSEIS was published and publication of another supplemental EIS is not warranted. Therefore, as a cooperating agency, I am adopting all of the EIS documents, including the FEIS and FSEIS.

B. Section 404(b)(1) Evaluation. The discharges and methods specified in the proposed work, with the inclusion of special conditions, are in accordance with the Section 404(b)(1) Guidelines (see Appendix B to this ROD).

C. Clean Air Act. The FAA has analyzed the proposed project for conformity applicability pursuant to regulations implementing Section 176(c) of the Clean Air Act. They have determined the activities proposed under this permit will not exceed *de minimis* levels of direct emissions of a criteria pollutant or its precursors and are exempted by 40 CFR Part 93.153. Any later indirect emissions are generally not within the Corps continuing program responsibility and generally cannot be practicably controlled by the Corps. Based on the Corps' review of the information provided regarding air conformity and the *de minimis* determination, we concur with the FAA's analysis. As stated in Paragraph 7(C) above, the EPA, PSAPCA, Ecology, and the State of Washington also all agree with the *de minimis* determination.

D. National Historic Preservation Act. I have determined the proposed project is in compliance with the NHPA. Special conditions were added to the permit to ensure compliance with the monitoring plan. See Paragraph 9(D) above for further discussion.

E. ESA. A letter of concurrence was received from NMFS on 31 May 2001 and a BO was received from USFWS on 22 May 2001. The Synthetic Precipitation Leaching Procedures (SPLP) Work Plan as required in BO was received on 18 July 2001. I have determined that FAA has completed the necessary coordination under Section 7 of the ESA. To ensure the conservation measures discussed in the BA and the measures in the BO are implemented, I have added a special condition to the permit (see Paragraph 12(M) below).

F. EFH. I have determined the necessary coordination for EFH has been completed. The ESA special condition will ensure the conservation measures discussed in the BA are implemented.

G. Executive Order 11988 – Floodplain Management. The proposed fill will impact a portion of the 100-year floodplain of Miller Creek. A portion of the mitigation site is also located within the 100-year floodplain. Mitigation is proposed to offset these impacts. I find the potential adverse impacts to floodplains, both short and long term, have been avoided where practicable and adverse impacts have been minimized and mitigated with the creation of additional floodplain and the design of the stormwater management system (see Paragraph 7(G) above). I also find no additional mitigation is warranted. The FAA made a similar determination in their ROD dated 3 July 1997.

H. Executive Order 12898 – Federal Actions to Address Environmental Justice in Minority and Low-Income Populations. The proposed project is located in a geographical area with slightly more Black/African Americans or Hispanic/Latino populations than other areas of King County. The cities of Burien and Tukwila also have slightly higher populations of individuals over 65, families with children less than 18, and single mothers with children less than 18 living below the poverty level. I have determined no extraordinary measures were warranted regarding public participation based on the homogeneous nature of the areas demographics. No special translations or distribution methods were deemed necessary. No undue risks or pressures were identified for any one minority or low-income population. Therefore, I have complied with the intent of the EO on Environmental Justice (see Paragraph 7(H) above). The FAA made a similar conclusion in their ROD dated 3 July 1997.

I. Public Interest. Based on the analysis found in Section 9 above, the work will have no significant adverse effect on these public interest factors. The proposed work is considered to be not contrary to the general public interest.

J. Federal Agency Recommendations. The EPA initially recommended denial of a permit for the proposed work. The USFWS did not object to issuance of the permit if the Port complies with the 404(b)(1) Guidelines on alternatives and their concerns are addressed. The EPA did not recommend denial in their comments on the third public

notice, but requested certain issues be addressed. The USFWS did not comment on the third public notice. The issues of both agencies have been addressed (see Sections 10(C)(1) and 10(C)(2) of this ROD). The NMFS comments were provided through the ESA coordination process. Therefore, I have determined the comments of these Federal agencies have been addressed and no further coordination is required.

K. Native American Tribes. The Muckleshoot Indian Tribe requested the Corps review include an analysis of how the proposed Auburn mitigation may affect future restoration efforts on the Green River (see Section 10(B)(1) of this ROD). I have completed the necessary analysis and have determined the mitigation as designed will not adversely impact future restoration efforts.

L. Public Hearing. In response to extensive public interest in the proposed project, public hearings were held on 9 April 1998, 3 November 1999, and 26/27 January 2001 in accordance with 33 CFR Part 327.

M. Special Conditions. The following special conditions will be added to the permit.

a. The stormwater BMPs for better removal of dissolved metals, shall be selected from the Enhanced Treatment Menu found in August 2001 edition of the *Stormwater Management Manual for Western Washington*.

b. The Port shall sample stormwater above and below stormwater outfalls and monitor the hardness of the receiving waters (Miller, Walker, and Des Moines creeks).

c. The Port will perform the water quality toxicity testing on specific sensitive organisms. These organisms and testing protocols will be approved by Ecology prior to testing. Testing shall measure injury, as well as mortality of those organisms.

d. 100% of the stormwater management facility retrofit shall be completed by the time 50% of the paved impervious surfaces have been constructed. Status reports will be provided to U.S. Army Corps of Engineers, Seattle District, Regulatory Branch, every 6 months from the date of permit issuance documenting the amount of paved impervious surface constructed and the amount of retrofitting completed until the 100%/50% goal is reached.

e. The *Natural Resource Mitigation Plan, Master Plan Update Improvements, Seattle-Tacoma International Airport* (NRMP) dated November 2001 with the corrections dated January 2002, February 2002, and November 2002, will be implemented. The dates for the submittals of as-built drawings and monitoring reports are as described in the table titled "Reporting schedule for mitigation projects during the 15-year monitoring period". Year 0 is the year the as-built drawings are approved by the Corps in writing.

f. Water will be released from the low-flow vaults as described in the *Low Streamflow Analysis* dated December 2001 and at the rates as specified in Table 4-2 of the *Low Streamflow Analysis*, or as subsequently modified and approved by the U.S. Army Corps of Engineers, Seattle District, Regulatory Branch. Documentation of this release will be included in the monitoring reports described in the NRMP.

g. The minimum number of test samples of the proposed fill shall be increased to reflect the number of samples required under MTCA.

h. The monitoring in Condition F(1) of the Section 401 Water Quality Certification is modified so that monitoring continues for as long as there are contaminants in the Airport Operations and Maintenance Area (AOMA).

i. A water right to use the water stored in the low-flow vaults for mitigation of low flow impacts in Walker Creek must be obtained before commencing paving of the third runway and the associated new taxiways west of the coordinates listed below. A water right to use the water stored in the low-flow vaults for mitigation of low flow impacts in Des Moines Creek must be obtained before commencing construction of the SASA building and associated paving. A copy of the water right(s) will be provided to the U.S. Army Corps of Engineers, Seattle District, Regulatory Branch prior to commencing paving and/or construction of the SASA building.

Taxiway	Coordinate
A	E12230
E	E12230
J	E12230
N	E11990
P	E12000
Q	E12230

Reporting schedule for mitigation projects during the 15-year monitoring period.

	Monitoring Year															
Mitigation Project	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Des Moines Way Nursery Site	□	■	■	■	◆	■	◆	■	◆	◆	■		■			■
Vacca Farm	□	■	■	■	■	■	◆	■	◆	◆	■		■			■
Miller Creek Relocation	□	■	■	■		■		■			■		■			■
Miller Creek Buffer	□	■	■	■		■		■			■		■			■
Stream Enhancement	□	■	■	■		■		■			■		■			■
Replacement Drainage Channels	□	■	■	■	■	■		■		■			■			■
Tyee Valley Golf Course	□	■	■	■		■		■		■	■		■			■
Restoration of Temporary Impacts	□	■	■	■	◆	■	◆	■	◆	◆	■		■			■
Monitoring for Indirect impacts	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
Auburn Wetland Mitigation	□	■	■	■	◆	■	◆	■	◆		■		■			■
Contingency Actions	▣	▣	▣	▣	▣	▣	▣	▣	▣	▣	▣	▣	▣	▣	▣	▣

□ - As-built (record) survey and report. Submitted within 60-days of construction and planting.
■ - Detailed monitoring reports. Submitted by December 31st of each monitoring year. Monitoring reports for each project will be combined into a single document.
◆ - Hydrologic monitoring only.
⊙ - Monitoring and reporting follows requirements of the 401 Water Quality Certification.
▣ - Additional monitoring requirements or limited interim reporting may be required of any project if contingency actions are taken.

j. A professional archaeologist must be on-site to monitor for the presence of archaeological resources during all ground disturbing construction within the channel excavation area at Vacca Farm and western portion of the Tyee Valley Golf Course areas. The archaeological monitoring plan prepared by Larson Anthropological Archaeological Services Limited, dated 7 June 2001, must be implemented in its entirety.

k. A summary report of the findings of the archaeological monitoring or status report must be submitted to the U.S. Army Corps of Engineers, Seattle District, Regulatory Branch within 13 months of permit issuance and yearly thereafter until construction in these areas have been completed.

l. If human remains or archaeological resources are encountered during construction, all ground disturbing activities shall cease in the immediate area and the permittee shall immediately (within one business day of discovery) notify the U.S. Army Corps of Engineers, Seattle District, Regulatory Branch (Corps), Federal Aviation Administration (FAA) and the State Historic Preservation Officer (SHPO). The permittee shall perform any work required by the Corps in accordance with Section 106 of the National Historic Preservation Act and Corps regulations.

m. You must implement and abide by the ESA requirements and/or agreements set forth in the *Biological Assessment, Master Plan Update Improvements, Seattle-Tacoma International Airport*, dated June 2000, in its entirety. The U.S. Fish and Wildlife Service (USFWS) concurred with a finding of "may affect, not likely to adversely affect" based on this document in a Biological Opinion (BO) dated 22 May 2001 (USFWS Reference Number 1-3-96-I-29, 1-3-99-SP-0744). The BO contains mandatory measures that are incorporated by reference in this permit. The National Marine Fisheries Service (NMFS) concurred with a finding of "may affect, not likely to adversely affect" based on this document on 31 May 2001 (NMFS Reference Number WSB-00-318). Both agencies will be informed of this permit issuance. Failure to comply with the commitments made in this document and as described in the USFWS BO constitutes non-compliance with the ESA and your Department of the Army permit. The USFWS and/or NMFS are the appropriate authority to determine compliance with ESA.

n. Both the onsite and offsite wetland mitigation areas created, enhanced, and/or restored as mitigation for work authorized by this permit, shall not be made the subject of a future individual or general Department of the Army permit application for fill or other development, except as permitted in the restricted covenants found in Appendix G of the mitigation plan or for the purposes of enhancing or restoring the mitigation associated with this project. These covenants will be recorded with the Registrar of Deeds or other appropriate official charged with the responsibility for maintaining records to or interest in real property. Proof of this documentation must be provided to the U.S. Army Corps of Engineers, Seattle District, Regulatory Branch within 90 days of permit issuance.

o. No irrigation can be performed in any mitigation area for more than 3 consecutive years without written approval from the Corps. No irrigation may be performed after Year 4 in any mitigation area without written approval from the Corps.

p. The timing of the riparian buffer enhancement plantings (the area extending a horizontal distance of 100 feet from the OHWM of the stream or from the edge of riparian wetlands, whichever is greater) along Des Moines Creek will be coordinated with the construction schedule of the regional detention facility and will be planted no later than the end of 2007, without prior written approval of the Corps.

q. All of the “Delineated Wetlands Verified by ACOE” as shown on Sheets 3 and 4 of the permit drawings that are not being filled as part of this permit will be redelineated in mitigation monitoring years 5, 10, and 15. For those wetlands where the NRMP proposes to expand or otherwise modify the existing wetland boundaries, the post mitigation construction wetland boundaries must be delineated to insure the area of the new wetlands at least equals the proposed NRMP wetland area. Maps will be included in the yearly mitigation monitoring report and provided to the U.S. Army Corps of Engineers, Seattle District, Regulatory Branch. If the size of any of the wetlands have decreased, additional mitigation may be required. There is one exception to this condition: 1) The boundary of Wetland 43 will not be redelineated because there are no anticipated indirect impacts.

r. To monitor for the occurrence of any unforeseen indirect impacts and to identify potential adaptive management strategies, the monitoring protocols outlined in the memorandum titled *Changes to groundwater monitoring protocol in wetlands adjacent to Master Plan Construction Projects* dated 28 October 2002 will be implemented. Results of the monitoring will be included in the yearly mitigation report and provided to the U.S. Army Corps of Engineers, Seattle District, Regulatory Branch.

13. Findings. The work complies with State and local laws and is consonant with National policy, statutes, and administrative directives. I find issuance of a Department of the Army permit for this work is based upon a thorough analysis of the various evaluation factors and determinations that have been identified herein. The proposed work is not contrary to the public interest. I have determined a Department of the Army permit with special conditions will be issued for the proposed work.

13 Dec 02
Date

Ralph H. Graves
RALPH H. GRAVES
Colonel, Corps of Engineers
District Engineer

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ACRONYMS

AASHTO	American Association of State Highway and Transportation Officials
ACC	Airport Communities Coalition
ACDP	Air Cargo Development Plan
ADS-B	automatic dependence surveillance-broadcast
AHFS	Aircraft Hydrant Fueling System
AILS	Airborne information for lateral spacing
ASDE	Airport Surface Detection Equipment
ASQP	Airline Service Quality Performance
ASTM	American Society for Testing and Materials
BA	Biological Assessment
B-IBI	Benthic Index of Biotic Integrity
BMP	Best Management Practice
CAA	Clean Air Act
CDTI	Cockpit Display Traffic Information
cfs	cubic feet per second
CO	Carbon monoxide
Corps	U.S. Army Corps of Engineers
CWA	Clean Water Act
CZM	Coastal Zone Management
DO	Dissolved oxygen
DoD	Department of Defense
Ecology	Washington State Department of Ecology
EDMS	Emissions and Dispersion Modeling System
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FAEED	FAA Aircraft Engine Emission Database
FAR	Federal Aviation Regulation
FEIS	Final Environmental Impact Statement
FHWA	Federal Highways Administration
FLAC	Fast Lagrangian Analysis of Continua
FMS	Flight Management System
FSEIS	Final Supplemental Environmental Impact Statement
GPS	Global positioning system
HPA	Hydraulic Project Approval
IFR	Instrument Flight Rules
ILS	Instrument landing system
IWS	Industrial Waste System
LDA	Local directional aid
LWD	Large woody debris
MOA	Memorandum of Agreement
MPU	Master Plan Update

ACRONYMS cont.

MSE	Mechanically stabilized earth
MTCA	Model Toxics Control Act
NAAQS	National Ambient Air Quality Standards
NAS	National Academy of Sciences
NED	National Economic Development
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NO_x	Nitrous oxides
NPDES	National Pollution Discharge Elimination System
NRMP	Natural Resource Mitigation Plan
PCHB	Pollution Control Hearings Board
pFAST	Passive final approach spacing tool
PGIS	Pollution generating impervious surfaces
PM_{10}	Particulate matter
Port	Port of Seattle
PRM	Precision Radar Monitoring
PSAPCA	Puget Sound Air Pollution Control Agency
PSATC	Puget Sound Air Transportation Committee
PSHA	Probabilistic Seismic Hazard Analysis
PSRC	Puget Sound Regional Council
RCAA	Regional Coalition of Airport Affairs
RCW	Revised Code of Washington
RED	Regional Economic Development
RGL	Regulatory Guidance Letter
ROD	Record of Decision
RSA	Runway Safety Area
SASA	South Aviation Support Area
SEPA	State Environmental Policy Act
SHPO	State Historical Preservation Officer
SIMMOD	Airport and Airspace Simulation Model
SIP	State Implementation Plan
SMP	Stormwater Management Plan
SPU	Seattle Public Utilities
STIA	Seattle-Tacoma International Airport
TAF	Terminal Area Forecast
TCAS	Traffic alert and collision avoidance system
USFWS	U.S. Fish and Wildlife Service
VFR	Visual Flight Rules
VOC	Volatile organic compounds
WDFW	Washington State Department of Fish and Wildlife
WHMP	Wildlife Hazard Management Plan
WQC	Water Quality Certification
WSDOT	Washington State Department of Transportation