MICHAEL CHEYNE

POLLUTION CONTROL HEARINGS BOARD
FOR THE STATE OF WASHINGTON

AIRPORT COMMUNITIES COALITION and CITIZENS AGAINST SEA-TAC EXPANSION,

Appellants,

v.

DEPARTMENT OF ECOLOGY and THE PORT OF SEATTLE,

Respondents.

No. PCHB 01-160

PREFILED TESTIMONY OF MICHAEL CHEYNE

AR 015949

Table of Contents

Identification of Witness 1

Summary of the Port's Master Plan Update Process. 2

The Public Process Leading to Project Recommendation 4

The Port's and FAA's Final Environmental Impact Statement 5

The Port's and FAA's Supplemental Environmental Impact Statement 5

The FAA's Record of Decision 5

Prior Litigation Has Upheld Master Plan Projects and Port's Extensive Mitigation 6

Ninth Circuit Upholds FAA's ROD 6

The FEIS and SEIS Are Upheld After Appeal to the Port's Hearing Examiner 7

FOSTER PEPPER & SHEFELMAN PLLC
1111 THIRD AVENUE, SUITE 3400
SEATTLE, WASHINGTON 98101-3299
206-447-4400

ORIGINAL

Superior Court and Court of Appeals Uphold the Port's Hearing Examiner 7
The Port Conducts Additional Environmental Review of Wetland Impacts 7
The FAA Conducts Additional Environmental Review and Determines No Supplemental EIS Is Required 8
Port Adopts FAA Environmental Evaluation and Conclusion That No Supplemental EIS Is Required 8
Ecology's 401 Certification 8
No Current Plans For Re-Development of Borrow Sources 8

FOSTER PEPPER & SHEFELMAN PLLC
1111 THIRD AVENUE, SUITE 3400
SEATTLE, WASHINGTON 98101-3299
206-447-4400

1. I have personal knowledge of the facts stated in this testimony and I am competent to testify to those facts.

2. Identification of Witness. I am currently the Director of Planning for the Port of Seattle for the Seattle-Tacoma International Airport (the "Airport"). I have been employed in that position since late 2001. Prior to that time, I was the project manager for the Master Plan Update construction projects at the Airport, including the third runway construction projects at the Airport. My responsibilities included overall program management for administration, planning, design and construction of the third runway and associated improvement. The third runway project is one of the major components of the Port of Seattle's Master Plan Update ("MPU"). I began the project manager position in May 1997.

3. I have considerable experience in the project management area. In addition to my twelve years at the Port of Seattle, I have over twelve years of administrative and project management experience in the public and private sectors including responsibilities as the Port Administrator for the Port of Friday Harbor and the Port of Edmonds. I have completed formal training in project management through the CH2M Hill Project Delivery System and through the Project Management Institute and have a Masters and Bachelors of Science degree from Western Illinois University. This declaration addresses the following topics:

(a) an overview of the Port's Master Plan process;

(b) an overview of the public planning process and Puget Sound Regional Council decisions that led to the decision that the region's air transportation needs require a third runway at the Airport;

(c) a brief history of the extensive environmental review performed by the FAA and the Port of Seattle for the Port's Master Plan Update projects;

(d) an overview of the prior litigation, including decisions from the U.S. Ninth Circuit Court of Appeals and the Washington State Court of Appeals, which have upheld the Port's Master Plan update projects against numerous legal challenges.

FOSTER PEPPER & SHEFELMAN PLLC
1111 THIRD AVENUE, SUITE 3400
SEATTLE, WASHINGTON 98101-3299
206-447-4400

4. Summary of the Port's Master Plan Update Process. The Master Plan Update process conducted by the Port serves as the principal means to identify and correct deficiencies in the commercial aircraft operation functions at the Airport. The Airport currently faces immense challenges and deficiencies. The Airport is the only major commercial airport in the Puget Sound Region and, as such, it plays a crucial role in the region's transportation infrastructure, namely to provide the needed capacity for individuals to travel and for goods to move to and from this region. The Airport thus serves an indispensable role for the travelling public and region's businesses.

5. In my opinion, the Airport's current deficiencies require immediate corrective action. These deficiencies include, but are not limited to: (a) delays in aircraft arrivals and departures that occur in poor weather conditions when only one runway can be used; (b) inadequate parking facilities to address existing and projected demand; (c) inadequate road access for south Airport traffic; and (d) inadequate terminal facilities to accommodate existing and projected passengers.

6. The purpose of the Port's Master Plan Update projects was succinctly stated by the Federal Aviation Administration (FAA) in its 1997 Record of Decision on this project:

> As documented in ... the Final Environmental Impact Statement, ... the present runway configuration, with two closely-spaced runways, is currently responsible for significant airside delays, particularly during poor weather conditions, and is forecast to be responsible for increasing such delays in the future.

As approved by both the Puget Sound Regional Council (the regional transportation planning body for the four-county Puget Sound region) and by the FAA, the Port is proposing to reduce existing and future Airport delays by constructing improvements pursuant to a Master Plan Update adopted by the Port and the FAA in 1997. These improvements include the following: (a) a new 8,500-foot parallel air-carrier runway located west of the existing runways; (b) a 600-foot extension of Runway 34R; extension of runway safety areas ("RSAs") at the ends of the existing runways; (c) terminal improvements and expansion including the development of a new terminal, parking, and access improvements north of the existing terminal; (c) the South Aviation Support Area (SASA) to

FOSTER PEPPER & SHEFELMAN PLLC
1111 THIRD AVENUE, SUITE 3400
SEATTLE, WASHINGTON 98101-3299
206-447-4400

accommodate aircraft line maintenance and air cargo facilities; and (e) relocation, redevelopment, and expansion of support facilities.

7. Some of the Master Plan Update projects will involve the discharge of fill material into waters of the U.S., which requires a §404 permit from the U.S. Army Corps of Engineers. This, in turn, has triggered the need for a §401 certification from Washington State Department Ecology. It is important to note that the Port's planned improvements at the Airport include a wide range of projects, only some of which involve discharges into waters of the U.S. For example, the Port is implementing extensive terminal, ground transportation, and other improvements that involve no discharge of fill material into waters of the U.S., and thus do not require §404 approval or §401 certification.

8. Pursuant to the FAA-approved Master Plan Update, the Port has begun improvements at the Airport in upland areas where §404 permit or §401 approvals are not required. Some of these improvements, such as expansion of the parking garage, are unrelated to any projects that require §404 approval. Other improvements, such as the placement of fill in upland areas for the Third Runway, are related to projects that require §404/401 approval. In beginning these improvements, the Port recognizes that this construction is being done at the Port's risk. The need for these improvements is so great, and the time constraints so severe, that the Port concluded that construction must begin without delay.

9. With regard to those aspects of its improvements that do involve discharges of fill material into waters of the U.S., the Port has proposed extensive mitigation to restore and address impacts to wetlands, to protect streams, to develop new wetlands, and to construct stormwater facilities that will detain and treat stormwater, including a retrofit of the existing Airport stormwater system. Those extensive mitigation plans are detailed in the testimony of other witnesses and will not be repeated here.

FOSTER PEPPER & SHEFELMAN PLLC
1111 THIRD AVENUE, SUITE 3400
SEATTLE, WASHINGTON 98101-3299
206-447-4400

10. The Public Process Leading to Project Recommendation. The proposal to construct a third runway and other improvements at the Airport was arrived at after years of study, debate, and decision-making by governmental bodies and elected officials in the Puget Sound region.

11. In 1989, the Puget Sound Regional Council and the Port appointed the 39-member Puget Sound Air Transportation Committee ("PSATC"), with representatives from cities and counties throughout the region, aviation industry experts, citizens, and the State of Washington. The purpose of the PSATC was to develop a regional solution to the region's worsening air traffic capacity problem. The PSATC reviewed a wide range of options, including replacement airports, supplemental airports, new technologies, demand management, and high-speed rail. The PSATC prepared a programmatic environmental impact statement ("EIS") examining the potential environmental impacts of the studied alternatives.

12. In 1992, the PSATC issued its final report and final EIS, recommending a multiple Airport system that included a third air carrier runway at the Airport. In accordance with the PSATC recommendation, the Port prepared a comprehensive update to its Master Plan to address the long-term facility needs at the Airport.

13. At the same time, the Port and the FAA entered into a memorandum of agreement to jointly prepare a project-specific EIS that would meet the requirements of both the National Environmental Policy Act and the State Environmental Policy Act.

14. Simultaneously with these EIS processes, the Puget Sound Regional Council undertook a review and decision process culminating in the adoption of PSRC Resolution A-93-03 which stated: That the region should pursue vigorously, as the preferred alternative, a major supplemental Airport and a third runway at the Airport. The PSRC then conducted, over the course of a year, an evaluation and public review of twenty-six existing and potential new airport sites. The PSRC concluded in October 1994 that a supplemental Airport was not feasible. Following further deliberations, in July 1996, the PSRC amended the Metropolitan Transportation Plan to include a third runway at the Airport as the region's plan to improve commercial air transportation capacity. This measure was passed by an

FOSTER PEPPER & SHEFELMAN PLLC
1111 THIRD AVENUE, SUITE 3400
SEATTLE, WASHINGTON 98101-3299
206-447-4400

overwhelming majority at the PSRC General Assembly, with the small minority of dissenting voices coming from the cities who are members of the Airport Communities Coalition.

15. The Port's and FAA's Final Environmental Impact Statement. In February 1996, the Port and FAA issued a Final Environmental Impact Statement ("FEIS") for the proposed master plan development actions at the Airport. The FEIS discussed the impacts of the preferred alternative and a number of other on-site alternatives at the Airport. Off-site alternatives had been considered in the Flight Plan Environmental Impact Statement issued by the Port and the Puget Sound Regional Council ("PSRC").

16. The Port's and FAA's Supplemental Environmental Impact Statement. After the FEIS was issued, the FAA and Port realized that the growth in air transportation demand at the Airport was higher than the range of forecasts on which the FEIS had been based. Accordingly, the FAA and Port issued a full Supplemental Environmental Impact Statement ("SEIS"). The SEIS was published in May 1997.

17. The FAA's Record of Decision. On July 3, 1997, the FAA published its Record of Decision for the Master Plan Update Development Actions at the Airport ("ROD"). A true and correct of the FAA's ROD (without appendices) is attached as Exhibit A to this declaration. The FAA determined that the environmental review (the FEIS and SEIS) for the project were legally adequate, and further determined that no possible and prudent alternative to the project existed and that every reasonable step had been taken to minimize the project's adverse environmental effects. The FAA also determined that the project would conform with applicable air quality standards.

18. The ROD also contained an analysis of the impacts of the project and a list of mitigation measures required by the FAA. As required by federal law, the ROD concluded that

> all practical means to avoid or minimize environmental harm have been adopted through appropriate mitigation planning.

The ROD also set forth additional monitoring and enforcement programs. The ROD mitigation measures include noise, land use, archeological, cultural and historic resources, social and induced

FOSTER PEPPER & SHEFELMAN PLLC
1111 THIRD AVENUE, SUITE 3400
SEATTLE, WASHINGTON 98101-3299
206-447-4400

socio-economic impacts, air quality, water quality, construction, erosion and sedimentation control, wetlands, flood planes, surface transportation, plants and animals, services/utilities, earth, hazardous substances, and construction impacts. In Appendix F to the ROD, the ROD includes a graphic summary of the mitigation measures required by the FAA based on the FEIS/FSEIS.

19. Prior Litigation Has Upheld Master Plan Projects and Port's Extensive Mitigation. Earlier court decisions regarding the Port's overall Master Plan Update projects has specifically recognized that the Port is providing extensive mitigation for noise impacts, air quality impacts, construction impacts, land use impacts, transportation impacts, and other mitigation for the impacts of the planned development at Airport – as well as the mitigation for the water quality impacts of the Master Plan Update development actions.

20. The Airport Communities Coalition (ACC) has brought a string of lawsuits challenging every agency and Port decision related to the third runway and Master Plan Update improvements at the Airport. The goal of the ACC, as stated in the Interlocal Agreement forming the ACC, is "To stop the construction of any additional runways at Seattle Tacoma International Airport." A copy of the Interlocal Agreement forming ACC is attached as Exhibit B.

21. Ninth Circuit Upholds FAA's ROD. The Airport Communities Coalition appealed the ROD to the Ninth Circuit Court of Appeals. The Ninth Circuit upheld the FAA's ROD. A true and correct copy of the Ninth Circuit decision upholding the ROD is attached as Exhibit C to this declaration.

FOSTER PEPPER & SHEFELMAN PLLC
1111 THIRD AVENUE, SUITE 3400
SEATTLE, WASHINGTON 98101-3299
206-447-4400

22. The FEIS and SEIS Are Upheld After Appeal to the Port's Hearing Examiner. In addition to appealing the ROD, the ACC also appealed the legal adequacy of the FEIS and SEIS to the Port's independent Hearing Examiner. The Port of Seattle has an officially established SEPA administrative appeal process establishes that administrative appeal process. The Port's independent Hearing Examiner determined that the FEIS and SEIS for the Master Plan Update development actions were legally adequate.

23. Superior Court and Court of Appeals Uphold the Port's Hearing Examiner. The decision of the Port's independent Hearing Examiner was further appealed by ACC to the King County Superior Court. The Superior Court upheld the Hearing Examiner's decision and determined that the FEIS and SEIS were legally adequate. A true and correct of the Superior Court's Findings of Fact, Conclusions of Law and Final Order is attached as Exhibit D. The Superior Court decision was further appealed to Division One of the Washington State Court of Appeals. The Court of Appeals upheld the Port's Hearing Examiner and the King County Superior Court and affirmed that the Port's environmental review was legally adequate. A true and correct copy of the published Division One opinion is attached as Exhibit E.

24. The Port Conducts Additional Environmental Review of Wetland Impacts. As new information regarding the Port's Master Plan Update developments has come to light, both the Port and FAA have continued to conduct environmental review of the project's impacts. As part of that review, the Port issued a SEPA Addendum on January 24, 2000. In the addendum, the Port re-evaluated wetland impacts in light of the refined delineations of wetlands. The Port concluded that the functions of the additional wetlands were essentially the same as those analyzed in the FEIS and SEIS. More importantly, the Port concluded that the extensive mitigation commitments will compensate for the adverse impacts to wetland functions. The January 24, 2000 Addendum also discussed the impact of the development of temporary, construction-only interchanges. Those interchanges were planned in order to decrease truck traffic impacts on surface streets in surrounding communities. To ensure adequate mitigation, the Port also committed to construction of noise attenuation walls along portions of the

FOSTER PEPPER & SHEFELMAN PLLC
1111 THIRD AVENUE, SUITE 3400
SEATTLE, WASHINGTON 98101-3299
206-447-4400

temporary interchange, acquisition of residences closest to the interchanges, and sound insulation of affected residences.

25. The Port has conducted additional environmental review of other project elements as additional information has been developed – including a May 2000 Addendum regarding the proposed 67-acre wetland mitigation site near the Green River in Auburn.

26. The FAA Conducts Additional Environmental Review and Determines No Supplemental EIS Is Required. In response to suggestions that another supplemental environmental impact statement might be required, on August 8, 2001, the FAA issued a formal Environmental Reevaluation in a revised Record of Decision. A true and correct copy of the FAA Reevaluation is attached as Exhibit F. As part of its Reevalution, the FAA issued a formal, appealable order that preparation of a new supplemental environmental impact statement was not warranted. Neither the ACC nor any other party appealed that FAA order.

27. Port Adopts FAA Environmental Evaluation and Conclusion That No Supplemental EIS Is Required. On August 10, 2001, the Port formally adopted those portions of the FAA Reevaluation on which the Port had not already issued supplemental environmental review, including the conclusion that a supplemental EIS was not required. A true and correct copy of the August 10, 2001 Port adoption is attached as Exhibit G.

28. Ecology's 401 Certification. In September 2001, Ecology issued its Amended 401 Certification and Coastal Zone Management Act certification, which has been appealed to the Pollution Control Hearings Board. That certification was preceded by public notice in 1997, a revised public notice in September 1999, and yet a third public notice in December 2000. There have been numerous public hearings and opportunities to comment on the 404 application and the 401 certification process, resulting the most extensively reviewed 401 certification ever issued by the Department of Ecology.

29. No Current Plans For Re-Development of Borrow Sources. There are currently no plans for redevelopment of the Port's proposed on-site borrow sources with any development that would add impervious surface. Predicting the potential future development of those sites is speculative at this time.

FOSTER PEPPER & SHEFELMAN PLLC
1111 THIRD AVENUE, SUITE 3400
SEATTLE, WASHINGTON 98101-3299
206-447-4400

Should any of the sites be redeveloped in the future, full environmental review and mitigation of impacts would occur at that time.

I declare under penalty of perjury under the laws of the state of Washington that the foregoing is true and correct.

Executed at Seattle, Washington, this 6 day of March 2002.

Michael Cheyne

FOSTER PEPPER & SHEFELMAN PLLC
1111 THIRD AVENUE, SUITE 3400
SEATTLE, WASHINGTON 98101-3299
206-447-4400

PRE-FILED TESTIMONY OF MICHAEL CHEYNE

EXHIBITS

A	FAA's ROD (without appendices)
B	Interlocal Agreement forming ACC
C	Ninth Circuit decision upholding the ROD
D	Superior Court's Findings of Fact, Conclusions of Law and Final Order
E	Published Division One Opinion upholding the Port's Hearing Examiner and the King County Superior Court and affirming that the Port's environmental review was legally adequate
F	FAA Reevaluation
G	August 10, 2001 Port adoption

A

U. S. DEPARTMENT OF TRANSPORTATION

FEDERAL AVIATION ADMINISTRATION

NORTHWEST MOUNTAIN REGION

RECORD OF DECISION

FOR THE

MASTER PLAN UPDATE DEVELOPMENT ACTIONS

SEA-TAC INTERNATIONAL AIRPORT

JULY 3, 1997

TABLE OF CONTENTS

SECTION		PAGE
I.	INTRODUCTION	3
II.	BACKGROUND	3
III.	THE PROPOSED AGENCY ACTIONS AND APPROVALS	6
IV.	ALTERNATIVES ANALYSIS	7
V.	THE AGENCY FINDINGS	16
VI.	MITIGATION	30
VII.	DECISION AND ORDER	44

APPENDICES

A. Summary of Master Plan Update improvement phasing, years 1997 through 2010.

B. State of Washington Air/Water Quality Certifications.

C. Assessment of Runway Length and Location For The Third Parallel Runway.

D. Comments and Responses thereto concerning FSEIS (exclusive of air quality).

E. Comments and Responses thereto concerning FSEIS Final Air Quality Conformity Analysis.

F. Graphic Summary of Mitigation.

G. FAA Benefit/Cost analysis of third runway.

I. INTRODUCTION

This Record of Decision (ROD) provides final Federal Aviation Administration (FAA) approval for the Master Plan Update development actions adopted by the Port of Seattle (POS) on August 1, 1996, in POS Commission Resolution # 3212, as amended on May 27, 1997, in POS Commission Resolution No. 3245.

This ROD provides final approval for those agency actions necessary in order to provide FAA support for a new 8500-foot dependent air carrier runway, for a 600 foot southerly extension of runway 16L/34R, for expanded runway safety areas for runways 16R and 16L, and for various landside Master Plan Update improvements scheduled to be completed through the year 2010. The phasing of these various projects is graphically presented on pages 2-22 to 2-23 of the Final Supplemental Environmental Impact Statement [FSEIS], and is also presented in Appendix A of this ROD.

II. BACKGROUND

Over the past decade, the Federal Aviation Administration (FAA) has worked closely with local and regional officials and with the Port of Seattle (POS) aviation planning staff to investigate ways in which to accommodate the increasing passenger and operational activity demands at Seattle-Tacoma International Airport (Sea-Tac). As documented in Chapter I of the Final Environmental Impact Statement (FEIS) and in Chapter 2 of the FSEIS, the present airport runway configuration, with two closely-spaced runways, is currently responsible for significant airside delays, particularly during poor weather conditions, and is forecast to be responsible for increasing such delays in the future. Furthermore, the present design and configuration of airport landside facilities cannot adequately accommodate projected increases in activity without severe landside congestion.

On the regional level, the FAA has worked for a number of years with the local metropolitan planning organization [currently entitled the Puget Sound Regional Council (PSRC)], and with other local planning agencies, to find solutions to the related problems of inadequate capacity and increasing delays which are forecast for Sea-Tac. The FAA participated in the 1989-1992 Flight Plan Study, which recommended a multiple airport system that included a new runway at Sea-Tac. The agency also funded a PSRC study of the feasibility of a major supplemental airport, which concluded on October 27, 1994, with PSRC Resolution # EB-94-01, determining that there were no feasible sites for such a airport, and deciding not to proceed with further such studies on

a regional level (See FEIS Appendix B for detailed information on regional alternatives).

On January 5, 1994, the FAA began the public phase of the environmental process involving POS site-specific development proposals, which included a third Sea-Tac runway, by announcing in the Federal Register its intent to prepare an Environmental Impact Statement (EIS), and by requesting scoping comments (59 Fed. Reg. 645). Scoping meetings were held with the general public and with Federal, State and local agencies on February 9 and 10, 1994 (See FEIS Appendix A for detailed information on this scoping process).

During this same time frame, the POS began its Master Plan Update study, designed to develop recommendations for improvements to Sea-Tac which would reduce existing and forecasted poor weather aircraft operating delay and would accommodate forecasted growth in passengers, cargo, and aircraft operations. The Master Plan Update study process occurred concurrently with the initial environmental studies discussing the impacts of the development actions being proposed.

On April 24, 1995, the FAA published in the Federal Register a Notice of Availability of the Draft Environmental Impact Statement (DEIS) [60 Fed. Reg. 20149]. Public comments were taken on the DEIS from the date of its release until August 3, 1995. During the comment period, two public hearings were held, on June 1, 1995 and June 14, 1995. Final Environmental Impact Statement (FEIS) Appendix T, located in Volumes 5, 6, and 7, contains the transcript from the public hearings, and letters commenting on the DEIS which were received from the public and government agencies. FEIS Volume 4, Appendix R contains responses to the issues presented during the comment period.

The FEIS, approved by the FAA on February 1, 1996, was released to the public on February 9, 1996 (see 61 Fed. Reg. 5056). The FEIS addressed areas of public concern by way of modifications to the DEIS text and specific responses to public comments.

The U.S. Environmental Protection Agency (EPA) published a notice of the availability of the approved FEIS, pursuant to 40 CFR 1506.10 (61 Fed. Reg. 6243) in the Federal Register on February 16, 1996.

Although the FAA did not solicit public comments on the FEIS (on issues other than air quality conformity), several public agencies, community groups, and citizens nevertheless submitted written comments for agency consideration on the FEIS. Appendix A of the Final Supplemental Environmental Impact Statement

(FSEIS) responds to substantive agency and public comments on the FEIS, other than those pertaining to air quality conformity.

On July 11, 1996, in Resolution A-96-02, the PSRC General Assembly approved an amendment to the Metropolitan Transportation Plan to include a third runway at Sea-Tac Airport, with specific noise reduction measures based upon the recommendations of an expert Panel.

On August 1, 1996, the Commissioners of the Port of Seattle met to discuss the Master Plan Update proposals discussed in the FEIS. During the course of that meeting, by approving Resolution No. 3212, they adopted and approved a preferred development alternative, and authorized implementation of the first phase of those development actions. To date, due to the superseding events discussed below, no such implementation activity has taken place.

In May of 1996 the FAA Northwest Mountain region became aware of the fiscal year 1996 Terminal Area Forecast (TAF) prepared by the FAA headquarters Office of Policy and Plans. The TAF suggested that the air travel demand forecasts used in the Master Plan Update may have significantly understated the actual demand currently being experienced at Sea-Tac Airport and likely to be experienced at the airport in the foreseeable future. Over the next six months, a more detailed reexamination of those national forecasts, with more focus upon local conditions, was undertaken by the FAA and the Port of Seattle, together with their consultants. In December 1996, the FAA decided that a Supplemental EIS (SEIS) was necessary in order to reexamine, with public participation, how this anticipated growth might affect the conclusions reached in the February 1996 FEIS.

By Federal Register notice dated December 27, 1996 [61 Fed. Reg. 68327], the FAA published a Notice of Intent to prepare this SEIS. On February 4, 1997, the FAA and the POS released a Draft SEIS to the public. A public notice of availability of the Draft SEIS was published in local newspapers on February 9, 1997, in the Federal Register on February 13, 1997 [62 Fed, Reg. 6831] and by the Environmental Protection Agency [EPA] on February 14, 1997 [62 Fed. Reg. 6969]. A public hearing was held at the Sea-Tac International Airport on March 4, 1997, during which oral comments were taken from approximately 26 members of the public. By the March 31, 1997, close of the public comment period, 85 written public comments on the DSEIS had been received [reprinted at Final SEIS Appendix G]. All substantive oral and written public comments [including those pertaining to air quality conformity] are responded to in Appendix F of the FSEIS.

On May 13, 1997, the FAA signed and released the FSEIS to the public. A public notice of availability of the FEIS was published in local newspapers on May 19, 1997, in the Federal Register on May 21, 1997 [62 Fed. Reg. 27831] and by the Environmental Protection Agency [EPA] on May 23, 1997 [62 Fed. Reg. 28469]. Although not solicited, further public comments (not pertaining to air quality) were received on the FSEIS, which are responded to in Appendix D of this ROD. Public Comments on the FSEIS Air Quality analysis are responded to in Appendix E of this ROD.

On May 27, 1997, the Commissioners of the Port of Seattle met to discuss the Master Plan Update proposals discussed in the FSEIS. During the course of that meeting, by approving Resolution No. 3245, they again adopted and approved a preferred development alternative [as outlined in Appendix A of this ROD], and authorized immediate implementation of the first phase of those development actions.

III. THE PROPOSED AGENCY ACTIONS AND APPROVALS

FEIS page II-42 outlines a variety of actions that will require Federal approval prior to undertaking the proposed development actions. The majority of these actions will require FAA approval. However, the U.S. Army Corps of Engineers, a cooperating agency for the FEIS, will be responsible for permitting processes under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. The necessary FAA actions, determinations and approvals are summarized below.

a. Determination of project eligibility for Federal grant-in-aid funds (49 U.S.C. § 47101, et. Seq.) and Passenger Facility Charge [PFC] funds (49 U.S.C. § 40117), for land acquisition and relocation (49 CFR Part 24), site preparation, runway, taxiway, runway safety area, and other airfield construction, terminal and related landside development, navigational and landing aids, and environmental mitigation.

b. Conclusions regarding air quality conformance of the proposed facility with applicable air quality standards under the Clean Air Act, as amended. (42 U.S.C. § 7506, Section 176(c)(1)), and 40 CFR Part 93).

c. Approval for relocation/upgrade of the existing airport traffic control tower and various navigational aids (49 U.S.C. § 44502(a)(1)).

d. Decisions 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, including the

development of a system for the routing of arriving and departing traffic and the design, establishment, and publication of standardized flight operating procedures, including instrument approach procedures and standard instrument departure procedures (49 U.S.C. § 40103(b)).

e. Determinations, through the aeronautical study process, under 14 CFR Part 77, regarding obstructions to navigable airspace (49 U.S.C. § 40103(b) and 40113).

f. Determinations under 14 CFR Part 157 as to whether or not the agency objects to the airport development proposal from an airspace perspective, based upon aeronautical studies (49 U.S.C. § 40113(a)).

g. Determinations under the 49 U.S.C. Sections 47106 and 47107 pertaining to FAA funding of airport development [including approval of a revised airport layout plan (ALP), 49 U.S.C. § 47107(a)(16)], Environmental approval (see 42 U.S.C. §§ 4321-4347, and 40 CFR § 1500-1508), and approvals under various executive orders discussed in the ROD.

h. A certification that the proposed facility is reasonably necessary for use in air commerce or for the national defense (see 49 U.S.C. § 44502(b)).

IV. ALTERNATIVES ANALYSIS

The Master Plan Update Study process identified four broad development needs at Sea-Tac, which formed the basis for the site-specific EIS. These four needs, discussed in detail in FEIS Chapter I and in FSEIS Chapter 2, are summarized as follows:

(1) Improve the poor weather airfield operating capability in a manner that accommodates aircraft activity with an acceptable level of aircraft delay;

(2) Provide sufficient runway length to accommodate warm weather operations without restricting passenger load factors or payloads for aircraft types operating to the Pacific Rim;

(3) Provide Runway Safety Areas (RSA's) that meet current FAA standards; and

(4) Provide efficient and flexible landside facilities to accommodate future aviation demand.

FEIS Chapter II and FSEIS Chapter 3 discuss in detail the alternatives considered by the FAA and the POS during the EIS study process for each of these four identified needs. For each need, the no action alternative was also considered. A summary of the FAA's consideration of alternatives for each of these needs is set forth below:

(1) Improve the poor weather airfield operating capability in a manner that accommodates aircraft activity with an acceptable level of aircraft delay;

The Puget Sound region of Western Washington is renowned for its poor weather, characterized by frequent precipitation, clouds and fog. Under FAA aircraft separation criteria, the two existing Sea-Tac runways are too close together to permit simultaneous approaches to both runways during much of this poor weather. Under these weather conditions, therefore, there is but one usable approach path for aircraft landing at Sea-Tac. A one runway airport operates much differently from a multiple runway airport in terms of its ability to accommodate aircraft landings during periods of heavy air traffic demand. The FEIS and FSEIS document the current and forecasted aircraft delays resulting from the inadequate spacing of the two existing Sea-Tac runways, and the resulting single approach stream of air traffic during poor weather.

As noted at the beginning of this ROD, the FAA has participated for many years in regional attempts to find a solution to the Sea-Tac delay problem through the development of a replacement or supplemental airport or airports, or the expanded use of existing airports, in the Puget Sound region, in order to reduce the aircraft demand existing at and forecast for Sea-Tac (see FEIS Appendix B). However, for the reasons documented in the EIS and SEIS, the FAA has concluded that these regional solutions are currently not reasonable alternatives to meet the defined need. Likewise, the FAA has considered the reduction and management of demand at Sea-Tac through the use of other modes of transportation, demand and system management alternatives, and the use of additional air traffic and flight technology alternatives, and concluded that these alternatives would not meet the defined need.

As discussed at FEIS I-13 and at FSEIS 3-5 to 3-6, the FAA and the POS have in recent years made a number of procedural and technological improvements at Sea-Tac, which have increased the efficiency of the air traffic flow. However, we have now exhausted all known available and reasonable improvements of this nature. Additional technological and procedural alternatives which have been suggested are not reasonable solutions to the defined need, for the reasons explained at FEIS II-14 through II-

18, and in response to public comments in FEIS Appendix R and in FSEIS Appendix F.

Finally, the FAA has considered the use of delayed or blended alternatives as a means to avoid the immediate construction of a new runway at Sea-Tac. For the reasons discussed in FSEIS pages 3-6 to 3-7, the FAA and the POS have decided that limitations on financial resources, and a refined consideration of the construction process, require extending the runway construction period and delaying the commissioning of the runway until late in the year 2004. It is recognized that this delay will cause significant inconvenience to the traveling public and additional costs to airport users. However, the phasing plan outlined at FSEIS pages 2-22 to 2-23 represents a compromise which balances construction-related financial constraints with the costs associated with rapidly increasing airside delays.

As part of the POS Master Plan Update, an extensive evaluation was undertaken, summarized at FEIS pages II-12-14, to identify the appropriate alignment, spacing and length for a proposed third runway. The FAA worked closely with the POS to develop the assumptions and methodologies during this portion of the alternatives evaluation, which relied upon FAA design standards and the results of recent FAA Capacity Enhancement Plan updates. The FAA believes that this evaluation process was appropriately conducted, and therefore does not consider it necessary, in its independent Federal consideration of alternatives, to undertake a de novo comprehensive alternatives analysis of alignment, spacing, and length issues. The Port of Seattle, as the sponsor and airport operator, has the fundamental role of planning and developing aviation facilities at Sea-Tac.

Considered further in FEIS Chapter IV and in FSEIS Chapter 5, were the reasonably foreseeable environmental consequences of the Do-Nothing/No-Build alternative and the site-specific runway development alternatives. These evaluations concluded that the proposed third runway project would not result in any significant environmental impacts which could not be adequately mitigated [see ROD Section VI and Appendix F for summaries of mitigation].

The Port's decisions, at its August 1, 1996, and May 27, 1997, Commission meetings, to proceed with a third parallel runway spaced at 2500 feet from runway 34R/16L, and 8500 feet in length, are well supported by airspace, engineering, environmental, and financial considerations, as documented in the Master Plan Update and in the FEIS and FSEIS.

Under the Do-Nothing/No-Build alternative, a third runway at Sea-Tac would not be developed now or in the near future. However, Federal adoption of this alternative would fail to alleviate the

current and forecast airside delays at Sea-Tac which are documented in the FEIS and FSEIS. Although the FEIS and FSEIS find that, with appropriate mitigation, the POS preferred alternative will have no significant environmental impacts, the Do-Nothing/No-Build Alternative would still be the least environmentally impacting alternative, and thus the Do-Nothing/No-Build alternative is environmentally preferable. However, since it would fail to accomplish the principal purpose and need for the project, this alternative is not supported by the FAA.

In its consideration of alternatives, the FAA has been mindful of its statutory charter to encourage the development of civil aeronautics and safety of air commerce in the United States (49 U.S.C. 40104). We have also considered the congressional policy declaration that airport construction and improvement projects that increase the capacity of facilities to accommodate passenger and cargo traffic be undertaken to the maximum feasible extent so that safety and efficiency increase and delays decrease (49 U.S.C. 47101(a)(7)).

As a further policy consideration, the construction and operation of the proposed third Sea-Tac runway will alleviate delays and congestion at Sea-Tac International Airport, as extensively documented in the administrative record for this ROD. Although the $587 million cost for property acquisition, runway construction, and environmental mitigation (as specified in the SEIS) is significant by any standard, the annual delay savings from an 8500 foot new runway are expected to be approximately $438 million by the year 2005, and $646 million by the year 2010. ROD Appendix G presents a recent Benefit-Cost Analysis for the third runway project, prepared by the agency's System and Policy Analysis Division at FAA headquarters. That analysis reflects that the total benefit of the proposed runway exceeds the total project cost by a factor of approximately 5, based upon a comparison of present values of benefits and costs. Based upon the Appendix G figures, discounted to present value, it is evident that if the third runway becomes operational by the year 2005, the delay savings will compensate for the runway costs within a two year period.

Although the benefit/cost analysis reflects savings from both airline operation and passenger delays, there are other more qualitative considerations. The FAA and the POS seek to relieve passenger and public inconvenience, and to make travel to and from this region more attractive by reducing travel delay and uncertainty. The FAA therefore concludes that the third runway project is both cost effective, and otherwise worthy of Federal support through the approvals in this ROD.

This support and these approvals do not, however, suggest that an FAA commitment to provide a specific level of financial support for the new runway project has yet been made. Future FAA discretionary funding decisions will be based upon the statutory criteria set forth in 49 U.S.C. § 47115(d), and upon the FAA policy announced in the Federal Register on June 24, 1997 (62 Fed. Reg. 34108), or under subsequent revisions to that agency policy.

After careful consideration of the analysis of the impacts of the various alternatives considered, and of the ability of these alternatives to satisfy the identified purpose and need for this proposal; and after review and consideration of the testimony at the various public hearings, of the comments submitted in response to the circulation of the DEIS, FEIS, DSEIS and FSEIS and of coordination with Federal, state and local agencies; and after considering the policy matters discussed above; the FAA hereby selects the runway alternative adopted and approved for construction by the POS on August 1, 1996, and on May 27, 1997, as the FAA's preferred runway alternative.

(2) Provide sufficient runway length to accommodate warm weather operations without restricting passenger load factors or payloads for aircraft types operating to the Pacific Rim.

The FEIS documents the inability of existing Sea-Tac runways (at 9,425 and 11,900 feet) to service unrestricted warm weather non-stop operations to Pacific Rim destinations. The inability of Sea-Tac to accommodate unrestricted operations to these destinations is expected to result in ever-increasing airline economic losses throughout the planning period (estimated at $1.2 million in the year 2000 and $2 million by the year 2010).

The Master Plan Update determined that a 12,500 foot runway is the minimum length necessary to permit unrestricted B747-200B operations at 76°F. Although consideration was given to meeting this need by extending runway 16R/34L to a length of 12,500 feet, this alternative was rejected as unreasonable due to impacts on wetlands and the expense of roadway relocations, as discussed in the FEIS. Consideration was also given to development of a new third runway with a 12,500 foot length, but this alternative was also rejected due to the extensive disruption of existing development and the expense associated with roadway relocation, as discussed in the FEIS. The FEIS identifies a 600 foot southward extension of Runway 16L/34R as being the most cost effective and least environmentally damaging development alternative. The net cost of this runway extension is estimated at $12,700,000.

With regard to the Delayed/Blended alternatives, although these were considered at FEIS page II-21, they were dismissed from further study and not chosen as the preferred alternative. Although the POS had not earlier identified a preferred development date for this aspect of the Master Plan Update (see FEIS footnote #19, page II-44), the Final SEIS [at page 2-22] states an intent to proceed with this development aspect of the Master Plan Update in the year 2010, when it is anticipated that this development project will become cost-effective (payback period estimated at 11.1 years in year 2000 but reduced to 6.5 years by the year 2010). In order to maintain the integrity of the FEIS environmental process, which requires the consideration of connected, cumulative and similar actions in one document, the FEIS and FSEIS evaluated this runway extension project during this EIS process. Under FAA Order 5050.4A paragraph 102.b., a written environmental reevaluation of this project will likely be required prior to the commencement of construction.

Under the Do-Nothing/No-Build alternative, a runway extension at Sea-Tac would not be developed now or in the foreseeable future. Although the FEIS and FSEIS find that, with appropriate mitigation, the POS preferred alternative will have no significant environmental impacts, the Do-Nothing/No-Build Alternative would still be the least environmentally impacting alternative, and thus the Do-Nothing/No-Build alternative is environmentally preferable. However, since it would fail to accomplish the principal purpose and need for the project, this alternative is not supported by the FAA.

Having considered the policies set forth at 49 U.S.C. sections 40104 and 47101, the ability of the available alternatives to meet the articulated need, and the administrative record which concerns the proposed runway extension, the FAA hereby selects as its preferred alternative the runway extension alternative identified in the FEIS as the POS planning staff's preferred alternative, as adopted by the POS as part of its Master Plan Update and ALP at its August 1, 1996, and on May 27, 1997, meetings.

The FAA's approval of the runway extension project in this ROD signifies that the project meets FAA standards for approval of the agency actions discussed in Section II of this ROD. It does not, however, signify an FAA commitment to provide financial support for the runway extension, which is a decision which may not be made unless and until the project can be justified under the criteria prescribed by 49 U.S.C. § 47115(d), and under the agency policy announced in the Federal Register on June 24, 1997 (62 Fed. Reg. 34108), or under subsequent revisions to that agency policy.

(3) Provide Runway Safety Areas (RSA's) that meet current FAA standards.

The FEIS documents the fact that existing Sea-Tac runways do not meet current FAA safety design standards, in that three of the four runway ends have RSA's which are of insufficient length to ensure safe operations in the event of aircraft runway overruns [As noted at FEIS I-18 and at FSEIS 4-3, the RSA for runway end 34L was brought into compliance in 1995]. FAA approval of the RSA for runway end 34R was provided in a FAA Record of Decision dated April 18, 1996, notice of which was given through publication of an announcement in several local newspapers [discussed at FSEIS 3-8 and 4-3]. Construction is expected to be completed in late 1997.

For the remaining two RSAs (16R and 16L), consideration was given to the Do-Nothing/No-Build alternative during the EIS process. A literal do nothing approach (See FEIS II-24, footnote #12) was rejected as an unreasonable option early in the process, since it would not address the immediate need to correct a runway design which does not meet current FAA standards. Considered further as part of the detailed analyses of development alternatives 2, 3, and 4, were the No-Build alternative (requiring the establishment of displaced threshold/declared distance procedures for each runway), and the POS preferred alternative, involving the construction of a 1,000 foot RSA for the two remaining runway ends, as well as standard size RSAs on both ends of the new proposed third runway.

Under the Do-Nothing/No-Build alternative, these runway safety area improvements at Sea-Tac would not be developed now or in the near future. Although the FEIS and FSEIS find that, with appropriate mitigation, the POS preferred alternative will have no significant environmental impacts, the Do-Nothing/No-Build Alternative would still be the least environmentally impacting alternative, and thus the Do-Nothing/No-Build alternative is environmentally preferable. However, since it would fail to accomplish the principal purpose and need for the project, this alternative is not supported by the FAA.

As explained at FEIS page II-23, the FAA does not favor the establishment of displaced threshold/declared distance procedures at Sea-Tac, for reasons of safety and efficiency. Accordingly, having considered the policies set forth at 49 U.S.C. sections 40104 and 47101, the ability of the available alternatives to meet the articulated need, and the administrative record which concerns the proposed RSA extensions, the FAA hereby selects as the FAA's preferred alternative the RSA extension alternative

adopted by the POS as part of its Master Plan Update and ALP, at its August 1, 1996, and May 27, 1997, meetings.

The FAA's approval of the RSA extension projects in this ROD signifies that the projects meet FAA standards for approval of the agency actions discussed in Section II of this ROD. It does not, however, signify an FAA commitment to provide a specific level of financial support for the RSA extensions, which is a future decision which will be made under the agency policy announced in the Federal Register on June 24, 1997 (62 Fed. Reg. 34108), or under subsequent revisions to that agency policy.

(4) Provide efficient and flexible landside facilities to accommodate future aviation demand.

The FEIS and FSEIS document the need to incrementally improve existing terminal and other landside facilities at Sea-Tac over the next several decades, in order to alleviate the congestion and passenger inconveniences anticipated to result from regional growth and increased demand for airport services.

During the EIS process, the FAA considered but rejected for further detailed evaluation, the reduction of demand at Sea-Tac landside facilities through the development of a replacement or supplemental airport or airports in the Puget Sound region, through the use of other modes of transportation, or through demand and system management alternatives. For the reasons discussed in the FEIS, the FAA concluded, as it did in the case of the proposed third runway project, that these alternatives were unreasonable.

Although Delayed/Blended alternatives were also rejected in the FEIS as not meeting the need for landside improvements, it should be noted that the POS originally planned to incrementally expand and improve the Sea-Tac landside facilities discussed in the FEIS over the next 25 years, as the need for specific improvements was justified by the rate of increased demand placed upon existing facilities. With the accelerated demand forecast in the FSEIS, the terminal and landside facilities are now needed even sooner than originally forecast in the FEIS, and accordingly, the Delayed/Blended alternative is an even more unreasonable alternative. The current project phasing plans documented at FSEIS pages 2-22 to 2-23 and in Appendix A to this ROD represent earlier timeframes for many of these terminal and landside facilities, in order to accommodate these increased demand forecasts.

Carried forward for detailed evaluation in FEIS Chapter IV, and considered also in FSEIS Chapter 5, were the Do-Nothing/No Build

alternative, along with three development alternatives, centered around a central terminal concept, a north unit terminal concept, and a south unit terminal concept. As part of the POS Master Plan Update, an extensive engineering and financial evaluation was undertaken by the POS, to evaluate these proposed landside improvements. The FAA worked closely with the POS to develop the assumptions and methodologies during this portion of the alternatives evaluation. The FAA believes that this evaluation process was appropriately conducted, and therefore does not consider it necessary, in its independent Federal FEIS consideration of alternatives, to undertake a de novo comprehensive alternatives analysis of these landside improvements. The Port of Seattle, as the sponsor and airport operator, has the fundamental role of planning and developing aviation facilities at Sea-Tac. The preferred alternative recommended in the FEIS and FSEIS by the POS's planning staff (the North Unit Terminal concept), is well supported by airspace, engineering, environmental, and financial considerations, as documented in the Master Plan Update and in the FEIS and FSEIS.

Under the Do-Nothing/No-Build alternative, these landside improvements would not be developed now or in the next several decades. However, Federal approval of this alternative would fail to alleviate the congestion and passenger inconveniences anticipated to result from regional growth and increased demand for airport services. Although the FEIS and FSEIS find that, with appropriate mitigation, the POS preferred alternative will have no significant environmental impacts, the Do-Nothing/No-Build Alternative would still have the fewest developmental impacts. However, the Do-Nothing/No-Build Alternative would not be the environmentally preferable alternative, since it would fail to alleviate the significant environmental impacts associated with increased surface transportation congestion, which the preferred alternative is designed to remedy. Furthermore, since the Do-Nothing/No-Build Alternative would fail to accomplish the principal purpose and need for these landside development projects, this alternative is not supported by the FAA.

Accordingly, having considered the policies set forth at 49 U.S.C. sections 40104 and 47101, the ability of the available alternatives to meet the articulated need, and the administrative record which concerns these landside development projects, the FAA hereby selects as the FAA's preferred alternative the landside development recommended in the FEIS and FSEIS by the POS's planning staff (alternative #3, North Unit Terminal), as adopted as Part of its Master Plan Update and ALP, and as partially approved for immediate construction by the POS at its' August 1, 1996, and May 27, 1997, meetings.

The FAA's approval of these landside expansion and improvement projects in this ROD signifies that these projects meet FAA standards for approval of the agency actions discussed in Section II of this ROD. It does not, however, signify an FAA commitment to provide a specific level of financial support for these projects, which must await future decisions to be made under the criteria prescribed by 49 U.S.C. § 47115(d), and under the agency policy announced in the Federal Register on June 24, 1997 (62 Fed. Reg. 34108), or under subsequent revisions to that agency policy.

V. THE AGENCY FINDINGS

The FAA makes the following determinations for this project, based upon the appropriate information and analysis set forth in the FEIS and FSEIS and upon other portions of the administrative record:

A. The project is consistent with existing plans of public agencies for development of the area surrounding the airport. [49 U.S.C. 47106(a)(1)].

The determination prescribed by this statutory provision is a precondition to agency approval of airport project funding applications. It has been long-standing policy of the FAA to rely heavily upon actions of metropolitan planning organizations (MPOs) in amending regional airport system plans (RASPs) to satisfy the project consistency requirement of 49 U.S.C. 47106(a)(1) [see, e.g., Suburban O'Hare Com'n v Dole, 787 F.2d 186, 199 (7th Cir, 1986)]. Furthermore, both the legislative history and consistent agency interpretations of this statutory provision make it clear that reasonable, rather than absolute consistency with these plans is all that is required.

Under the provisions of both Federal and State Law (see FEIS Appendix S, and FEIS Appendix R, response to comment R-2-1), the Puget Sound Regional Council (PSRC) has been designated as the MPO for the Puget Sound metropolitan area, and given primary responsibility for transportation planning in the region. On April 29, 1993, the PSRC adopted Resolution No. A-93-03 amending the Puget Sound area RASP, to provide for a third runway at Sea-Tac. That resolution stated that a third Sea-Tac runway shall be authorized by April 1, 1996, subject to the following three conditions:

1. Unless shown through an environmental assessment, which will include financial and market feasibility studies, that a supplemental site is feasible and can eliminate the need for the third runway. [By PSRC resolution EB-94-01, dated October 27,

1994, the PSRC determined that a supplemental airport site was not feasible].

2. After demand and system management programs are pursued and achieved or determined not to be feasible, based upon independent evaluation. [By final order dated December 8, 1995, the expert panel appointed by the PSRC to independently evaluate this issue, determined that that demand and system management programs were not feasible].

3. When noise reduction performance objectives are scheduled, pursued and achieved based on independent evaluation and based on measurement of real noise impacts. [By final order dated March 27, 1996, a PSRC expert panel found that the POS had not satisfied this condition. However, on July 11, 1996, in Resolution A-96-02, the PSRC General Assembly approved an amendment to the Metropolitan Transportation Plan to include a third runway at Sea-Tac Airport, with specific noise reduction measures based upon recommendations of the expert panel].

In consideration of the above-described actions of the PSRC in amending the local RASP to authorize the third runway project [more fully described at FSEIS pages 4-1 to 4-2], the FAA is satisfied that 49 U.S.C. 47106(a)(1) has been fully complied with.

With regards to this issue, however, the FAA has also reviewed the substantial documentation in the administrative record demonstrating that throughout the EIS process the POS has shown great concern for the impact of the proposed development actions on surrounding communities, and has attempted to ensure the consistency of its project proposals with the planning efforts of neighboring communities. The administrative record for this Record of Decision includes a detailed chronology of coordination between the POS and neighboring jurisdictions concerning local planning proposals, along with documents describing the extensive public meetings, hearings, and other means by which public participation in project planning was accommodated. Further discussion of consistency of the proposed development projects with public agency planning is summarized at FEIS pages IV.2-7 through IV-2-18, and at FSEIS Chapter 4.

As noted in the referenced text, Sea-Tac Airport lies almost totally within the boundaries of the City of SeaTac. The extent to which City of Sea-Tac regulations apply to Sea-Tac Airport development is unresolved, and the POS is currently involved in a process with the City to resolve this question. Meanwhile the POS has committed itself to participating in the City's land use planning activities, to address any issues relating to the proposed Sea-Tac Airport development to the extent required.

As discussed at FEIS IV.2-10 through IV.2-16, the cities of Des Moines, Normandy Park, Burien, and Tukwila have each engaged in recent land use planning actions which appear designed to limit airport expansion. These local plans and ordinances establish land use compatibility guidelines with noise levels for residential and other noise-sensitive areas that are substantially more restrictive than those established by the FAA. Some of these local plans and ordinances also establish zoning policies (a prohibition on use of lands acquired by public entities to be used for new commercial activities). These ordinances purport to restrict the use of some lands within these jurisdictions (e.g., for the third runway northern Runway Protection Zone), needed by the POS in order to implement important safety and aircraft operation aspects of its preferred alternative.

It has not yet been decided under Washington state law whether the Master Plan Update proposed development actions would be subject to any of these plans and ordinances adopted by these adjacent cities. Thus there may be little or no inconsistency here. With regard to noise planning, the FAA has considered the fact that implementation of the POS preferred alternative will not result, after mitigation, in any significant increases in noise impacts on lands of these neighboring jurisdictions. To the extent that these adjacent cities impose restrictions on land acquisition by the POS for essential aviation safety and aircraft operation purposes, the FAA believes that such planning policies are inapplicable and invalid under Federal law.

In making its determination under 49 U.S.C. 47106(a)(1), the FAA has considered the fact that each of these local governments has been represented on the PSRC, and has participated as a member of that organization in its decision to authorize the third runway project at Sea-Tac (although some of these local governments may have disagreed, as individual PSRC members, with that ultimate decision). The FAA has also recognized the fact that none of these jurisdictions has regulatory authority over airport operations, since long-established doctrines of Federal preemption preclude these communities from regulating aircraft operations conducted at Sea-Tac.

Furthermore, these local government planning policies, which appear designed to obstruct the proposed Sea-Tac development, appear to be in conflict with provisions of the Washington State Growth Management Act, 1990, such as those found at RCW §§ 36.70A.100 and 36.70A.200, which require these city comprehensive plans to be coordinated with and consistent with regional policy decisions (e.g., the 1995 update of the Vision 2020 Growth and Transportation Strategy. Vision 2020 is the region's long-range

growth management, economic, and transportation strategy. The transportation component of Vision 2020 specifically incorporates PSRC Resolution A-93-03 which authorizes the third runway project).

The Growth Management Act also requires these local plans to be coordinated with and to be consistent with King County countywide planning policies and the comprehensive plans of King County and neighboring cities such as Sea-Tac, and prohibits any local comprehensive plan from precluding the siting of essential public facilities such as airports.

Given the FAA determination in this ROD, under appropriate Federal law, that there is a compelling need for the proposed Sea-Tac improvements, as documented in the FEIS, it is inappropriate for these local communities to attempt to exercise local zoning control in a manner which would conflict with the domestic and international aviation requirements of this airport. If there were to be a conflict between Federal and local policies, the local policies must give way to the Federal policies, under the doctrine of Federal preemption.

B. The interests of the community in or near which the project may be located have been given fair consideration. [49 U.S.C. 47106(b)(2)]

The determination prescribed by this statutory provision is a precondition to agency approval of airport development project funding applications. The regional planning process over the past decade and the environmental process for this project-specific EIS which began in 1994 and extended to this point of decision, provided numerous opportunities for the expression of and response to issues put forward by communities in and near the project location. Nearby communities and their residents have had the opportunity to express their views during the Draft EIS public comment period, at several public hearings and a congressional hearing, as well as during the comment periods following public issuance of the FEIS, the DSEIS, and the FSEIS,. The FAA's consideration of these community views is set forth in FEIS Appendix R, in FSEIS Appendix F, and in Appendix A of this ROD.

C. The State of Washington has certified in writing that there is reasonable assurance that the project will be located, designed, constructed, and operated in compliance with applicable air and water quality standards [49 U.S.C.§ 47106 (c)(1)(B)].

The determination prescribed by this statutory provision is a precondition to agency approval of airport development project funding applications involving a major runway extension or new runway location.

By letter dated December 20, 1996 [see Appendix B to this ROD], the Washington State Department of Ecology, acting under delegated authority from the Governor of the State of Washington, provided this certification, conditioned upon a number of mitigation measures to be undertaken by the Port of Seattle. Pursuant to general principles of agency and administrative law, and absent evidence that delegation is unauthorized or unlawful as a matter of state law, the FAA has interpreted this statute to permit state chief executive officers to delegate this certification responsibility to lower state officials with appropriate subject matter jurisdiction over state air and water quality [see FAA Order 5050.4A, paragraph 47e.(5)(e)]. As described at FSEIS Appendix F, page F-79, the delegation to the Department of Ecology which occurred in this case was appropriate under Washington State law.

However given the public controversy which has arisen over this delegation, by letter dated June 30, 1997, (see Appendix C to this ROD], the Governor of the State of Washington further certified that the airport project evaluated in the FEIS and FSEIS will be located, designed, constructed and operated so as to comply with applicable air and water quality standards.

D. Effect On Natural Resources [49 U.S.C. § 47106(c)(1)(C)]

Under this statutory provision the FAA may approve funding of a new runway or runway extension having a significant adverse effect on natural resources, only after determining that no possible and prudent alternative to the project exists and that every reasonable step has been taken to minimize the adverse effect.

As documented in the FEIS and FSEIS, for several natural resource impact categories which have established significance levels, the agency finds that, without implementation of the mitigation summarized in Section VI and Appendix F of this ROD, the preferred alternative would have a significantly adverse affect. However, given the inability of other alternatives discussed in the FEIS and FSEIS, to satisfy the purposes and needs for the preferred alternative, we have concluded that no possible and prudent alternative exists to development of the proposed alternatives. As discussed in Section VI and Appendix F of this ROD, and documented throughout the FEIS, FSEIS and the administrative record, every reasonable step has been taken to

minimize adverse environmental effects resulting from the project.

As discussed generally in FSEIS Chapters 1 and 2, and more specifically at FSEIS Appendix F, response to comment 2-J, specific airport activity levels and their associated environmental impacts were determined not to be reasonably foreseeable at this time following the year 2010. Accordingly, that year was set as the end of the planning horizon for the revised master plan update proposal evaluated in the FSEIS. However, FSEIS Appendix D did present possible activity levels and their associated environmental impacts for three test cases through the year 2020, based upon an extrapolated quantification of anticipated impacts prior to the year 2010. Although that extrapolated presentation is quite speculative, for the reasons explained in FSEIS Appendix F, the FSEIS does acknowledge that after the year 2010 there will likely be some level of adverse noise and land use impacts resulting from the approval of the preferred development alternatives, when compared to the no action alternative after that date.

Accordingly, in order to consider further mitigation under NEPA, and to address any possible adverse environmental effects resulting from the projects approved in this ROD, the FAA has decided to condition such approval upon the following additional noise and land use mitigation measure:

Following commencement of operations on the new runway, but prior to the year 2010, the POS and the FAA will undertake a further supplemental evaluation of noise and land use impacts anticipated after the year 2010. That supplemental evaluation may be included as part of a future Part 150 study undertaken by the POS. Following completion of that evaluation, if significant additional adverse environmental impacts are found, the Port of Seattle will be required to adopt further noise and land use mitigation measures designed to minimize any significant adverse affects found in that evaluation. This conditional approval will be enforced through a special condition included in future Federal airport grants to the Port of Seattle.

The FAA has reviewed the amount of such additional mitigation which would be required if the maximum additional adverse environmental effects estimated in FSEIS Appendix D should occur. This additional mitigation required would be similar to mitigation programs that have been implemented by the POS in the past, and are expected to be implemented as mitigation in connection with the projects approved in this ROD. Therefore, the FAA concludes that such additional mitigation is feasible. The POS has indicted that such additional mitigation would be financially feasible if it were to be required, based on this

special condition. The FAA also concludes that even if the maximum additional adverse environmental effects estimated in Appendix D should occur, it would still make the decisions set forth in this ROD and would approve the projects, subject to the special condition with respect to additional mitigation.

E. Appropriate action, including the adoption of zoning laws, has been or will be taken to the extent reasonable to restrict the use of land next to or near the airport to uses that are compatible with normal airport operations. [49 U.S.C. § 47107(a)(10)].

The sponsor assurance prescribed by this statutory provision is a precondition to agency approval of airport development project funding applications. In addition to the actions described in section IV.A. of this ROD, the Port of Seattle has worked extensively with local jurisdictions over the past two decades to develop and implement plans and policies to ensure compatible land use in the airport vicinity.

FEIS pages III-2 through III-4 and FSEIS chapter four, describe the current status of zoning and land use planning for lands near the airport. FEIS Appendix C, pages 3-9 outline former and existing noise programs which have been designed to either reduce noise at the source or mitigate the noise received by sensitive land uses in the airport vicinity. As explained in FEIS Chapter IV, sections 1 and 2, and FSEIS Section 5-3, with planned mitigation, development of the Master Plan Update proposals will not result in any increased significant impacts on non-compatible land uses. Based upon the entire administrative record for this ROD, the FAA has concluded that existing and planned noise reduction programs at Sea-Tac provide for appropriate action to ensure compatible land use in the airport vicinity.

F. Clean Air Act, Section 176(c)(1) Conformity Determination regarding Seattle-Tacoma International Airport Master Plan Update Development Actions (42 U.S.C. § 7506(c).

The determination prescribed by this statutory provision is a precondition for Federal agency support or approval of airport development actions which are projected to exceed the *de minimis* air emission levels prescribed at 40 CFR § 93.153. USEPA regulations more generally governing the conformity determination process are found at 40 CFR Part 93, Subpart B.

In the 1996 FEIS, the FAA made a Draft Conformity Determination on the POS Master Plan Update proposals [FEIS pages IV.9-10 and IV.9-11]. Pursuant to the provisions of the USEPA regulations,

the FAA published notice of this draft conformity determination in the Federal Register on February 9, 1996 (61 Fed. Reg. 5055), announced the availability of the draft determination in several local newspapers, and provided notice to appropriate Federal, state and local public agencies. In these notices, the agencies and the general public were invited to review and comment on the draft conformity determination. Through a series of Federal Register notifications, the FAA ultimately extended this comment period until June 6, 1996 (61 Fed. Reg. 27944). Comments received during this 1996 comment period are presented at FSEIS Appendix B, Attachment D and are addressed at FSEIS Appendix B, Attachment A.

In February 1997, a Revised Draft Conformity Analysis was issued as part of the Draft SEIS, with a 30 day comment period announced in a February 9, 1997, Seattle Times advertisement. On March 7, 1997, the FAA announced an extension of the comment period on this draft analysis until March 31, 1997 [62 Fed. Reg. 10606]. FSEIS Appendix G presents all public and agency comments on the draft SEIS, including those pertaining to air quality issues. FSEIS Appendix F, section six, responds to those comments which concern air quality and conformity issues.

Due to a number of changes in the nature and timing of the Master Plan Update Development Proposals from those originally evaluated in the FEIS, the draft SEIS air quality analysis projected air quality emission levels below the 40 CFR § 93.153 *de minimis* levels.

Several commenters on the draft SEIS air quality and conformity analyses stated that factual errors had been made in those analyses. At the FAA's request, the EIS consultant then performed a detailed quality assurance reevaluation for the data input to the air emissions and dispersion models. This led to a revised air emissions inventory, with several revisions to the specific emission estimates presented in the draft SEIS. However, this quality assurance process confirmed the overall conclusion of the draft SEIS, which projected air quality emission levels below the *de minimis* levels set forth in 40 CFR § 93.153. FSEIS Appendix B details the basis for this conclusion. Accordingly, a formal conformity determination is not legally required under applicable EPA regulations.

ROD Appendix E presents letters dated June 23, 1997, from the United States Environmental Protection Agency, the State of Washington Department of Ecology, and the Puget Sound Air Pollution Control Agency. In their letters, each of these air quality agencies has concurred with the FSEIS analysis conclusion that the *de minimis* thresholds have not been exceeded for general conformity under the Clean Air Act.

However, in order to achieve maximum public disclosure and to address community concerns, the FSEIS nevertheless presents an analysis of air quality impacts utilizing the regulatory structure set forth in the EPA conformity regulations. The FSEIS Appendix B analysis demonstrates that if the FAA were legally obligated to make a conformity determination for the projects approved in this ROD, the project would not cause or contribute to any new exceedences of air quality standards. As confirmed by the Washington State Department of Ecology, the project conforms to the Washington State Implementation Plan.

As noted above, the Final SEIS, approved on May 13, 1997, included as Appendix B a Final Air Quality Conformity Analysis. At the request of several air quality agencies, the FAA agreed to provide an additional 30 day comment period on the FSEIS air quality analysis, due to the revisions which had been made to that analysis since issuance of the DSEIS. Notice of the availability of that analysis for public review and comment was published in the Federal Register on May 21, 1997 [62 Fed. Reg. 27830]. Appendix E to this ROD presents the comments received in response to this notice and the agency's response to those comments.

Based upon the air quality information and discussion presented in the FEIS, the FSEIS, and Appendix E of this ROD, and upon other supporting material in the administrative record, the FAA finds that the development actions summarized in ROD Appendix B will not cause air emissions that exceed de minimis thresholds set forth in 40 CFR § 93.153, and conform to the provisions of the Washington State Implementation Plan and the National Ambient Air Quality Standards (AAQS).

Because projects at Sea-Tac Airport are governed by the maintenance area designation, the FSEIS shows that the project will not cause or contribute to any new violations of any of the AAQS in the project area or the metropolitan area. Because the computer modeling predicts that exceedances of the Carbon Monoxide AAQS could occur in the future without the proposed improvements (Do-Nothing/No-Build), consideration was also given to the two non-attainment area principles, and the FSEIS showed that the project will not increase the frequency or severity of any existing violations of any AAQS, and that the project will not delay timely attainment of the AAQS or any required interim emission reduction in the project area.

G. For this project, involving new construction which will directly affect wetlands, there is no practicable alternative to such construction. The proposed action includes all practicable measures to minimize harm to wetlands which may result from such use. [Executive Order 11990, as amended]

This executive order requires all Federal agencies to avoid providing assistance for new construction located in wetlands unless there is no practicable alternative to such construction and all practicable measures to minimize harm to wetlands are included in the action.

FEIS Chapter IV Section 11, and FSEIS Section 5-5 document that the preferred development alternative (North Terminal with 8500 foot runway) selected by the POS from the Master Plan Update study will directly affect approximately 12.23 acres of wetlands. Given the extensive FEIS and FSEIS alternatives analyses (summarized at FEIS IV.11-5 and FSEIS Chapter 3) showing that there are no other reasonable alternative to developing a third runway at Sea-Tac, the FAA additionally concludes that there is no practicable alternative to constructing such a runway, resulting in these wetland impacts, given the purposes and needs documented in the FEIS, consideration of environmental and economic factors, and land use issues.

FEIS Chapter IV, Section 11 and FSEIS Section 5-5, state that for each of the three landside development alternatives, an 8,500 foot runway would result in impacts to slightly more wetlands than would 7,000 foot or 7,500 foot runways. Additional runway length beyond 7,500 feet would require filling additional wetlands. Extending the runway to 8,100 feet requires filling 0.19 additional acres of wetlands, and extension to the full 8,500 feet requires filling a yet additional 0.86 acres. The FEIS and FSEIS demonstrate that these are low quality wetlands. Two of their significant functions, floodwater attenuation and floodwater storage, would be fully mitigated within the airport basin. Additional wetland functions for these wetlands will be mitigated at the Auburn site as part of the overall wetlands mitigation program.

An important purpose of the additional 600 and 400 feet of runway (to 8,100 or 8,500 feet) beyond the 7,500 foot runway is to provide the maximum air transportation service and efficiency available to the POS and the national air transportation system. Although a 7,500 foot runway provides many of the benefits of a new runway, it does not provide all of the desirable benefits. Alternatives of staggering runway ends or relocating the entire runway are not practicable, because, among other reasons, they would require considerable additional cost and complicate air traffic control procedures. Considering these and other reasons

described more fully in Appendix C of this ROD, considering the standards set forth at 40 CFR 230.10(a)(2), and taking into consideration cost, existing air traffic control and aviation technology and logistics, in light of the overall purpose of the runway project, the FAA finds that there is no practicable alternative to the wetland loss associated with an 8500 foot runway.

As noted in FEIS Chapter IV, Section 11, FEIS Appendix P, and FSEIS Section 5-5, the U.S. Army Corps of Engineers (COE) has worked with the FAA and the POS as a cooperating agency to ensure that all practicable measures will be taken to minimize harm to wetlands which will be impacted through development of the preferred alternative, through Best Management Practices during construction and the development of a wetland compensatory mitigation site. Following issuance of this ROD , the COE, in consultation with the Washington State Department of Ecology, will complete its processing of a Section 404 permit, required for the POS to proceed with development impacting wetlands. The project approvals in this ROD and this wetlands determination are expressly conditioned upon permit approval and conditions to be outlined by the U.S. Army Corps of Engineers, and upon the POS accomplishing the wetlands mitigation measures identified in the FEIS, FSEIS, and any COE permit approval.

Although it is generally preferable to attempt to mitigate wetland loss through replacement wetlands in the same watershed [a goal reflected in the local regulations discussed at FSEIS Appendix F, page 127], this is not the case where such replacement would create man-made wetlands adjacent to airport aircraft movement areas. Included at the end of FSEIS Section 5-5 is a reprint of FAA Advisory Circular 150/5200-33, dated May 1, 1997, which states the FAA's strong opposition to wetland mitigation projects located within 10,000 feet of airports serving turbine-powered aircraft [such as SEA-TAC], due to the safety hazard such wetlands present as attractants of wildlife, which significantly increase the risk of bird/aircraft strikes.

The safety standards set forth in this FAA policy statement are recommended for the operators of all public-use airports. Furthermore, for airport sponsors who are the recipients of Federal grant funding, adherence to safety standards set forth in FAA advisory circulars are a requirement of standard grant assurance #34, as acknowledged in paragraph 4-6.a. of Advisory Circular 150/5200-33.

This recent agency policy determination supports the FEIS and FSEIS determinations that the replacement wetlands for the Sea-Tac Master Plan Update development actions should not be located in the vicinity of the airport. Given the limited land area in

the Sea-Tac watershed available for wetland replacement, and the hazard associated with the creation of wildlife attractions within 10,000 feet of jet runways, there is no practicable alternative to the replacement of these impacted wetlands outside of the Sea-Tac watershed.

As detailed in FEIS Appendix P, and FSEIS Section 5-5, a detailed wetland mitigation program has been developed to offset the impacts of the project and to recognize other long-term biological problems. The mitigation plan calls for replacing the filled wetlands on a 47 acre mitigation site located on a 69 acre parcel of land along the Green River in Auburn Washington.

H. For this project, involving a significant encroachment on a floodplain, there is no practicable alternative to the selected development of the preferred alternative. The proposed action conforms to all applicable state and/or local floodplain protection standards. (Executive Order 11988)

This executive order, together with applicable DOT and FAA orders, establish a policy to avoid supporting construction within a 100 year floodplain where practicable, and where avoidance is not practicable, to ensure that the construction design minimizes potential harm to or within the floodplain.

Chapter IV Section 12 of the FEIS explains that, without mitigation, construction and operation of the Master Plan Update preferred alternative could result in significant adverse floodplain impacts in both the Miller and Des Moines Creek basins. The FSEIS analysis does not alter the FEIS analysis, but presents additional information at FSEIS Appendix F, pages 123-124, based on a 1997 POS Stormwater Review Study.

As outlined in the "alternatives" discussion earlier in this ROD and in the FEIS and FSEIS, there is no practicable alternative to the preferred alternative. Development of this alternative achieves the purposes and needs for the projects in the most cost-effective manner with the least impact on the surrounding land uses. As shown in FEIS Appendix P, a mitigation program has been designed which will create an equivalent amount of floodplain so that there would be no net loss of flood storage capacity or increased risk of loss of human life or property damage. This program has been designed to comply with applicable requirements of the permitting agencies, with whom the FAA and the POS have been coordinating in order to ensure that the construction design minimizes potential harm to or within the floodplain. Each of these agencies have agreed with the mitigation plan in concept and the coordination will continue throughout the permitting process.

I. Relocation Assistance (42 U.S.C. § 4601 *et. seq.)*

These statutory provisions, imposed by Title II of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (URA), require that state or local agencies undertaking Federally-assisted projects which cause the involuntarily displacement of persons or businesses, must make available relocation benefits to those persons impacted.

As detailed in FEIS Chapter IV, Sections 6 and 8, the preferred development alternative would displace up to 391 single family, 260 condos/apartments, and 105 businesses. Of the 105 businesses identified by the FEIS, 88 are located in the Runway Protection Area. While the FAA prefers airport sponsors to have control over the land in the RPZ, exceptions to property ownership can occur as long as the use of the land does not represent a hazard to aircraft operation. The Port has surveyed these property owners and their use.

The FAA will continue to coordinate with the POS concerning the need for acquisition versus the purchase of easements to ensure the appropriate land use control. The FAA will require the POS to provide fair and reasonable relocation payments and assistance payments pursuant to the provisions of the URA. Comparable decent, safe, and sanitary dwellings are available for occupancy on the open market. (See FEIS, pages IV.6-5 to IV.6-7).

J. For any constructive use of lands with significant historic sites, there is no prudent and prudent and feasible alternative to using the land, and the project includes all possible planning to minimize harm resulting from the use. [49 U.S.C. § 303(c)]

FEIS Chapter IV, Section 4, concluded that the Master Plan Update development actions would not involve either the use or constructive use of resources protected by this statutory provision, more commonly referred to as "4(f)" resources.

However the FSEIS, at Section 5-5, pages 8-19, shows that when comparing the no action and the preferred alternative using the updated airport activity forecasts, several structures (one school and three homes) which may be of local historical significance, will experience noise impacts which exceed the Federal standard (a 1.5 DNL increase within the 65 DNL contour).

As discussed at FSEIS Section 5-5, pages 13-14, the FAA questions whether most of these structures are truly of historical significance, despite their designation as such by communities

surrounding the airport. The FAA also questions whether these structures will be "constructively used" under the circumstances discussed in the referenced FSEIS text, because there will be no significant degradation of the noise environment of these structures since the time when they were designated as locally significant, and thus there will likely be no significant degradation of their historic or architectural values.

Nevertheless, assuming such "local historical significance" and such a "constructive use", the referenced FSEIS text demonstrates that there is no prudent or feasible alternative to any such constructive use. Furthermore, based upon the acoustical insulation planned for these structures by the POS (discussed at FSEIS Section 6-6, pages 17-19), the FAA concludes that there has been all possible planning to minimize any harm resulting from any such constructive use.

K. There are no disproportionately high and adverse human health or environmental effects from the project on minority or low-income populations. [Executive Order 12898]

Environmental justice concerns were addressed in Chapter IV.6, page IV.6-6 and IV.6-7 of the FEIS, and it was concluded that no minority, age or income group would be disproportionately affected by displacements that would occur as a result of the Preferred Alternative. Individual comments regarding environmental justice were also addressed on page R-102 of FEIS Appendix R. The FSEIS contained an extensive discussion of environmental justice issues on page F-98 through F-101 in response to comments on this issue. It was concluded that the proposed noise exposure impacts from the Proposed Master Plan Update improvements will not disproportionately affect minority and low-income communities and that the impacts of the higher demand forecasts were not different than those discussed in the FEIS.

L. The FAA has given this proposal the independent and objective evaluation required by the Council on Environmental Quality. [40 CFR 1506.5]

As outlined in the FEIS, there was a lengthy process that led to the ultimate identification of the preferred alternative and appropriate mitigation measures. This process began through the FAA competitive selection of an independent EIS contractor which was financially-disinterested in the project outcome, and continued throughout the NEPA process. The FAA provided input, advice, and expertise throughout the planning and technical analysis, along with an administrative and legal review of the

project. From its inception, the FAA has taken a strong leadership role in the environmental evaluation of this project, and has maintained its objectivity.

VI. MITIGATION

In accordance with 40 CFR 1505.3, the FAA will take appropriate steps, through Federal funding grant assurances and conditions, airport layout plan approvals, and contract plans and specifications, to ensure that the following mitigation actions are implemented during project development, and will monitor the implementation of these mitigation actions as necessary to assure that representations made in the FEIS and FSEIS with respect to mitigation are carried out. The approvals contained in this Record of Decision are specifically conditioned upon full implementation of these mitigation measures. These mitigation actions will be made the subject of a special condition included in future Federal airport grants to the POS.

FEIS Chapter V, and Appendix F to this ROD include summaries of the mitigation actions discussed more fully in FEIS Chapter IV and FSEIS Chapter 5, for each environmental impact category. Based upon these discussions, the FAA finds that all practical means to avoid or minimize environmental harm have been adopted, through appropriate mitigation planning. Mitigation measures for those impact categories where mitigation measures are necessary to avoid or minimize significant environmental impacts, as well as identified or adopted monitoring and enforcement programs, are summarized below:

A. Noise and Land Use

As discussed in FEIS Chapter IV, Sections 1 and 2, and FSEIS Chapter 5, Sections 3 and 6, future noise impacts within the study area will be less than current noise exposure due to the continued phase-out of Stage II (noisier) aircraft. However in the future the preferred alternative is expected to still result in greater significant [1.5 DNL within the 65 DNL contour] noise exposure in comparison to the future do-nothing alternative. [See FSEIS Exhibit 5-6-1 for a graphic comparison of noise exposure for no action alternative and the preferred alternative in the year 2010].

To facilitate continued noise reduction, the following noise and land use mitigation programs now in effect will continue to be implemented.

- Noise Budget – The goal of the Noise Budget of an all Stage 3 fleet is anticipated to be reached by the year 2001.
- Nighttime Limitations Program – limiting the hours of operation for Stage 2 aircraft.
- Ground Noise Control – reducing the noise of ground events such as powerback operations, run-ups, and reverse thrust on landing.
- Flight Corridorization – maintenance of north flow east turn runway heading flight track by departing jets until reaching altitudes above 4,000 feet.
- Flight Track and Noise Monitoring – maintenance of noise level records and flight track location information for identification of deviations and communication with the public and users.

The FEIS concluded that since relatively few properties were projected to experience significant impacts, and since they already fall within the boundaries of one or more of the POS's existing noise remedy programs designed to mitigate to non-significance airport noise levels, no additional project-related mitigation would be needed, as described at FEIS page IV.2-6,7.

However, the updated airport activity forecasts evaluated in the FSEIS resulted in an increase of noise exposure of approximately 7.69 square miles, and 11 percent more persons [approximately 1,280 persons, in an additional 460 dwelling units) being significantly affected by the preferred alternative in contrast to the do-nothing alternative, by the year 2010.

Furthermore, by the year 2010, a small portion of this area [with approximately 170 newly impacted residents], would be located outside of the POS existing noise remedy boundary [This is graphically shown in FSEIS exhibit 5-6-1]. The POS will be required to modify its mitigation strategy, as described at FSEIS pages 5-6-5 to 5-6-7, and in the following paragraph #4, to include these 170 newly-impacted residents within in its Noise Remedy Program.

To address changes in specific noise conditions, primarily associated with the third parallel runway, the Port will be required to undertake the following specific mitigation actions:

1. Mitigating Significant Noise Impacts on Public Facilities and Historic Sites: The following nine public facilities or historic sites would experience significant increased noise impacts (i.e. an increase of 1.5 DNL or more) in the year 2010 in comparison to the Do-Nothing alternative:

   - Sea-Tac Occupational Skills Center;
   - Woodside Elementary School;
   - Sunnydale Elementary;

- Albert Paul House;
- Homer Crosby House;
- Sunny Terrace Elementary School;
- Brunelle Residence;
- Coil House;
- Bryan House.

Impacts on the facilities incompatible with noise associated "With Project" will be mitigated by acoustical insulation that would allow their uses to be compatible with increased noise levels. Because of their historic value, the five residences and Sunnydale School (locally significant historic facilities) could require custom treatment to avoid significant alteration of the architectural style. In pursuing sound insulation of these structures, the Port's Noise Remedy Office will work with a historian to preserve such characteristics.

2. Provide Directional Soundproofing: Residences that were insulated prior to 1992 may need additional directional soundproofing to mitigate noise generated from a new flight path from the operation of the proposed new third runway. To mitigate noise caused by the proposed airport improvements, the Port will conduct audits and sound insulate these facilities if additional insulation is warranted.

3. Acquisition in the Approach Transitional Area: In recognition of the fact that the standard Runway Protection Zone (RPZ) dimensions do not always provide sufficient buffer to the satisfaction of nearby residents, the FAA has indicated that funding could be available to airport operators acquiring up to 1,250 feet laterally from the runway centerline, and extending 5,000 feet beyond each end of the primary surface. Based on the configuration of current airport land, local streets, and residential development patterns, the approach and transitional area selected for use as a mitigation area includes the standard Runway Protection Zone and a rectangular extension of the RPZ outward another 2,500 feet.

Acquisition would include all residential uses, and any vacant, residentially zoned properties which cannot be compatibly zoned, within selected areas both to the north and the south of the new runway ends. Commercial land uses, which make up most of the eligible area to the south, will not be acquired. Input from the affected residents is necessary to design and initiate an acceptable relocation program. The Port will develop the appropriate implementation program for this action during the forthcoming Sea-Tac Airport FAR Part 150 Update, which the Port anticipates undertaking during 1997. The implementation plan will include coordination with eligible residents concerning

their desire to participate and then establish relocation objectives, timing and funding priorities.

Sound insulation of residences affected by 1.5 DNL or greater within 65 DNL noise exposure: About 170 of these homes within 65 DNL would be exposed to 1.5 DNL or higher noise levels as a result of the proposed improvements and are not already subject to the Port's existing Noise Remedy Program. The Port will develop an implementation strategy to sound insulate these 170 additional homes within the 65 DNL noise contours as part of the Part 150 Noise Compatibility Plan study effort. The purpose of delegating finalization of the implementation approach for this action to determination during the Part 150 process is to ensure that consideration is given to the proposed Approach Transition Area acquisition and the relationship of that area to the existing Noise Remedy Program boundary, as well as the westerly expansion of the Noise Remedy Program to accommodate this added insulation.

In Port Resolution No. 3125 dated November 1992, the POS committed to develop and implement a plan to insulate up to 5,000 eligible single family residences in the existing noise remedy program included on the waiting list as of December 31, 1993, before commencing construction of the proposed runway. The remaining eligible single family residences on the waiting list are to be insulated prior to operation of the proposed runway. In addition, the Port has committed to complete insulation of all single-family residences that become eligible for insulation as a result of actions taken based on the site-specific EIS and are on the waiting list as of December 31, 1997, prior to commencing operations of said runway.

Pursuant to PSRC Resolution A-96-02, the POS will be required to conduct a Part 150 study with the goal of assessing needed additional noise abatement and mitigation. This study began late in 1996, and is expected to take several years.

The FAA will consider as required mitigation a standard insulation package for homes that fall both inside and outside the 65 DNL project contours, which are within the POS noise remedy program boundaries, since this was the intent of the PSRC in conditioning its regional approval of the 3rd runway upon the accomplishment of additional noise mitigation measures.

The FAA will continue to support and monitor the POS's existing and future noise programs, in order to ensure that any anticipated significant project noise and land use impacts are fully mitigated by the time the third runway becomes operational.

Finally, for significant project noise impacts which might occur after the year 2010, the FAA will also require a supplemental environmental evaluation and appropriate mitigation, as described in Section V.D. of this ROD.

B. Archaeological, Cultural and Historical Resources

FEIS Chapter IV, Section 3, finds that no known significant archaeological or cultural sites would by physically impaired as a result of the preferred alternative, and that mitigation is therefore not anticipated to be necessary. The FSEIS [Chapter 5, Section 5-6] does not alter that conclusion. ROD Section V.J. addresses the issue of mitigating any noise-based "constructive use" of these resources.

Both the FEIS and the FSEIS state that in the event artifacts are discovered during construction activities, construction in the area will be halted immediately in order to record the finding, determine its level of significance, and develop appropriate mitigation measures.

As noted in FSEIS Section 5-6, the Sunnydale Elementary School could receive significant increased noise in the future when a comparison is made between noise associated "with project" versus noise associated with the "do nothing" alternative. Because of this noise increase, the agency, through its EIS consultant team, initiated consultation with the Washington Department of Community, Trade and Economic Development, Office of Archeology and Historic Preservation (the State Historic Preservation Officer, or SHPO).

At the time that the FEIS was published in February 1996, a significant change in noise impact to this school associated with the project was not anticipated. However, since that time, through preparation and publication of the FSEIS, the data suggests that noise impacts associated with the higher forecast operations might result in a significant noise impact to this school. The following summarizes the noise impact at Sunnydale Elementary School:

	Do-Nothing	With-Project
Existing	65.8	NA
Year 2000	61.6	61.6
Year 2005	61.7	63.7
Year 2010	62.3	65.1

As is shown in the above noise exposure data, "with-project" will be less than existing or past noise exposure. During earlier

years, this school was exposed to even greater noise exposure. The 1984-1985 noise contour indicates that this school was exposed to between 70-75 DNL sound levels during that period (Sea-Tac International Airport Part 150 Study Noise Compatibility Planning, dated February 1985, Exhibit 3-5).

While this site is not currently listed on the National Register of Historic Places, during consultation on the 1996 FEIS, the SHPO indicated that it could be eligible. Because of the change in impacts, a follow-up request concerning eligibility was made of the SHPO. On February 10, 1997, the SHPO stated "It is my opinion that the Sunnydale School is eligible for National Register listing. Information provided indicates that the school has played a significant role in the development of the Burien area, and retains character defining features conveying its historic function as a school". As suggested by the SHPO, a April 14, 1997, letter was forwarded to the Advisory Council on Historic Preservation (ACHP) for the purpose of determining if the ACHP wished to participate in the development of a Memorandum of Agreement to address mitigation.

Because the school is currently affected by noise above 65 DNL, and could continue to be affected in the future, the POS has proposed to sound insulate this school. Recognizing it's historic context, the FSEIS notes that "Because of their historic value, these facilities [*several homes which the SHPO has since determined not eligible for inclusion on the National Register, and Sunnydale school*] could require custom treatment to avoid significant alteration of the architectural style. In pursuing sound insulation of these structures, the Port's Noise Remedy Office will work with a historian to preserve such characteristics" [*emphasis added*]. The City of Burien Public Hearing Draft Proposed Comprehensive Plan dated April 1997 (page II-96) states "Cedarhurst and Sunnnydale elementary schools will be remodeled to increase capacity to 650 students by the year 2002". The current capacity of Sunnydale is 525 students. Thus, the sound insulation could be done as part of the scheduled remodel and can be conducted to ensure compatibility of the structure relative to its continued use as an educational facility.

On April 14, 1997, at the request of the SHPO, the FAA's EIS historic consultant sent a letter to Ms. Claudia Nissley of the ACHP Western Office of Project Review summarizing this situation and stating: "In response to a request from the SHPO, we are asking if the Advisory Council would like to be involved in the MOA...If I do not hear from you within (30) days after your receipt of this letter, I will assume that you do not wish to participate in the MOA". This letter was addressed to the ACHP Western Office address of record and was not returned to the

sender. However, as a courtesy, the consultant contacted the ACHP Western Office in June 1977 to follow up on the letter. As part of this contact, the ACHP verbally indicated that it had not received the letter, but that it would refer the issue to the Washington DC office of ACHP. No response has been received from either the ACHP Western Office or the ACHP Washington DC office as of the date of approval of this ROD.

For the reasons discussed in FEIS section 5-6, the FAA questions whether the consultation procedures under the National Historic Preservation Act apply to the Sunnydale School. Nevertheless, the FAA has attempted to consult with the appropriate agencies. As is noted in the Final Supplemental EIS, relative to the National Historic Preservation Act, this school is the only property arguably affected. The FAA is approving the Master Plan Update project at this time having considered the following:

- The noise impacts that would be experienced at this school would be less than the current noise exposure;
- The noise exposure has not altered the use of this site as a school and is not related to its historic significance;
- Appropriate mitigation has been proposed and will be required by the FAA to address any significant aircraft noise exposure impacts;
- In light of the failure of the ACHP to respond to correspondence concerning this project, the FAA and the POS have initiated additional consultation with the SHPO concerning the development of a Memorandum of Agreement to address sound insulation mitigation.

Consultations have occurred with the SHPO and have been attempted with the ACHP as part of the FAA's comprehensive efforts to involve all appropriate commenters and as a courtesy, the FAA and the POS will continue to work with the appropriate agencies. In reaching its conclusions relative to the National Historic Preservation Act, the FAA's findings are supported by the FSEIS and ROD evaluation performed relative to DOT Section 4(f).

C. Social and Induced Socio-Economic Impacts

As detailed in FEIS Chapter IV, Section 6, the preferred development alternatives would displace up to 391 single family, 260 condos/apartments, and 105 businesses. Of the 105 businesses identified by the FEIS, 88 are located in the Runway Protection Area. While the FAA prefers airport sponsors to have control the land in the RPZ, exceptions to property ownership can occur as long as the use of the land does not represent a hazard to aircraft operation. The Port has surveyed these property owners and their use and will continue to coordinate with the FAA

concerning the need for acquisition versus the purchase of easements to ensure the appropriate land use control. Given the anticipated displacement and relocation of people, the FAA will require the POS to provide fair and reasonable relocation payments and assistance payments pursuant to applicable provisions of 42 U.S.C. § 4601 *et. seq.* and implementing regulations.

D. Air Quality

As noted in ROD section V.C., the Governor of the State of Washington has certified to the FAA after reviewing the FEIS and FSEIS that the project will be located, designed, constructed, and operated in compliance with applicable air quality standards.

In Section V.F. of this ROD air quality conformity under 42 U.S.C. § 7506(c) is discussed, and it is concluded that the project will, although not exceeding the *de* minimis thresholds for general conformity, nevertheless conforms to the Washington State Air Quality Implementation Plan and the National Ambient Air Quality Standards. With no significant air quality impacts, no air quality mitigation is necessary.

FEIS Chapter IV, section 9 and its supporting Appendix D, had included a worst-case intersection "hot spot" analysis of the preferred alternative, which predicted slight potential exceedences of air quality standards for carbon monoxide at two key intersections at the northeast side of the airport, as the year 2010 approached. The FEIS had contemplated future air monitoring and evaluation in order to determine whether specific mitigation of these exceedences would be required.

However, as explained at FSEIS page 5-2-10, project planning of the surface transportation features for those two intersections has since been modified so as to eliminate these modeled potential exceedences, thus avoiding the necessity for future mitigation of this nature. Specifically, the POS will accomplish the following:

- At the time that the North Unit Terminal is undertaken, the Port will develop additional southbound right turn and northbound left turn capability at the intersection of S. 170th Street at International Blvd., unless shown by then current conditions that these improvements are no longer necessary; and
- At the time that the North Employee Parking Lot is undertaken, the Port will develop additional intersection turning capability at the intersection of South 154th Street at 24th Avenue S.

- To ensure that construction emissions do not exceed the air conformity de-minimis levels, the Port will ensure that annual construction-related truck haul does not exceed 280,700 two-way trips by Heavy Duty Diesel Vehicles.
- To minimize construction related particulate emissions, the Port will implement construction Best Management Practices (BMPs) as noted in Table 5-4-8 in the Final Supplemental EIS.

E. Water Quality

As noted in ROD section V.C., the Governor of the State of Washington has certified to the FAA after reviewing the FEIS and FSEIS that the project will be located, designed, constructed, and operated in compliance with applicable water quality standards. Furthermore, the approvals in this ROD are expressly conditioned upon the POS accomplishing the water quality mitigation measures identified in the FEIS and FSEIS.

With implementation of the preferred alternative developments, there would be widespread surface area disturbance throughout the study area, which has the potential to significantly affect area hydrology. Absent mitigation, the extensive earthmoving required during project construction has the potential to significantly impact the flow rates and water quality of soil infiltration, surface runoff, and stream flow.

FEIS pages IV.10-16 through IV.10-20 provide an extensive set of mitigation measures designed to avoid or minimize these hydrological impacts. These include a set of stormwater management measures based upon Department of Ecology standards, BMPs (best management practices) required by applicable Federal, state and local laws, policies and design standards, as well as other requirements set forth in existing and additional NPDES permits to be required of the POS.

Specifically, the POS will be required to implement the following water quality and hydrology mitigation:

a. Construction Erosion and Sedimentation Control Plan. Prepare a construction erosion and sedimentation control plan for the construction of the new runway. The plan shall require use of Best Management Practices (BMPs) including but not limited to the following:

   - Erosion control measures such as use of mulching, silt fencing, sediment basins, and check dams that are properly applied, installed, and maintained pursuant to agreements with contractors.

- Spill containment areas to capture and contain spills at construction sites and prevent their entry into surface or ground waters. Install proper temporary fuel storage areas and maintenance areas to reduce the potential for spills and contamination.
- Phasing of construction activities to minimize the amount of area that is disturbed and exposed at any one time.
- Where feasible, use of temporary and permanent terraces for fillslopes and cutslopes to reduce sheet and rill erosion and reduce transport of eroded materials from the construction site.
- Install gravel and wheel wash facilities on construction equipment access roads and encourage covering of loads to minimize sediment transport onto nearby roads.

b. Stormwater Management Plan. Prepare a stormwater management plan for the new runway that includes the following:

- Detention criteria should be based upon Department of Ecology standards limiting 2-year peak flow rates from the developed portions of the site to 50% of the existing 2-year rate, limiting the developed 10-year rate to the existing 10-year rate, and limiting the developed 100-year flow rate to the existing 100-year rate.
- Design stormwater facility outlets to reduce channel scouring, sedimentation and erosion, and improve water quality. Where possible, flow dispersion and outlets compatible with stream mitigation will be incorporated into engineering designs.
- Maintain existing and proposed new stormwater facilities. Stormwater management facilities will be maintained according to procedures specified in the operations manuals of the facilities.

C. NPDES Permit Requirements. Comply with the requirements of the National Pollution Discharge Elimination System permit for the airport dated June 30, 1994, as may be revised from time to time.

FSEIS pages 5-7-4 through 5-7-6 discuss additional mitigation measures relating to groundwater concerns of the Seattle Water Department. Additional related mitigation measures are set forth in a June 20, 1997, agreement between the POS and The City of Seattle Public Utilities Department, pertaining to the proposed North Employee Parking Lot at SEATAC. That agreement is incorporated by reference in this ROD.

F. Wetlands

FEIS Chapter IV, Section 11, documents that the preferred development alternative (North Terminal with 8500 foot runway) will directly affect approximately 10.37 acres of wetlands. FSEIS Section 5-5 modifies this figure to approximately 12.23 acres of wetlands. As noted in FEIS Chapter IV, Section 11, FEIS Appendix P, and FSEIS Chapter 5, section 5-5, the U.S. Army Corps of Engineers (COE) has worked with the FAA and the POS as a cooperating agency to develop a wetland compensatory mitigation site. The mitigation plan calls for replacing the filled wetlands on a 47 acre mitigation site located on a 69 acre parcel of land along the Green River in Auburn Washington. As explained in this ROD at Section V.G., this off-site, out-of-watershed mitigation is consistent with FAA policy, and will be required as a condition of FAA grant assurances associated with Federal funding of the Master Plan Update development projects.

In December 1996, the Port submitted an application to the Army Corps of Engineers for a permit to fill wetlands at Sea-Tac Airport associated with the Master Plan Update improvements in compliance with the Clean Water Act, Section 404. The 404 permit application submitted to the Corps of Engineers includes a completed Joint Aquatic Resources Project Application (JARPA) form, in a report entitled "JARPA Application for Proposed Improvements at Seattle-Tacoma International Airport" dated December 1996. Upon issuance of this ROD, the COE, in consultation with the Washington State Department of Ecology, will complete its processing of a COE Section 404 permit, required for the POS to proceed with development impacting wetlands.

G. Floodplains

Chapter IV Section 12 of the FEIS explains that, without mitigation, construction and operation of the Master Plan Update preferred alternative could result in significant adverse floodplain impacts in both the Miller and Des Moines Creek basins. As shown in FEIS Appendix P, a mitigation program has been designed which will create an equivalent amount of floodplain so that there would be no net loss of flood storage capacity or increased risk of loss of human life or property damage. This program has been designed to comply with applicable requirements of the permitting agencies, with whom the FAA and the POS have been coordinating in order to ensure that the construction design minimizes potential harm to or within the floodplain. Each of these agencies have agreed with the mitigation plan in concept and the coordination will continue throughout the permitting process. The FSEIS does not alter the conclusions or mitigation approach discussed in the FEIS.

H. Surface Transportation

FEIS Chapter IV, Section 15, presented the results of both an initial analysis and a refined analysis of level of service volumes for the preferred alternative, at relevant intersections and freeway ramp junctions in the airport vicinity. The initial analysis indicated a slight and nonsignificant degradation of level of service at only one intersection, not requiring any mitigation.

The FEIS refined analysis of the preferred alternative included two scenarios, one assuming the construction of a SR 509 extension, and one assuming no such extension. This refined analysis showed adverse impacts (defined as a significant degradation in level of service when compared with the do-nothing alternative) at a number of intersections and at one freeway ramp junction, with and without SR 509, requiring a variety of intersection and ramp junction improvements as mitigation.

However, the revised surface transportation analyses presented in the FSEIS reflected changes in the design and timing of the surface transportation components of the Master Plan Update development actions. The FSEIS analysis concluded that no significant adverse changes in Levels of Service would result from the preferred alternative for any of the evaluated intersections and freeway ramp junctions in the airport vicinity during the project planning period. Accordingly, no surface transportation project-related mitigation is required.

I. Plants and Animals

FEIS Chapter IV Section 16 discusses the impacts of the preferred alternative upon vegetation and wildlife communities. Absent mitigation, the greatest project-related impacts to these resources would result from the degradation of area hydrology, water quality, aquatic habitat and biota of Miller and Des Moines Creeks, due to the realignment and relocation of portions of these waterways.

FEIS pages IV.16-11 through IV.16-15 and FEIS Appendix P discuss these anticipated impacts and planned measures to mitigate these biological impacts. These mitigation measures include a wetlands replacement plan, creek relocation and habitat improvement plans, a stormwater pollution prevention plan, and a spill prevention control and countermeasures plan. These plans are subject to approval of a number of other Federal, state and local agencies, as conditions to issuance of required permits.

The FSEIS presents no additional information which would alter the FEIS conclusions with regard to this mitigation.

J. Services/Utilities

FEIS Chapter IV Section 18 discusses the impacts of the preferred alternative upon public services and utilities serving the immediate airport vicinity. The greatest project-related impacts to these resources would result from relocation or abandonment of fresh water, sanitary sewer, electrical power and telephone pipes and lines which transverse the project area. FEIS page IV.18-7 discusses the required mitigation, which includes POS assuming the cost of these relocations and abandonments. The FSEIS presents no additional information which would alter the FEIS conclusions with regard to this mitigation.

K. Earth

FEIS Chapter IV Section 19 discusses the impacts of the preferred alternative upon the geology, soils and hazard areas in the immediate airport vicinity. The greatest project-related impacts to these resources would result from the extensive clearing, grading, excavation, and fill placement required throughout the project area. FEIS page IV.18-7 discusses mitigation measures, which include the design and implementation of an erosion and sedimentation control plan subject to approval by state and local authorities, and a landscaping plan. The FSEIS presents no additional information which would alter the FEIS conclusions with regard to this mitigation. Specifically, the POS will implement the following earth-related mitigation:

- The FEIS identifies two seismic hazard areas on the site of the new runway, referred to as "relatively small areas of loose shallow sediment". The Port will remove the sediment and replace it with compacted fill, or other appropriate engineering approach to stabilizing these areas, should be included in the final engineering plans.

- Prepare a landscaping plan for the new runway area, including plans for seeding and planting of vegetation to stabilize areas of fill that will not be covered by impervious surface.

L. Hazardous Substances

FEIS Chapter IV Section 21 discusses the impacts of the preferred alternative associated with hazardous substances. Concerns in

this area include the exposure of contaminated soils during excavation activities, release of hazardous substances during underground storage tank removal and building demolition activities associated with facility relocations, and spills of construction-related hazardous materials. FEIS pages IV.21-8,9 discuss mitigation measures, which include the development of a spill pollution, control and countermeasures plan for the transport, storage and handling of hazardous materials, and a hazardous substances management and contingency plan for the removal, storage, transportation and disposal of hazardous wastes. The FSEIS presents no additional information which would alter the FEIS conclusions with regard to this mitigation.

M. Construction

FEIS Chapter IV Section 23 and FEIS Appendix J, discussed the temporary impacts to the environment associated with the construction activities necessary to implement the preferred alternative. These temporary impacts included air, water and noise pollution, social and socio-economic impacts, and the disruption of surface transportation patterns. Since detailed design and construction plans for the proposed projects had not yet been prepared, it was not then possible to identify the specific types of construction equipment or the frequency of its usage. Accordingly, the FEIS discussed a range of construction-related impacts, using worst-case assessments which assume a range of excavation sources and means of transporting fill material.

Under the FEIS worst-case analysis, absent mitigation, the most significant construction-related impacts would be a temporary degradation of the level of service levels on freeways, highways, arterials, and permitted local streets used for truck hauling of fill material through congested areas during peak travel times.

The FEIS construction impacts section discussed mitigation measures, including the development of a construction and earthwork management plan, which will specify hours of operation, haul routes, and similar controls, and would discourage haul activities along extremely congested routes and during extreme roadway congestion periods. This plan would also provide for signalization and other improvements to several intersections in the vicinity of the airport which may be impacted by construction hauling activity.

Additional construction-related mitigation measures include property acquisition to minimize potential social and neighborhood disruption, fill spillage prevention and removing

procedures, fugitive dust prevention, and an erosion and sediment control plan.

FSEIS Chapter 5, section 5-4, presents additional information developed since publication of the FEIS, including changes to construction phasing, a lengthening of the runway haul duration, the identification of additional haul routes, and the identification of two temporary interchanges on SR 518 and SR 509. This additional information permitted a refined analysis of possible construction impacts in the FSEIS, and the identification of additional mitigation measures presented at FSEIS Table 5-4-8.

Based on the selected fill hauling plan, the FAA will require the POS to include essential provisions of its construction and earthwork management plan in construction earthwork bid documents as contractual requirements.

VII. DECISION AND ORDER

Although the "No Action" alternatives have fewer developmental impacts than the preferred alternative, they fail to achieve the purposes and needs for these projects. For the reasons summarized earlier in this ROD, and supported by detailed discussion in the FEIS and FSEIS, the FAA has determined that the preferred alternatives are the only possible and prudent alternatives as well as the most practicable.

Having made this determination, the two remaining decision choices available for the FAA are to approve the agency actions necessary for the projects' implementation, or to not approve them. Approval would signify that applicable Federal requirements relating to airport development planning have been met, and would permit the Port of Seattle to proceed with the proposed development and receive Federal funds for eligible items of development. Not approving these agency actions would prevent the Port of Seattle from proceeding with Federally supported development in a timely manner.

I have carefully considered the FAA's goals and objectives in relation to various aeronautical aspects of the proposed master Plan Update development actions discussed in the FEIS, including the purposes and needs to be served by the projects, the alternative means of achieving them, the environmental impacts of these alternatives, the mitigation necessary to preserve and enhance the environment, and the costs and benefits of achieving these purposes and needs in terms of effective and fiscally responsible expenditure of Federal funds.

Based upon the administrative record of this project, I make the certification prescribed by 49 U.S.C. § 44502 (b), that implementation of the preferred alternatives approved in this ROD are reasonably necessary for use in air commerce.

Therefore, under the authority delegated to me by the Administrator of the FAA, I find that the projects summarized in this ROD at Appendix B are reasonably supported, and for those projects I therefore direct that action be taken to carry out the agency actions discussed more fully in Section II of this Record, including:

A. Approval under existing or future FAA criteria of project eligibility for Federal grant-in-aid funds and/or Passenger Facility Charges, including the following elements:

1. Land Acquisition
2. Site Preparation
3. Runway, Taxiway, and Runway Safety Area Construction
4. Terminal and Other Landside Development
5. Certain POS-Installed Navigational Aids
6. Environmental Mitigation

B. Approval of a revised airport layout plan (ALP), based on determinations through the aeronautical study process regarding obstructions to navigable airspace, and that the agency does not object to the airport development proposal from an airspace perspective.

C. Approval for relocation/upgrade of the existing Airport Traffic Control Tower (ATCT), radars, and various navigational aids. I specifically reaffirm, in the context of the policy considerations set forth in this ROD, my April 4, 1997, approval of the SEA-TAC ATCT Siting Study. As demonstrated by that study, a replacement ATCT at SEA-TAC is required immediately, whether or not the other Master Plan Update development actions are approved.

D. The development of air traffic control and airspace management procedures to effect the safe and efficient movement of air traffic to and from the proposed new runway, including the development of a system for the routing of arriving and departing traffic and the design, establishment, and publication of standardized flight operating procedures, including instrument approach procedures and standard instrument departure procedures.

Lawrence B. Andriesen 7-3-97
Lawrence B. Andriesen Date
Regional Administrator,
Northwest Mountain Region

RIGHT OF APPEAL

This decision constitutes the Federal approval for the actions identified above and any subsequent actions approving a grant of Federal Funds to the Port of Seattle. Today's action is taken pursuant to 49 U.S.C. Subtitle VII, Parts A and B, and constitutes a Final Order of the Administrator, subject to review by the courts of appeals of the United States in accordance with the provisions of 49 U.S.C. § 46110.

B

INTERLOCAL AGREEMENT, AIRPORT COMMUNITIES COALITION

In accordance with the Interlocal Cooperation Act (Revised Code of Washington, Chapter 39.34) the City of Normandy Park, the City of Des Moines, the City of Burien, the City of Federal Way, and the City of Tukwila (hereafter the "Parties"), each of which is a Washington Municipal Corporation hereby enter into the Agreement set forth.

RECITALS

1. The parties hereto have expressed their opposition to the development of a third runway, and other system improvements leading to increased air traffic at Seattle-Tacoma International Airport and Boeing Field.

2. The parties further believe that regional public transportation needs must be resolved on a regional basis and that only equitable solutions to those needs must be adopted. Additional development of Seattle-Tacoma International Airport and/or increased air traffic at Boeing Field do not constitute equitable or responsible regional solutions.

3. The parties believe that a collective effort including the pooling of resources and the execution of this Agreement to express and administer policy matters is the most effective and expeditious method of achieving the goals stated herein.

4. The parties agree to promote the following goals:

A. To stop the construction of any additional runways at Seattle-Tacoma International Airport.

B. To limit or reduce the number of flight operations in King County, at both Seattle-Tacoma International Airport and at Boeing Field, to a specific level and to eliminate night flights from 10:30 p.m. to 7:00 a.m.

C. To limit airport facilities expansion in King County, at both Seattle-Tacoma International Airport and at Boeing Field, in order to prevent a significant increase in the number of flight operations which is likely to have substantial, adverse environmental impacts.

D. To revoke the "Four Post Plan".

E. To develop and promote equitable regional transportation needs solutions on a regional basis.

F. To improve abatement and mitigation of airport impacts in the Coalition cities.

G. Such other and further related goals as may be determined by the Executive Committee.

NOW THEREFORE THE PARTIES HEREBY AGREE AS FOLLOWS:

I. DEFINITIONS AND USAGES

A. Each of the parties hereto shall be referred to as "Normandy Park", "Des Moines", "Burien", "Tukwila", "Federal Way", or such other public agency as may be admitted.

B. "Airport Communities Coalition" hereinafter referred to as "ACC" is the entity created by this Interlocal Agreement, which is comprised of one representative from each party hereto.

C. "Executive Committee" means the assembly of representatives from the parties hereto, the function of which is to administer the policy and purposes of this Agreement.

D. "Chair" means the presiding member of the Executive Committee, who shall be elected by the other representatives to the executive committee.

E. "Participate" or "participation" means the right of a party to vote on any matter submitted to the Executive Committee for a vote, upon payment of the minimum financial contribution specified hereunder.

F. "Encumbered expenses" means financial obligations, enforceable in law or equity, which have been incurred by the Executive Committee.

II. UNDERSTANDING AND PURPOSES

A. The parties understand and agree to promote the goals set forth in Recital 4 above and such other goals and policies as are determined by the Executive Committee.

B. The parties agree and understand that they will rely on the Executive Committee's faithful and responsible representation of the parties' collective and individual interests in making their important land use and transportation planning decisions under this Agreement.

C. In furtherance of this Agreement the parties will:

1. Establish and maintain clear lines of communication through their representatives on the Executive Committee.

2. Coordinate participation in continued planning and environmental review processes concerning air transportation and environmental matters arising therefrom, both as to existing facilities or planned alternatives.

3. Prepare for and undertake litigation or other actions that may be required in order to further the parties' common objectives.

4. Conduct meetings of the Executive Committee in order to carry out necessary and proper functions of ACC as set forth herein.

5. Establish and fund a budget, with amendments thereto as necessary in order to carry on the activities of ACC. This operating fund shall be known as the "Operating Fund of ACC Executive Committee Joint Board."

6. The Executive Committee shall not acquire any real property. Personal property shall be acquired as necessary to carry out the purposes of this Agreement.

III. DURATION

This Agreement shall remain in full force and effect so long as at least two parties continue the operation of this Agreement. Any party may withdraw from this Agreement and may be discharged from its obligations hereunder, provided that it has paid all outstanding financial contributions, including its proportionate share for any encumbered expenses, for which it is liable pursuant to Section VIIA and upon not less than sixty (60) days written notice to the Executive Committee; provided, further, that immediately upon notification of an intent to withdraw from this Agreement, the withdrawing party shall not be liable for any further financial obligations incurred by the ACC.

Any party so withdrawing shall be entitled to a ratable refund of any payment previously made to the Operating Fund after payment of the withdrawing party's share of any outstanding or encumbered debts incurred prior to the receipt by the Executive Committee of the sixty days written notice of withdrawal. Any parties remaining to the Agreement may unanimously determine to terminate this Agreement. Upon such termination, the remaining assets of ACC, if any, will be divided pro rata on the same percentages as are in effect on the date of termination as set forth under Section VII below.

IV. ELIGIBILITY

Eligibility to participate in this Interlocal Agreement shall be limited to any "public agency" as defined by RCW 39.34.020. A public agency seeking to participate in this Agreement may be allowed to do so, upon approval of the Executive Committee, pursuant to the existing terms hereof and upon the payment of at least $100,000 to the Operating Fund established in Section II.C.5 of this Agreement.

The Executive Committee by unanimous vote may allow admission by a public agency on terms other than those set forth herein for participation. Any public agency so admitted shall be deemed an ex officio party hereto and shall not be entitled to a vote on matters submitted to the Executive Committee.

V. CREATION OF AIRPORT COMMUNITIES COALITION (ACC) - EXECUTIVE COMMITTEE

There is hereby created the Airport Communities Coalition (ACC). This organization shall be a voluntary association of the parties hereto. The association shall be governed by the Executive Committee. The Executive Committee shall be comprised of one voting member from each party who shall be an elective official of such party.

The voting member of each party shall be duly selected annually by the legislative body of each party thereof. Each party shall similarly select an alternate voting member of the Executive Committee who shall serve in the absence of the voting member. Such alternate may be either an elected or appointed official of the party.

The Executive Committee shall by majority vote, except as herein otherwise provided, develop and implement policy in order to implement the goals set forth herein, adopt and administer a budget, receive funding from the parties for such budget, and seek such outside professional assistance as is necessary to achieve the purposes set forth herein. The funds of ACC shall be subject to audit in the manner provided by the law for the auditing of public funds.

Regular meetings of the Executive Committee shall be held as determined by the Executive Committee. The Executive Committee shall elect annually by majority vote a "chair" to conduct its meetings. The chair shall not forfeit, by virtue of the position of chair, any power vested in him/her and in addition will schedule and preside over meetings. The chair shall continue to preside at the pleasure of a majority of the voting members of the Executive Committee, and may be replaced at any time.

A quorum for the conduct of business by the Executive Committee shall be a majority. Notice of any special meeting shall be circulated to all members of the Executive Committee by the chair, or upon the written notice of a voting majority of the Executive Committee not less than twenty-four (24) hours before such meeting is scheduled. No action will be taken without a quorum and without an absolute majority of the eligible voting members of the Executive Committee voting in favor of the matter under consideration. Executive Committee members may attend meetings and vote telephonically as may be necessary for the orderly and timely conduct of business. Written notice of any special meeting may be waived as to any member who at the time of the meeting is actually present or who has filed with the chair a written waiver of notice. The parties further agree and understand that the purpose of ACC Executive Committee meetings is to discuss with representing legal counsel litigation or potential litigation to which the parties are, or are likely to become, a party when public

knowledge regarding the discussion is likely to result in an adverse legal or financial consequence to the parties.

VI. PROFESSIONAL SERVICES

A. The Executive Committee may, from time to time, retain legal or other professional assistance or contribute to the retention by one of the parties of legal or other professional assistance to carry out the purposes of this Agreement. A contract or engagement letter shall be provided for each consultant so retained, which contract or engagement letter shall subsequently be marked as an Exhibit and incorporated into this Agreement, subject to all terms herein.

B. Information and materials developed by providers of professional services, who are retained and are compensated pursuant to the provisions of this Agreement, shall be made available to each party to this Agreement which has borne its share of the cost of providing such services in the manner provided herein. In order to preserve confidentiality, all meetings of the legislative or governing body of any party to this Agreement related to any of the subjects of this agreement shall be held in executive session pursuant to RCW 42.30.110(i) and all written materials transmitted by Cutler & Stanfield or successors or associates of Cutler & Stanfield or the Executive Committee to any party to this Agreement shall be considered exempt from public inspection and copying under RCW 42.17.310 unless publicly cited by the party in connection with any party action.

VII. SHARING OF COSTS

A. In order to pay such fees, costs, and other expenses as are incurred by the Executive Committee on behalf of ACC including costs incurred in connection with the retention of legal or other professional assistance, it is the intention of the parties to this Agreement that each party will make available to ACC consistent with the provisions herein, funds as follows:

City of Normandy Park	$600,000 for 1996 operating expenses;
City of Des Moines	$600,000 for 1996 operating expenses;
City of Burien	$600,000 for 1996 operating expenses;
City of Tukwila	$100,000 for 1996 operating expenses;
City of Federal Way	$100,000 for 1996 operating expenses.

B. Each party pledges its best efforts to approve appropriations providing for the sharing of costs specified in this Section VII, but no party shall be liable for any monetary assessment unless and until the governing body of such party has appropriated funds for such specific purpose.

C. In the event that one or more of the parties to this Agreement fail to contribute to the sharing of costs in the amount set forth above and in a manner consistent with provisions of this Agreement, the party in default will refrain from further

participation in the Executive Committee's business, and its rights pursuant to this Agreement shall be suspended.

D. In the event one or more parties fail to ratify this Agreement or having initially ratified this Agreement and thereafter defaults or withdraws from this Agreement, the cost sharing set forth above in Section "A" shall be adjusted on a pro rata basis to total 100% following the elimination of the party or parties and such adjusted percentages shall apply to any outstanding or future costs; provided, however, that the monetary obligation of the remaining Party or Parties shall not exceed that amount set forth above in Section "A"; and, provided further, that any remaining party may elect to terminate its participation as opposed to contributing any such additional funds.

VIII. COOPERATION

Each of the parties participating in, or otherwise admitted to, this endeavor shall cooperate with the ACC Executive Committee. In that regard, each party hereto, whether involved by participation, admission, or otherwise, hereby covenants and agrees that, in the event of withdrawal, each such party shall not sue, harass, or in any form or manner interfere with the entity created by this Agreement or with any of the remaining parties, except as necessary to obtain the return of all contributed but unexpended funds set forth in section VIIA. This covenant shall specifically prohibit the sharing of any information obtained in any manner, directly or indirectly, as a result of the withdrawing party's involvement in ACC or otherwise pursuant to this Agreement unless otherwise required by public records law.

IX. INDEMNIFICATION

A. In executing this Agreement, the ACC does not assume liability or responsibility for or in any way release the Parties from any liability or responsibility which arises in whole or in part from the existence, validity or effect of city ordinances, rules or regulations. If any such cause, claim, suit, action or administrative proceeding is commenced, the Parties shall defend the same at their sole expense and if judgment is entered or damages are awarded against the Parties, ACC, or both, the Parties shall satisfy the same, including all chargeable costs and attorneys' fees.

B. ACC shall indemnify and hold harmless the Parties and their officers, agents, volunteers and employees, or any of them, from and against any and all claims, actions, suits, liability, loss, costs, expenses, and damages of any nature whatsoever, which are caused by or result from a negligent act or omission of the ACC, its officers, agents, and employees in performing services pursuant to this Agreement. In the event that any suit based upon such a claim, action, loss, or damage is brought against the Parties or the Parties and ACC, ACC shall defend the same at its sole cost and expense; and if final judgment be rendered against the Parties and their officers, agents, and employees or jointly against the Parties and ACC and their respective officers, agents, and employees, ACC shall satisfy the same.

C. The Parties shall indemnify and hold harmless ACC and its officers, agents, and employees, or any of them, from and against any and all claims, actions, suits, liability, loss, costs, expenses, and damages of any nature whatsoever, which are caused by or result from a negligent act or omission of the Parties, their officers, agents, and employees. In the event that any suit based upon such a claim, action, loss, or damage is brought against ACC or the Parties and ACC, the Parties shall defend the same at their sole cost and expense; and if final judgment be rendered against ACC, and its officers, agents, and employees or jointly against ACC and the Parties and their respective officers, agents, and employees, the Parties shall satisfy the same.

X. MISCELLANEOUS PROVISIONS

A. This Agreement shall be effective upon ratification by at least two of the Cities except as otherwise provided in Section IV above. This Agreement may be amended only upon consent of all parties thereto. Any amendment hereto shall be in writing.

B. The waiver by any party of any breach of any term, covenant, or condition of this Agreement shall not be deemed a waiver of such term, covenant, or condition or any subsequent breach of the same of any other term, covenant, or condition of this Agreement.

C. Any party hereto shall have the right to enjoin any substantial breach or threatened breach of this Agreement by any other party, and shall have the right to recover damages and to specific performance of any portion of this Agreement.

D. This Agreement is solely for the benefit of the parties hereto and no third party shall be entitled to claim or enforce any rights hereunder except as specifically provided herein.

E. In all contractor services, programs or activities, and all contractor hiring and employment made possible by or resulting from this Agreement, ACC and the Parties shall abide by all federal, state, and local laws prohibiting discrimination.

F. The records and documents with respect to all matters covered by this Agreement shall be subject to audit by the Parties during the term of this contract and three (3) years after termination.

G. If any provision of this Agreement or application thereof to any party or circumstance, is held invalid by a court of competent jurisdiction, such invalidity shall not affect the other provisions of this Agreement which can be given effect without the invalid provision or application, and to this end the provisions of this Agreement are declared to be severable.

H. This Agreement shall be effective whether signed by all parties on the same document or whether signed in counterparts.

I. This Agreement supersedes the Interlocal Agreement entered into between the parties by signatures dated February 27, 1995, February 27, 1995, March 8, 1995, March 14, 1995 and March 24, 1995.

APPROVED AS TO FORM this_____ day of _____, 1996.

By_____
Wilton S. Viall, III
City Attorney of Normandy Park

DATED this _____ day of _____, 1996.

CITY OF NORMANDY PARK

By_____
Merlin Reynolds
Its City Manager
At the direction of the Normandy Park City Council by motion regularly passed at an open public meeting on _____.

APPROVED AS TO FORM this_____ day of _____, 1996.

By Harry N. McCrary, Jr.
James B. Gorham
City Attorney of Des Moines

DATED this _____ day of _____, 1996.

CITY OF DES MOINES

By_____
Greg Prothman
Its City Manager
At the direction of the Des Moines City Council by motion regularly passed at an open public meeting on January 25, 1996.

APPROVED AS TO FORM this_____ day of _____, 1996.

By_____
Michael Kenyon
City Attorney of Burien

DATED this _____ day of _____, 1996.

CITY OF BURIEN

By_____
Frederick Stouder
Its City Manager
At the direction of the Burien City Council by motion regularly passed at an open public meeting on _____, 19___.

APPROVED AS TO FORM this_____ day of _____, 1996.

By_____
Linda P. Cohen
City Attorney of Tukwila

DATED this _____ day of _____, 1996.

CITY OF TUKWILA

By_____
John W. Rants
Its Mayor
At the direction of the Tukwila City Council by motion regularly passed at an open public meeting on _____, 19____.

APPROVED AS TO FORM this_____ day of_____, 1996.

By_____
Londi K. Lindell
City Attorney of Federal Way

DATED this _____ day of _____, 1996.

CITY OF FEDERAL WAY

By_____
Kenneth E. Nyberg
Its City Manager
At the direction of the Federal Way City Council by motion regularly passed at an open public meeting on _____, 19___.

CONTRACTS:ACC96A/95-022
1/22/96

C

(Cite as: 165 F.3d 35, 1998 WL 833628 (9th Cir.))

NOTICE: THIS IS AN UNPUBLISHED OPINION.

(The Court's decision is referenced in a "Table of Decisions Without Reported Opinions" appearing in the Federal Reporter. Use FI CTA9 Rule 36-3 for rules regarding the citation of unpublished opinions.)

United States Court of Appeals,
Ninth Circuit.

CITY OF NORMANDY PARK; City of Des Moines; City of Burien; City of Federal Way; City of Tukwila; Highline School District, No. 401, individually and collectively as the Airport Communities Coalition; Petitioners,
v.
PORT OF SEATTLE, a Washington municipal corporation, Intervenor-Respondent,
v.
FEDERAL AVIATION ADMINISTRATION; U.S. Department of Transportation, Respondents.

No. 97-70953.
Argued and Submitted Nov. 6, 1998.
Decided Nov. 24, 1998.

Petition to Review a Decision of the United States Department of Transportation Federal Aviation Administration.

Before CANBY and HAWKINS, Circuit Judges, and SILVER, [FN**] District Judge.

FN** Honorable Roslyn O. Silver, United States District Judge for the District of Arizona, sitting by designation.

MEMORANDUM [FN*]

FN* This disposition is not appropriate for publication and may not be cited to or by the courts of this circuit except as provided by Ninth Circuit Rule 36.3.

**1 Petitioners ("the Cities") appeal the Federal Aviation Administration's decision granting final approval of the Master Plan development project adopted by the Port of Seattle for the expansion of the Seattle-Tacoma International Airport ("Sea-Tac"). We affirm.

The Cities argue that the Administrator's decision improperly relied on a "no growth" demand model and a limited prediction forecast thereby failing to accurately assess the project's environmental impacts and necessary mitigation measures. Under the Airport and Airway Improvement Act ("AAIA"), 49 U.S 47106(c)(1)(C), an Administrator may approve an airport development project that is found to have significant environmental effects "only after finding that ... every reasonable step has been taken to minimize the adverse effects." Here, the Administrator's lengthy decision indicates a careful review of the project's potential environmental impacts, a host of mitigation measures and the entire administrative record. Moreover, it was within the agency's discretion to select a testing method for determining airport deman *S Seattle Comm. Council Federation v. Federal Aviation Admi* 961 F.2d 829, 833-34 (9th Cir.1991). Because intervening circumstances called into question the 2020 model's accuracy, the Administrator was also entitled to rely on a prediction forecast to the year 201 *See City of Los Angeles v. Federal Aviation Adn* 138 F.3d 806, 808 (9th Cir.1998).

Next, the Cities argue that the Administrator's decision violates the AAI 47106(a)(1), which requires that "the project is consistent with plans ... of public agencies authorized by the State in which the airport is located to plan for the development of the area surrounding the airport." The Cities' argument is unavailing because the Administrator was allowed to rely on the approval of the Puget Sound Regional Council, the designated Metropolitan Planning Organization responsible for transportation planning in the region, to satisfy the consistency requiremen *Se Suburban O'Hare Comm'n v. Dole,* 787 F.2d 186, 199 (7th Cir.1986) . Moreover, the administrative record indicates that every effort was made to ensure consistency with planning efforts of local communities.

Finally, the Cities contend that the Sea-Tac project violates the Clean Air Act, 42 U.S. § 7506(c),

that prohibits federal agencies from supporting "any activity which does not conform to [the State's] implementation plan." This contention also fails because the FAA conducted extensive environmental analyses, including a conformity analysis, and ultimately found that the air emissions levels would be "de minimis." 40 §F.R. 93.153(c)(1). Moreover, the United States Environmental Protection Agency, the State of Washington Department of Ecology, and the Puget Sound Air Pollution Control Agency all agree with the FSEIS conclusion.

The FAA Administrator's decision was supported by substantial evidence.

**2 AFFIRMED.

END OF DOCUMENT

D

Honorable Robert H. Alsdorf
Trial Date: June 23, 1998

IN THE SUPERIOR COURT FOR THE STATE WASHINGTON IN AND FOR THE COUNTY OF KING

CITY OF DES MOINES, et al., Plaintiffs, v. PUGET SOUND REGIONAL COUNCIL, et al., Defendants.	No. 96-2-20357-2 KNT No. 97-2-13908-2 KNT No. 97-2-22276-1 KNT No. 98-2-04911-1 KNT **(CONSOLIDATED)** FINDINGS OF FACT, CONCLUSIONS OF LAW AND FINAL ORDER
CITY OF DES MOINES, et al., Plaintiffs/Petitioners, v. PORT OF SEATTLE, et al., Defendants/Respondents.	
CITY OF DES MOINES, et al., Plaintiffs, v. CENTRAL PUGET SOUND GROWTH MANAGEMENT HEARINGS Board, et al., Defendants.	

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

AIRPORT COMMUNITIES COALITION, et al.,

Plaintiffs,

v.

PORT OF SEATTLE, et al.,

Defendants.

This consolidated actions in this lawsuit challenge: (1) the legislative decisions of the Commissioners of the Port of Seattle adopting Port Resolution 3212 and Port Resolution 3245, which approved the Master Plan Update development actions at the Seattle-Tacoma International Airport, including construction of a new runway; (2) the Final Decision and Order ("FDO") of the Central Puget Sound Growth Management Hearings Board ("Board") in CPSGMHB Case No. 97-3-0014, which determining that the comprehensive plan of the City of Des Moines does not comply with the Growth Management Act ("GMA") and invalidating two plan provisions; and (3) the quasi-judicial Findings, Conclusions And Decision of the Port of Seattle Hearing Examiner upholding the adequacy of the Port's Master Plan Update environmental impact statement ("EIS") and supplemental environmental impact statement ("SEIS"). The court has read and considered the briefs of the parties and the administrative record as filed with the Court and as supplemented by order of the Court. On June 23, 1998, the court heard oral argument on all of the remaining claims in these four consolidated actions. On July 1, 1998, the Court received and reviewed supplemental briefing on HB 1487.

At oral argument, the petitioner Airport Communities Coalition and its constituent member cities ("Coalition") were represented by Cutler & Stanfield, L.L.P., and Perry Rosen, and by Cairncross & Hempelmann, P.S., and John Hempelmann. Respondents Port of Seattle, the Port of Seattle Commissioners, the Port of Seattle Responsible SEPA Official, and the Port of Seattle

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

Hearing Examiner were represented by Foster Pepper & Shefelman PLLC and Tayloe Washburn and Roger Pearce. Respondent Central Puget Sound Growth Management Hearings Board was represented by the Washington Attorney General and Marjorie Smitch, and respondent Puget Sound Regional Council ("PSRC") was represented by Bricklin & Gendler, LLP, and Jennifer Dold.

Based on the its review of the administrative record and the briefs of the parties, and its rulings entered today concerning the application of WAC Ch. 365-195, the Court enters the following Findings of Fact, Conclusions of Law and Final Decision.

I. FINDINGS OF FACT

1. The Seattle-Tacoma International Airport ("STIA") is the primary commercial service airport for the Pacific Northwest region. STIA is the only airport that provides scheduled commercial air carrier service to the 2.8 million residents of the four-county Central Puget Sound area.

2. The Port of Seattle ("Port"), which operates STIA, is a special district unit of government under state law and is governed by an elected commission. The Port's governing commission is elected by the voters of King County.

The Background Regional Planning Studies Address the Region's Need for Improved Commercial Air Transportation Facilities at STIA.

3. In the mid-1980s, the Port completed the Airport Comprehensive Planning Review And Airspace Update Study, which concluded that the existing runway system at STIA would not be capable of efficiently serving the increasing demand for air traffic past the year 2000. The Federal Aviation Administration ("FAA") initiated an Airport Capacity Enhancement Study, which concluded that there was extensive delay at STIA, primarily in poor weather conditions, as a result of the close spacing of the two existing runways. In 1995, the FAA conducted a Capacity Enhancement Update Study, which confirmed the results of the earlier capacity study.

4. In 1989, the Port and the Puget Sound Regional Council of Governments initiated the Flight Plan Project to study alternatives and recommend solutions for meeting the region's long-term air transportation needs. As part of the Flight Plan Project, the Flight Plan programmatic EIS was

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

prepared and issued in October 1992. The Flight Plan EIS analyzed 34 alternative strategies for meeting the region's air transportation needs. At the conclusion of the Flight Plan studies and public process in 1992, the Flight Plan Report recommended implementation of a multiple airport system, including the addition of a new air carrier runway at STIA.

5. In April 1993, the PSRC General Assembly adopted Resolution A-93-03, amending the Regional Transportation Plan ("RTP") to authorize development of a third runway at STIA: (1) unless a supplemental airport site was proven to be feasible to eliminate the need for a new runway at STIA, (2) after demand management and system management programs are achieved or proven not to be feasible, and (3) when noise reduction performance objectives were scheduled, pursued, and achieved based on independent evaluation and measurement of noise impacts. PSRC established a detailed process to implement Resolution A-93-03, including studies of supplemental airport sites, demand/system management, and existing noise management measures at STIA.

6. After these studies, PSRC concluded that there are no feasible sites for a major supplemental airport within the four-county region.

7. An independent panel reviewed demand/system management programs and noise reduction performance at STIA. That panel concluded that demand/system management would not eliminate the need for a third runway. The panel determined that the noise reduction standards of Resolution A-93-03 had not been met, however, and suggested additional noise reduction measures. The panel noted that the Port has been a national leader in efforts to reduce noise impacts on residents surrounding STIA. The Port's SeaTac Communities Plan, the Part 150 Noise Compatibility Plans, and the innovative Noise Mediation Project have collectively resulted in a series of measures expected to significantly reduce aircraft noise by the year 2001.

8. On July 11, 1996, the PSRC General Assembly passed Resolution A-96-02, which amended Resolution A-93-03 and included a third runway at STIA, with additional noise reduction measures, in the region's RTP.

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

9. On January 23, 1998, this Court dismissed with prejudice the Petitioners' claims challenging PSRC Resolution A-96-02 and the SEPA review for that resolution.

The Port of Seattle's Master Plan Update for STIA and Preparation of the Master Plan Update Environmental Impact Statement.

10. In 1993, the Port initiated an Airport Master Plan Update for STIA, which identified and studied alternative means of meeting the following needs at the Airport: (1) improve the poor weather airfield operating capacity to an acceptable level of delay, (2) provide sufficient runway length to accommodate warm weather operations without restricting passenger load factors or payloads, (3) provide Runway Safety Areas that meet current FAA standards, and (4) provide efficient and flexible landside facilities to accommodate future aviation demand.

11. Also in 1993, pursuant to the National Environmental Policy Act ("NEPA") and the State Environmental Policy Act ("SEPA"), the FAA and the Port initiated preparation of a joint Master Plan Update EIS to analyze the alternatives to, environmental impacts of, and possible mitigating measures for the Master Plan Update improvements at STIA.

12. In 1995, the FAA and Port issued the Master Plan Update Draft EIS, conducted two public hearings, accepted and responded to voluminous written and oral comments, conducted additional studies, and prepared project revisions in response to public comments. The Coalition cities submitted detailed comments on the Draft EIS. Throughout the preparation of the Master Plan Update Final EIS, the Port coordinated with numerous agencies with technical expertise to ensure that the most appropriate methodologies for measuring impacts was followed. In particular, the issue of aviation demand forecasting was coordinated on an ongoing basis with the FAA.

13. On February 9, 1996, the Port issued the Master Plan Update Final EIS, which included all comments on the DEIS and the Port/FAA responses to each comment. Among other impact areas, the EIS identifies the quantity of fill needed for construction of the third runway and the various locations where the fill might be obtained. The EIS identifies numerous haul routes that could be used for transportation of fill. While there may be some flexibility in where the dirt is

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

obtained and how it is transported to the Airport, the EIS recognizes that securing dirt and transporting it to the Airport is a necessary support activity for the expansion of STIA.

Port Adoption of Resolution 3212.

14. On August 1, 1996, the Port Commission adopted Resolution No. 3212, which attached and adopted the Airport Master Plan Update for STIA and granted approval to develop the third runway at STIA. Included with Resolution 3212 was a commitment to mitigate the impacts of the improvements at STIA based on the impacts identified in the Master Plan Update EIS. This list of mitigation measures was in addition to the noise reduction measures called for by the PSRC in its Regional Transportation Plan, which the Port also committed to in Resolution 3212. The mitigating measures are found at Attachment D to Resolution 3212. The PSRC noise mitigation measures are included as Attachment E to Resolution 3212. The mitigation measures included in Resolution 3212 addressed noise, land use, water quality, wetlands, plants and animals, earth, and construction impacts.

The Port's Preparation of the Master Plan Update Supplemental EIS.

15. After publication of the FEIS, the FAA Office of Aviation Policy and Plans in Washington, D.C., issued its fiscal year 1996 Terminal Area Forecast ("TAF") for the nation's airports, including STIA. The fiscal year 1996 FAA TAF predicted levels of aircraft operations and passenger enplanements at STIA that exceeded the numbers of operations and enplanements in the Master Plan Update Final EIS.

16. When the FAA's 1996 TAF was released, a review of the aviation forecasts at STIA was initiated to identify why the forecast was higher and how it would affect the Master Plan Update. P&D Aviation, the Port's Master Plan Update contractor, evaluated the FAA 1996 TAF and supported its general conclusions that activity could grow faster than identified by the Master Plan Update aviation forecasts. This evaluation led to the development of new Port aviation forecasts that showed aircraft operations and passengers estimated to be approximately 17 percent greater (for

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

planning year 2010) than the primary Master Plan Update FEIS forecast. To fully evaluate the possible project-level impacts (and potential mitigation measures) based on the new Port forecasts, the FAA and the Port commissioned a Supplemental EIS ("SEIS").

17. The Draft SEIS (containing a draft Clean Air Act Conformity Analysis) was released in February 1997. In the SEIS, the horizon for the project-specific impact analysis was revised from the year 2020 to 2010 for a number of reasons, including the following: aviation demand had become impossible to forecast with substantial accuracy beyond 2010, airline ticket prices (the primary prediction of aviation demand) had become impossible to reasonably forecast beyond 2010, airline fleet mix and engine mix were not reasonably predictable beyond 2010, new aviation engine technology was not predictable beyond 2010, and background surface traffic was not reasonably predictable beyond 2010 because major transportation projects in the STIA vicinity had been recently and drastically revised.

18. Although the SEIS concluded that detailed impacts could not be meaningfully predicted and analyzed beyond 2010, in order to aid the decision makers using the SEIS, the SEIS contained at Appendix D projections of impacts (based on assumed steady growth rates) to the year 2020, as well as a higher growth rate scenario. Appendix D also contained a projection of impacts based on a higher assumed growth rate.

19. The Coalition cities commented extensively during the comment period following issuance of the Draft SEIS. After reviewing and responding to the Coalition cities' comments and extensive agency and public comments, the Final SEIS (and final Clean Air Act Conformity Analysis) was published on May 13, 1997. The Coalition cities appealed the adequacy of the EIS/SEIS under SEPA to the Port's Hearing Examiner, but have not challenged it under NEPA.

The Master Plan EIS/SEIS Shows the Unique Situation at the Seattle-Tacoma International Airport.

20. The Master Plan EIS/SEIS shows the special circumstances at STIA, which do not affect most U.S. airports. First, STIA is the only commercial airport in the region and is the primary

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

air transportation hub of Washington state and the northwestern United States. As measured by total passengers, STIA is the 21st busiest airport in the country. It is the 18th busiest cargo airport. Because of the central Puget Sound's relative isolation from other parts of the country, there are no other commercial airports within a reasonable driving distance from STIA. Second, the primary problem affecting air transportation at STIA is delay. Although delay is currently a problem during bad weather conditions, those conditions occur 44 percent of the time at STIA. It is not unreasonable to conclude that STIA currently operates at an unacceptable level of delay during bad weather conditions, and that, if the Port does nothing, such delay will dramatically increase in the upcoming decade.

21. Regional planning studies document a critical need to improve the central Puget Sound region's ability to meet the increasing demand for air transportation services. The regional planning body has decided that "there are no feasible sites for a major supplemental airport within the four-county region." Thus, after 10 years of planning, it is not unreasonable to conclude that improvements at STIA are the region's only feasible solution for its air transportation needs.

Port Adoption of Resolution 3245.

22. On May 27, 1997, the Port Commission reaffirmed the approvals and commitments made in Resolution 3212, including the adoption of the revised STIA Master Plan Update and the commitment to undertake the noise reduction measures called for in PSRC Resolution A-96-02. Resolution 3245 included both a summary of the Commissioners' decision-making process (Attach. A) and an updated and expanded list of mitigating measures (Attach. D to Resolution 3245). The Resolution noted that the Final EIS and SEIS included a more complete list of possible mitigating measures. The list of mitigation measures included in Resolution 3245 was subject to further refinement and revision as plans were finalized and permitting processes were completed.

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

The FAA's Record of Decision.

23. On July 3, 1997, the regional administrator for the FAA's Northwest Mountain Region issued a Record of Decision ("ROD") approving the Master Plan Update at STIA. In accordance with the requirements of the Airport and Airways Improvements Act, the ROD provides comprehensive mitigation for the impacts of the third runway project. The ROD includes at Appendix B a June 30, 1997 letter from Washington State Governor Gary Locke on behalf of the Washington State Department of Ecology to the Secretary of the U.S. Department of Transportation which provides "reasonable assurance that the proposed airport development project involving the SeaTac Airport third runway will be located, designed, constructed and operated so as to comply with applicable air and water quality standards." The ROD concluded that "all practical means to avoid or minimize environmental harm have been adopted through appropriate mitigation planning."

24. The ROD also contains an analysis of the impacts of the project and a list of mitigation measures required by the FAA. There are comprehensive federal mitigation requirements under the Airport and Airway Improvement Act ("AAIA") and the Clean Air Act. The ROD mitigation measures include noise, land use, archeological, cultural and historic resources, social and induced socio-economic impacts, air quality, water quality, construction, erosion and sedimentation control, wetlands, flood plains, surface transportation, plants and animals, services/utilities, earth, hazardous substances, and construction impacts.

Port/SeaTac Interlocal Agreement.

25. Before the adoption of the Port resolutions, the City of SeaTac ("SeaTac") and the Port were pursuing discussions concerning the regulatory authority of the two jurisdictions on airport and airport-related projects. These negotiations culminated in an Interlocal Agreement dated September 4, 1997 ("ILA"), which resolved the outstanding jurisdictional issues. Because SeaTac is the host jurisdiction for the STIA expansion, the ILA contains proposed land use policies to ensure

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

the consistency of the SeaTac Comprehensive Plan with the STIA expansion. The ILA also included additional mitigation measures committed to by the Port to address the impacts of STIA expansion.

The Port's Commitment to Comprehensive Mitigation of the Impacts of the Master Plan Update Development Actions.

26. The Port of Seattle, in Resolution 3245, committed to comprehensive mitigation for the impacts of the Master Plan Update development actions, as disclosed in the EIS and SEIS. Those mitigation measures are set forth in Appendix D to Resolution 3245. Most of the Port's mitigation measures are also required by the FAA, pursuant to the Airport and Airways Improvement Act, and outlined at Appendix F to the FAA's ROD.

27. With respect to noise impacts, mitigating measures include:

- acoustical insulation of noise sensitive facilities such as schools, multi-family residences. and institutional uses;
- acoustical insulation of nine significantly impacted buildings;
- acoustical insulation of all eligible single family residences on the Port's waiting list prior to operation of the new runway;
- acoustical insulation of all single family residences that become eligible, based on the Master Plan Update development actions, prior to the operation of the new runway;
- directional soundproofing for homes already insulated;
- acquisition of residences in the Approach Transition Area;
- continuation of the existing noise abatement and noise remedy program at STIA;
- updates of the FAA Part 150 noise studies;
- continued work with local communities in locating compatible land uses near the airport; upgrading the noise monitoring equipment at STIA;
- work with the FAA to reduce reverse thruster use, to voluntarily reduce night flights, and to minimize the number of variances to the noise limitations program;
- work with foreign airlines to ensure the use of Stage 3 aircraft;

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

- work with operators to reduce the number of Stage 2 aircraft and to minimize night engine testing;
- design and implement a noise compatible land use plan for properties in the acquisition zone;
- complete the public buildings insulation pilot studies; and
- seek FAA commitment to preventing violations of north flow nighttime departure procedures.

28. With respect to mitigation of air quality impacts, the air quality agencies have determined that the Master Plan Update development actions will be in conformance with the State Implementation Plan (SIP) and will meet National Ambient Air Quality Standards (NAAQS). Thus, no mitigation is required. Nevertheless, to ensure conformity, the Port, pursuant to a Memorandum of Agreement with the air quality agencies, has committed to fund air measurement studies by DOE in the vicinity of STIA. The Port has also committed to detailed Best Management Practices during construction to ensure that significant air pollution levels do not occur during construction. In addition, the number of annual heavy-duty diesel trips during construction has been limited by the FAA in its ROD.

29. With respect to mitigation of impacts to wetlands, the Port has committed to avoiding and minimizing fill of wetlands whenever possible. For required wetland fill and creek relocation, the Port has committed to no net loss of wetlands and wetland functions. The EIS and SEIS propose replacement of the wetland functions and values in the vicinity of STIA, to the extent such replacement is compatible with safe aircraft operations. The Port has proposed to replace all wildlife attractant values by constructing compensatory wetlands in Auburn. Compensatory mitigation for creek relocation is also proposed.

30. With respect to mitigation of water quality impacts, the Port has proposed a stormwater management plan for the new runway that includes the following:

- detention criteria based on DOE standards;

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

- stormwater outlets designed to reduce channel scouring, sedimentation and erosion, and to improve water quality;
- stormwater outlets with flow dispersion compatible with stream mitigation;
- an ongoing maintenance plan for existing and proposed new stormwater facilities.

Water quality mitigation also includes compliance with the mitigating conditions in the Port's National Pollution Discharge Elimination System (NPDES) permit, which is re-examined and revised from time to time by the Department of Ecology. In addition, a construction erosion and sedimentation control plan will be prepared for the construction of the Master Plan Update improvements, which will incorporate Best Management Practices, including:

- erosion control measures such as mulching, silt fencing, sediment basins and check dams;
- spill containment areas to capture and contain any spills at construction sites and prevent their entry into surface or ground water;
- installation of temporary fuel storage and maintenance areas to reduce the potential for spills and contamination;
- phasing of construction activities to minimize the amount of area that is disturbed at any one time;
- use of temporary and permanent terraces for fill slopes and cut slopes to reduce erosion and to reduce transport of eroded materials; and
- installation of gravel and wheel wash facilities on construction equipment access roads to minimize transport of sediment onto nearby roadways.

31. With respect to mitigation of construction impacts, the Port has committed to prepare a construction and earthwork management plan to govern acquisition and placement of fill material for the Master Plan Update development actions. The plan will address the methods for acquiring and transporting fill material, including designation of haul routes, hours of operation, traffic control and route mitigation. The final content of the plan will depend on the methods of transport

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

ultimately selected. The Port has also committed to a construction acquisition plan in order to mitigate the disruption that could occur in the general vicinity of the proposed new runway construction. The Port has also committed to the extensive Construction Best Management Practices identified in the Final SEIS at Table 5-4-8 (SEIS at pp. 5-4-37 through 5-4-41).

32. With respect to mitigation of land use impacts, the Port has committed to the mitigating conditions for noise discussed above. In addition, the Port has committed to work with surrounding communities to develop compatible land use plans with the airport uses, to prepare a compatible land use plan for the acquisition areas acquired by the Port for noise mitigation, and to evaluate the acquisition of properties in the approach transition areas.

33. With respect to mitigation of transportation impacts, many of the transportation improvements and parking improvements are included in the Master Plan Update proposal itself. In addition, the Port has agreed to support and share in the costs of developing the 28th/24th Avenue South arterial and airport link roadway, to support the planned development of SR-509 by the State of Washington, to develop the south airport access solution if SR-509 does not proceed for any reason, to plan jointly with the City of SeaTac on transportation issues, and to construct roadway improvements at the intersections of 24th Ave. S./S. 154th St. and at SR-99/S.160th St.

Growth Management Hearings Board Decision on City of Des Moines' Plan.

34. In February 1997, the Port filed a petition with the Central Puget Sound Growth Management Hearings Board ("Board") challenging numerous policies in the Comprehensive Plan of the City of Des Moines ("Des Moines Plan") as violative of the GMA. CPSGMHB Case No. 97-3-0014.

35. On August 13, 1997, the Board entered a Final Decision and Order ("Board FDO"), unanimously ruling that the Des Moines Plan did not comply with the GMA and invalidating two plan policies. The Board ruled that STIA was an essential public facility ("EPF"), protected by RCW 36.70A.200. The Board also held that the expansion of an existing EPF, including necessary

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

support activities associated with that expansion, was protected by RCW 36.70A.200. The Board determined that the Des Moines Plan unlawfully precluded, by making impossible or impracticable, expansion of STIA.

36. The Board ruled that the Des Moines Plan violated the GMA because the Plan expressed the City's clear intent to exercise its municipal authority to prevent expansion of STIA, not to mitigate its impacts. The policies at issue in the Des Moines Plan did not require mitigation, but instead directed the City to oppose any new facilities at STIA that increased the impacts to the City of Des Moines. The Board did not rule that the Port could avoid reasonable mitigation of adverse impacts associated with the expansion of STIA.

37. Two members of the Board decided that it was unnecessary to reach the issue of whether the Des Moines Plan also violated the interjurisdictional plan consistency and countywide planning policy consistency requirements of RCW 36.70A.100 and .210. One Board member decided that the Plan violated these provisions as well and wrote a concurring opinion to that effect.

38. In addition to finding the Des Moines Plan not in compliance with GMA, the Board invalidated two Des Moines Plan policies because those policies substantially interfered with GMA's transportation goal which requires local governments planning under GMA to "[e]ncourage multimodal transportation systems that are based on regional priorities and coordinated with county and city comprehensive plans." Those invalidated policies are strategy 1-04-05 and strategy 5-04-04:

- Strategy 1-04-05: Intergovernmental Cooperation/Annexation: (1) When decisions are made by state, county, regional agencies, tribes , or special purpose districts, and those decisions are clearly in the best interests of the state, county or region, take appropriate measures to implement those decisions within Des Moines and the Planning Area, unless the decisions unfairly or negatively affect the residences or businesses in the Des Moines area. (Emphasis added.)

- Strategy 5-04-04: Adopt development regulations as needed that provide a process for the identification and possible siting of essential public facilities. Cooperatively work with surrounding municipalities and King County during the siting and development of facilities

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

of regional significance. Oppose new facilities associated with Sea-Tac International Airport that increase adverse impacts to the City of Des Moines. (Emphasis added.)

39. The record before the Board shows that in order to construct the STIA improvements planned for in the Port's Master Plan Update, it is necessary for trucks hauling fill dirt to travel through the streets of one or more of the cities of SeaTac, Des Moines, Burien, Tukwila and Normandy Park.

40. The record before the Board shows that the City of Des Moines developed and adopted certain comprehensive plan policies and development regulations which would permit it to stop trucks moving fill, and thereby to directly or indirectly prevent STIA expansion.

41. Since 1993, the Coalition cities have entered into a series of interlocal agreements with the primary stated purpose being to "stop the construction of any additional runways" at STIA.

42. Under the GMA, airports such as STIA are expressly included in the definition of essential public facilities.

The Decision of the Port of Seattle Hearing Examiner Finding the EIS and SEIS to be Legally Adequate.

43. The Master Plan Update Final EIS was issued in February 1996. In Port Resolution 3212, the Port determined that EIS was legally adequate for its decision to approve the Master Plan Update development actions. Because of the changed forecasts of aviation activity at STIA, the Port and FAA prepared the Master Plan Update SEIS. The Master Plan Update Final SEIS was issued on May 13, 1997. In Port Resolution 3245, the Port determined that the SEIS was legally adequate for its decision to approve the Master Plan Update development actions as amended. Both EISs were administratively appealed by the Coalition cities to the independent Hearing Examiner of the Port of Seattle.

44. The Hearing Examiner reviewed the extensive record on the EISs, reviewed written testimony submitted by all parties, and heard five days of testimony and legal argument on December 1 through 5, 1997. On January 30, 1998, the Examiner issued a detailed Findings,

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

Conclusions And Decision ("Examiner's Decision"), which held that the EIS and SEIS are legally adequate.

Findings Relating to the EIS Forecast Methodology and Analysis.

45. The Coalition argues that the EIS is inadequate because the forecasts on which it is based show the same number of enplanements (passengers) under both the With Project and No Action alternatives.

46. When the Port and the FAA began preparation of the Master Plan Update EIS, they retained P&D Aviation to prepare the forecast that served as the basis for the Master Plan Update EIS (the "1994 forecast"). Later, in 1996, when a decision was made to update the forecast, the Port again retained P&D Aviation to prepare the updated forecast (the "1996 forecast"). P&D Aviation had experience in preparing aviation forecasts for the Puget Sound region, having prepared the forecast that served as the basis for the Flight Plan EIS issued by the Port and the PSRC in 1992.

47. The forecasting expert at P&D Aviation primarily responsible for the preparation of the STIA forecasts was Stephen L. Allison, Senior Aviation Planner. Mr. Allison has 30 years experience in the aviation planning and consulting field, having served as project manager or lead aviation planner on the development of over 30 airport master plans and regional aviation system plans. While he functions as project manager or lead aviation planner on a variety of airport planning assignments, his specialty is the preparation of forecasts of aviation activity for individual airports and multiple-airport regions.

48. The approach used in preparing the STIA forecasts is widely accepted and used throughout the aviation industry. Mr. Allison generally described the process utilized as consisting of the following steps:

- Analyze historic airport activity data and trends (such as passengers, air cargo, and aircraft operations).

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

- Assess the conditions and factors which influence the demand for aviation activity, including the local and national economies, air fares, changes in airline service, competing airports, technological advances in telecommunications, and international economic growth and bilateral agreements.
- Obtain input from the aviation community, particularly the airlines serving STIA, to obtain their opinions regarding the future of aviation demand in general and at STIA.
- Develop a mathematical relationship between a component of airport activity (e.g., domestic passengers) and the factors (explanatory variables) which are historically shown to strongly affect it. Evaluate this mathematical relationship, or "model," to ensure that it is logical for forecasting aviation demand and passes key statistical tests.
- Obtain projections of the factors in the model affecting airport activity, then use the model with the projected factors to derive a forecast of the airport activity.
- Evaluate the probable effects on the forecast of factors not explicitly accounted for in the model, such as telecommunications, demand management techniques, and high speed rail.
- Develop alternative forecast approaches as a check against the results of the model.
- Prepare upper-range and lower-range forecasts based on the alternative approaches to illustrate the potential range of outcomes.
- Compare the master plan forecast with forecasts prepared in other studies (such as flight plan) and by the FAA and evaluate differences in the purpose for the forecast, the forecast approach, and assumptions.

49. The evidence showed that three factors stand out as having the greatest correlation with aviation demand at STIA and the greatest predictive value for estimating future aviation demand at STIA. These three factors are (a) the population of the airport's service area, (b) personal

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

income in the service area, and (c) average air fares. Higher population and personal income have a positive effect on demand for air travel, and higher air fares influence demand negatively.

50. The models used by P&D Aviation for the 1994 and 1996 forecasts were tested against actual aviation activity at STIA from 1973 through 1993. The 1994 model showed a 99.6% correlation with domestic passenger variation, and the 1996 model showed 99% correlation. These statistics indicate that the factors used in the P&D forecasting models are excellent in explaining past variations in numbers of passengers at STIA.

51. The forecasts prepared by P&D Aviation were reviewed by the FAA's Northwest Mountain Region. The FAA reviewed the forecasts in terms of the methodology, forecast variables used, statistical measures, and reasonableness of the overall results. The FAA accepted the P&D forecasts and approved their use for the preparation of the EISs.

52. The forecasts were also reviewed by Landrum & Brown, Inc., the prime consultant selected by the Port and the FAA to prepare the Master Plan Update EIS and SEIS. The individual at Landrum & Brown primarily responsible for the review of the forecasts was Douglas F. Goldberg, Vice President and Leader of the firm's Facilities and Operations Practice. Mr. Goldberg has 14 years of experience in aviation and airport planning, has been involved in the planning of over 30 airports in the U.S. and abroad, and has participated in demand forecasts at a variety of major U. S. airports.

53. Mr. Goldberg reviewed the forecasts prepared by P&D Aviation and found them consistent with the industry standard accepted methodology and properly prepared. He testified that the methodology used by P&D Aviation has been used to provide the basis for implementing improvements at most of the major airports throughout the U.S. Landrum & Brown has applied this technique to develop aviation forecasts for many airport clients around the world, including the City of Chicago Department of Aviation and its two primary airports O'Hare and Midway.

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

54. The ACC presented the testimony of economist Dr. Clifford Winston, in support of its challenge to the aviation forecasts. Dr. Winston stated that expanded airport facilities, including a third runway, would themselves cause a growth in demand for air travel. It was his position that, by not taking this factor into account, the STIA forecasts understated the actual demand that will occur once the improvements are constructed.

55. In response to Dr. Winston, the Port presented the testimony of expert Mr. Allison, Mr. Goldberg and Ms. Mary Vigilante, all of whom disagreed with Dr. Winston's positions. The Examiner found the testimony of the Port's witnesses to be credible that aviation demand at STIA is not caused by expanded airport facilities and not constrained by the delay characteristics as STIA, so long as there is sufficient airport capacity to serve the passengers who wish to fly. Thus, aviation demand at STIA can be adequately predicted by using population and income characteristics of the market area, along with air fares. This is particularly true for STIA, because there are no other airports in the region that can meet the demand and because the delays occur during poor weather conditions which are not predictable.

56. Mr. Allison and Mr. Goldberg disagreed with Dr. Winston's position. The Hearing Examiner found the testimony of Mr. Allison and Mr. Goldberg credible that delay at STIA occurs in poor weather conditions and poor weather primarily affects arrivals rather than departures. Because poor weather, particularly on arrivals, is not predictable, the delay is not likely to have a significant impact on travelers' decisions. Moreover, airlines can incorporate delay into their flight schedules and incorporate sophisticated flight consolidation procedures. There are no other airports in the Puget Sound Region that provide an alternative to STIA. Moreover, even with the average delays projected for STIA during the planning horizon, alternative modes of travel (such as automobile travel) will still be considerably longer than air travel. For all these reasons, it is unlikely that reductions in delay at STIA caused by the Master Plan Update will result in substantial additional demand for air travel.

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

57. In response to the ACC's argument that increasing delay at STIA without the project will reduce demand, the Examiner found the testimony of Mr. Goldberg and Mr. Allison to be credible that there will be sufficient capacity at STIA to accommodate passenger demand through the Master Plan Update's planning horizon (beyond the year 2010). That is, through modest adjustments in the number of passengers per airplane and the size of aircraft, as well as the hours of operation, STIA has the capacity to accommodate all the projected passenger demand through the planning horizon. This available capacity at STIA would likely accommodate the demand even as average delays increased, because that has been the experience at other congested airports. Other airports in the U.S. currently operate with levels of delay at or greater than the delay levels projected for STIA beyond 2010. At some of these airports, such as O'Hare, the level of activity is such that the FAA has imposed limits on the number of operations during most of the day. Despite the high levels of delay and the limits on operations, the activity levels at these airports have continued to increase in response to the demand. Therefore, it is not likely that increasing delays at STIA will significantly constrain demand between now and 2010.

58. Dr. Winston hypothesized that an increase of runway capacity and an expansion of terminal and ground transportation facilities would enable the airport to expand the number of aircraft operations. However, as testified to by Mr. Goldberg and as found by the Examiner, the addition of the proposed third runway will not add significant new capacity at STIA during good weather conditions, which occur approximately 56% of the time. The purpose of the new runway is to improve efficiency in poor weather conditions, i.e., to provide two streams of aircraft traffic during poor weather conditions, the same as occurs now in good weather conditions. Because poor weather is not predictable, the addition of capacity in poor weather conditions should not have a significant effect on the demand for air travel.

59. Based on Dr. Winston's testimony, the ACC also argued that expansion of the airport facilities will lead to greater airline competition and reduced operating costs, thereby reducing air

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

fares and inducing more air travel. Again the Examiner found the testimony of the Port's witnesses more credible that the improvements at STIA will not result in greater airline competition because airlines add flights in response to increasing demand not in response to increased airport capacity. STIA already enjoys a high level of airline competition and comparatively lower air fares than the rest of the country. In addition, reduced airline delay costs will not likely result in lower air fares. Savings from delay costs will be partially offset by the airlines' share of the capital improvement expenses. Also, the savings from reduced delay costs, when spread among all airline passengers, represents a small percentage of air fares and will not likely have a major impact on travel demand.

60. Dr. Winston also argued that more efficient and reliable air service would be a stimulant to regional economic growth which, in turn, would generate increased demand for air travel. As the testimony of the Port's witnesses showed, however, for economic growth in a region to be affected by airport improvements, there would have to be a major change from extremely inadequate service to adequate or better service. STIA already provides adequate or better air service, so the STIA improvements will not result in significant new economic growth in the region. In addition, as Mr. Goldberg testified, the EIS aviation forecasts did not assume any constraints in airport capacity, so it would be illogical to include in the forecasts a factor for increased aviation activity resulting from the airport improvements. Also, Mr. Goldberg testified that Denver, which recently constructed a new five-runway modern airport, actually has experienced a decline in the number of passengers and operations following completion of the new airport.

61. Finally, Dr. Winston testified that he developed a model to test whether the addition of a runway fuels growth in aviation demand. Applying his model to the top 150 airports in the country, he concluded that there is a statistical correlation between the number of runways and the amount of aviation activity at an airport. This, he argued, is evidence that an additional runway at STIA would cause additional growth. Again, the Examiner found the testimony of Mr. Allison and Mr. Goldberg more credible on this point. As they testified, Dr. Winston's analysis did not test for a

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

cause and effect relationship and can only show that a correlation exists between airports with high demand and airports with multiple runways. That is, the Winston analysis demonstrated that airports with greater aviation activity generally have more runways than airports with less activity. This does not demonstrate that the additional runways were the cause of greater activity levels, and it could demonstrate nothing more than that busy airports build runways. In addition, the statistical correlation found by Dr. Winston was weak.

62. As Mr. Allison testified, the addition of the second runway at STIA did not result in increased aviation demand. The second runway was built after a period of rapid growth at the airport, but this growth was not sustained after the construction of the runway. The number of passengers grew at an annual average rate of 14.8 percent in the five years before the runway was completed and at an average rate of 3.8 percent in the three years after the runway was completed. A similar pattern occurred with regard to the number of operations. The Examiner found Mr. Allison testimony credible that this is not an unusual occurrence. Airport activity is typically cyclical (reflecting economic cycles), with activity growing rapidly for several years then growing more slowly for several years, and is not dependent on the construction of new runways.

63. The Final EIS included at Appendix R, and the Final SEIS included at Appendix D, analyses of certain "what if" scenarios that respond to the comments that growth in aviation activity might be higher than forecast. In these appendices, the Port considered the possible impacts if added airport capacity results in higher aviation activity. In Appendix D of the SEIS, the Port even considered the potential differences in impacts between (a) a With Project scenario in which operations and enplanements grew at a 10% faster rate than forecasted and (b) a Do Nothing scenario in which it was assumed that the number of operations and enplanements would be limited to their 2010 levels.

64. The ACC asserted that if Dr. Winston's theory is correct, that air pollution and noise would increase with the number of operations. However, increased number of operations under the

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

With Project scenario does not necessarily translate to a comparable increase in air pollution. Eugene R. Peters is a Director with Landrum & Brown. He has over 10 years of environmental planning experience and has conducted the analysis of airport-related activity on regional air quality on airports throughout the country. Mr. Peters provided a detailed analysis in his written testimony that was consistent with the SEIS conclusion that NOx will decrease even as the number of operations increases out to 2010, due to the impact of the reductions in delay which accompany the construction of the 3rd Runway.

65. With respect to noise, the Port presented credible testimony from Mr. Jon Woodward. Mr. Woodward has more than 25 years experience in program design and noise assessment and land use analysis. He has prepared over 1500 noise contour studies in his career. He has worked on noise studies at major airports throughout the country, including Dallas-Ft. Worth, Los Angeles International, Cincinnati, St. Louis, Chicago O'Hare and Toledo. Mr. Woodward was in charge of preparing the noise contours for the EIS. Mr. Woodward corroborated analysis in the EIS which demonstrated the declining size of the 65 DNL noise contours under a do-nothing scenario between 1994 and the year 2010. Despite the anticipated increase in operations at STIA, noise impacts are expected to decline in the future relative to existing conditions. As Mr. Woodward testified, even if the operations forecast projected by Dr. Winston were to occur, the resulting effect would be an expected increase of 7/10 of one decibel (0.7 dBA) on average noise levels. Based on the FAA threshold of significant impact of 1.5 DNL, the 0.7 dBA would not be significant. If any of the current technological initiatives now under way by NASA achieve even 10% of their goals (i.e., one decibel reduction), this would more than offset the increased noise levels associated with the difference in forecasted operations alleged by Dr. Winston.

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

Findings of Fact on the Port and FAA's of Decision To Limit Detailed Analysis in the SEIS to 13 Years (to the Year 2010).

66. At the time the Master Plan Update EIS was prepared in 1994, the airfares nationally and at STIA were relatively stable. Thus, those charged with preparing long-term airport forecasts believed they could consider larger planning horizons than normal.

67. Several factors came together in the time period between the MPU EIS in 1994 and the SEIS in 1996, each of which added significant uncertainty to the planning efforts of those professionals charged with attempting to meaningfully evaluate long-term impacts under SEPA and NEPA. The EIS consultants agreed with the EIS Project Manager Mary Vigilante that these factors made it very difficult to meaningfully evaluate the environmental impacts of the Master Plan Update beyond the year 2010.

68. The testimony of the professionals participating in the SEIS establishes that in various key areas, the SEIS- period of analysis of 13 years falls squarely within the typical range for studies of this type throughout the country. Mr. Peters testified that the air quality studies varied the study period from 5-15 years in the future. In the noise area, Mr. Woodward testified that noise contour studies for new runways typically run on a 10-12 year planning horizon.

69. While the Coalition emphasizes the relationship of the planning period to the anticipated construction date, the runway in the year 2004, a more proper context is to review the length of the planning period from the date of the SEIS in 1996. The planning period evaluated by the Port and FAA was 13 years.

70. One of the principal decision makers in the determination of the planning horizon in SEIS was the EIS Project Manager Mary Vigilante. In addition to extensive airport project management experience, Ms. Vigilante has specialized experience in both air quality and noise analysis fields. She conducted much of the original analysis, as well as the response to comments in

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

all of the project level environmental documents. In addition to the reasons set forth in Appendix D of the SEIS, she testified credibly that there were rapid changes in aviation activity during the mid-1990s at STIA, which made forecasting aviation activity very difficult. Ms. Vigilante and all the experts on the SEIS team concluded that detailed analysis of the years beyond 2010 in the EIS would be speculative and could lead to a substantially inaccurate evaluation of environmental effects. The quantification of project-level environmental impacts is dependent on factors such as total aviation activity, the time of day the activity occurs, the aircraft types, and the engines on the aircraft. Even slight changes in aircraft types and their associated engine types, for instance, can result in substantially different impact analysis. Due to the various volatile factors identified and because aircraft fleet mix and air fares are could not be reasonably predicted beyond 2010, the SEIS concluded that impacts could not be reasonably evaluated beyond this time period, 13 years into the future. Ms. Vigilante also described in detail the different forms of future environmental review, both state and federal, which will analyze possible adverse environmental impacts of the Master Plan Update during the period after 2010.

71. One of the greatest changes following issuance of the Master Plan EIS was the 1996 change in projected airfares announced by the FAA. With respect to the Port's updated aviation demand forecast prepared for the SEIS, after calibrating for local data, this resulted in an 17% increase in the number of operations anticipated at STIA for the year 2010 over the number of operations anticipated under the 1994 Master Plan forecasts. The volatility in projected airfares represented by the FAA's changed airfare projections makes it more difficult to reasonably estimate long-term trends in number of aircraft operations, fleet mix, or day/night operations. Moreover, when the SEIS was prepared, the FAA only estimated airfares to the year 2010 and not beyond.

72. The forecasting uncertainty that surfaced in 1996 significantly changed the ability to analyze long-term forecasts, fleet mix, day/night operations, and created a corresponding uncertainty for the professionals charged with evaluating long-term air quality and noise impacts. This level of

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

uncertainty did not exist two and one-half years earlier, when the Master Plan EIS was being prepared.

73. The preparation of the air quality analysis in the SEIS was the product of collaboration among the three agencies with regulatory authority in this area, the Puget Sound Air Pollution Control Agency ("PSAPCA"), the Washington State Department of Ecology ("DOE") and the U.S. Environmental Protection Agency ("EPA"). DOE retained an independent consultant to assist in detailed review and preparation of comments in its review of the SEIS. All three agencies participated in the air quality analysis which found that the year 2010 was the logical planning horizon for air quality impacts. Although the three agencies had many questions during the process and in their comments on the draft SEIS, all three approved the final air quality analysis contained in the final SEIS.

74. As Mr. Gene Peters testified, the volatility in airfares, forecasts, fleet mix, and other areas in the period following 1994 made it difficult in 1996 to predict with substantial accuracy or to reasonably foresee air quality impacts beyond the year 2010.

75. The uncertainty of long-term airfare projections and the resulting fluctuation in aircraft operation forecasts at STIA added a significant element of uncertainty in the ability of the noise measurement professionals to prepare reliable long-term noise contours in the SEIS. While it is theoretically possible to run noise contours, as testified by the experienced noise professionals Paul Dunholter and Jon Woodward, the reliability of this modeling diminishes significantly as one goes further out in time. Their unrebutted expert testimony was that, while a range of assumptions or alternatives is theoretically possible, the usefulness of such an exercise is questionable because it is not likely to lead to meaningful evaluation.

76. Because of the lack of reliable data beyond the year 2010 to input into the standard noise model (the INM model), the noise professionals in the SEIS limited detailed analysis to thirteen years, because noise impacts analysis beyond that time would be speculative and not likely

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

to lead to meaningful evaluation. In the future, there will be several additional steps of environmental review which will be completed when those impacts are more capable of being meaningfully evaluated. These include Part 150 Noise Compatibility Program, future chapters of the Port's Master Plan Update process, and any future planning and environmental review required under the terms of the FAA Record of Decision

77. The advent of Southwest Airlines to STIA has since 1994 had a significant impact on the fleet mix at the Airport by Southwest and its airline competitors. There has been a significant change from three and four-engine aircraft to medium-sized two-engine jet aircraft. The change in fleet mix translates directly into significant changes in the resulting air pollution emissions. This recent volatility made long term analysis of air quality impacts more difficult in 1996 than in 1994

78. The inability to reasonably forecast aviation demand beyond 2010 made it impossible to reasonably model intersection-by-intersection traffic impacts beyond 2010. In addition, there were also independent changes following issuance of the Master Plan EIS which made meaningful evaluation of surface transportation impacts speculative in and around STIA beyond 2010. The long-term analysis of background surface traffic depends to a large extent of the PSRC's regional model, which was used by traffic expert Jim Edwards and INCA Engineers as the foundation for its analysis of background traffic in the Master Plan EIS and the SEIS. When the SEIS was getting underway, there were three major changes affecting arterials and intersections in the vicinity of STIA, none of which was included in the PSRC model.

79. First, the state's largest public infrastructure project, the Regional Transportation Authority ("RTA") dramatically changed in scope following issuance of the EIS, from a $13 billion project to a $3-4 billion project. This change would radically alter the impact at intersections and arterials in and around STIA after 2010 in ways that could not be fully understood in 1996, because the impacts of this change were not yet known or included in the PSRC model.

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

80. Second, the state highway adjacent to STIA, SR 509, also experienced major planning changes following issuance of the Master Plan EIS. The route and connections for the proposed extension of SR 509 to Interstate 5 was changed. Given its proximity to the Airport, this change would also have very significant impacts on the analysis of traffic intersections in the area after the year 2010. As explained by Mr. Edwards, the specifics of this new proposal was not known in 1996 and was not included in the PSRC traffic model on which INCA relied to conduct its analysis.

81. Third, the City of SeaTac's proposed Personal Rapid Transit system, which was very conceptual in 1994 when the EIS was issued, was two years further into the planning process by 1996. As this was proposed in the jurisdiction surrounding STIA, if constructed it too would have significant impacts on traffic in the area, which impacts were able to be evaluated and not included in the PSRC model.

82. In addition to showing the uncertainties of forecasting project-specific, intersection-by-intersection impacts in 1996 for longer than 13 years, the record reflects numerous examples of ongoing environmental review, to be conducted by the Port and other agencies, of the impacts of the Master Plan Update improvements after the year 2010, at a time when those impacts can be meaningfully analyzed. Those future reviews include:

- Additional Master Plan-related SEPA review by the Port. The Port Director of STIA, Gina Marie Lindsay, testified this process would likely get underway in the next several years,
- The Port's portion of the Part 150 Noise Compatibility Program. While this is a FAA-authorized activity, the testimony outlined the Port's role in approving a plan for FAA consideration. The Port decisions will be subject to SEPA requirements. The scope of this review includes consideration of noise impacts on affected schools. The Port has a well-established track record of conducting Part 150 review at regular intervals, and is currently collecting data for the Part 150 process now underway.

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

- Port Review and Action Mandated by the FAA in its Record of Decision. This will be required prior to 2010 and must include a review of the "adequacy, accuracy, and validity of the final statement." Under the terms of the ROD, "if this review identifies additional significant adverse environmental impacts, the Port will be required to adopt further noise and land use measures designed to minimize any significant adverse effects found in that evaluation."
- Supplemental Environmental Review for Projects Not Underway by June 2000. Because many of the Master Plan Update improvements will not be initiated until after the year 2000, it is likely that a new or updated environmental analysis will occur to cover these projects.
- Air Quality Conformity Review. Air quality conformity is required under state law (although the state is applying the duties of the federal Clean Air Act, which have been delegated to the state and regional agencies.) Under federal law, any action in the Port's Master Plan Update which is not commenced within five years must undergo environmental review again.
- NPDES Permit Renewal Process. Although not directly included in the ACC appeal, the future SEPA review will include consideration of stormwater and water quality impacts associated with the Master Plan Update, as the Port must every five years submit a detailed application for renewal. WAC 173-220-180 (1), (2).

II. CONCLUSIONS OF LAW

Conclusions Relating to the Appeal of the Port Commissioners' Decisions.

1. In Case Nos. 96-2-20357-2KNT and 97-2-13908-2KNT, the Coalition is challenging the legislative decisions of the Port Commissioners adopting Port Resolution 3212 and Port Resolution 3245. The adoption of these two resolutions were legislative decisions reviewable only under a constitutional writ of review.

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

2. Under a constitutional writ, the Court's review is limited to a determination of whether the Port Commissioners' legislative actions were arbitrary and capricious or illegal. Under the arbitrary and capricious standard of review, the Coalition must show that the Port's action was willful and unreasoning, taken without regard to or consideration of the facts and circumstances surrounding the action. An action by an agency is not arbitrary and capricious when there is room for two opinions, even though a reviewing court may believe it to be erroneous, if taken after due consideration.

3. The Coalition claims that the Port has a legal duty under the GMA to comply with each individual comprehensive plan of the Coalition cities. The Coalition relies exclusively on the procedural criteria enacted by the state Department of Community Trade and Economic Development ("CTED") at WAC ch. 365-195 in making this argument. Chapter 36.70A RCW sets forth the planning requirements for cities and counties subject to GMA. The GMA statute does not contain any requirement that port districts comply with local comprehensive plans, and there are no planning or compliance requirements in Chapter 36.70A RCW for special districts, including port districts.

4. For reasons set forth in a separate Memorandum Ruling entered this day, the Court has concluded that even if WAC Ch. 365-195 were read to apply to the Port, its provisions in fact undercut the challenges by the ACC to the Port's actions.

5. In the 1990 legislative session, the Washington Legislature passed a provision for inclusion in Chapter 36.70A RCW that would apply GMA plan consistency requirements to special districts. 1990 Wash. Laws, 1990 1st Ex. Sess. Ch. 17, § 18. This provision explicitly exempted port districts from its requirements. The Governor vetoed this provision, in part because it did not apply GMA plan consistency requirements to port districts. The Legislature had intended that the GMA's requirements not extend to port districts. The Governor's veto does not and cannot act as an affirmative enactment of the philosophy or rationale behind his veto. The Court's decision in this case is therefore based on its reading of the law apart from this legislation and veto.

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

6. Petitioners suggest that the legally binding nature of the CTED procedural criteria is demonstrated by their use by the Growth Management Hearings Board. However, the Board decisions show that the Board has consistently held that the procedural criteria are "purely advisory" and have no regulatory effect. See, West Seattle Defense Fund v. Seattle, CPSGMHB Case No. 96-3-0003 (Final Decision and Order March 24, 1997); Children's Alliance v. Bellevue, CPSGMHB Case No. 95-3-0011 (Order Granting Dispositive Motion); Pilchuck v. Snohomish County, CPSGMHB Case No. 95-3-0047 (Final Decision and Order December 6, 1995).

Conclusions of Law Regarding 47.80.030(3).

7. While the GMA does not contain any legally binding provisions governing port districts as port districts, a portion of the GMA does apply to major transportation projects, irrespective of what type of agency is the project sponsor. In particular, RCW 47.80.030(3) provides that:

> (3) All transportation projects, programs and transportation management measures within the region that have an impact upon regional facilities or services must be consistent with the plan and with the adopted regional growth and transportation strategies.

The "plan" referred to in this case is the Regional Transportation Plan ("RTP") adopted by PSRC. The "adopted regional growth and transportation strategies" in this case refers to the general policies in VISION 2020, also adopted by the PSRC, of which the RTP is a part. Therefore, RCW 47.80.030(3) requires that a project such as the STIA expansion, which is a transportation project with impacts upon regional facilities or services, must be consistent with the RTP and with VISION 2020.

8. The Port's Master Plan Update development actions are consistent with the RTP. Plans for a third runway at STIA are expressly incorporated into the RTP, if the Port agrees to the additional mitigation measures specified by the PSRC. In Resolution 3212, and again in Resolution 3245, the Port committed to those mitigation measures.

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

9. The Court has reviewed the broad, general planning policies of VISION 2020, including the policies regarding the siting of essential public facilities (RF-3 and RF-3.3) although the Court recognizes that these policies are not to be read in isolation from all other applicable policies in VISION 2020. The Court has also thoroughly reviewed the Port decisions in Resolution 3212 and Resolution 3245, including the mitigation committed to by the Port in those resolutions and elsewhere, and the mitigation required under federal law. The Port decisions appropriately considered the range of additional local, state and federal permitting requirements, as authorized by RCW 36.70A.420. The Coalition has not shown that the Port Commissioners' decision violates RCW 47.80.030(3) or is inconsistent with either the RTP or VISION 2020.

10. Based on the record before the Court and the mitigation to which the Port has committed, the Coalition has not met its burden of proving that the Port Commissioners adoption of Resolutions 3212 and 3245 was either arbitrary and capricious or illegal.

Conclusions Regarding the Growth Management Hearings Board Decision.

11. The Court also is reviewing a final decision and order of the Central Puget Sound Growth Management Hearings Board under the Washington Administrative Procedures Act ("APA"). That case is King County Case No. 97-2-22276-1KNT.

12. Under the APA, the Coalition has the burden of proving that (1) the Board erroneously interpreted or applied the law, (2) the GMA Board's FDO is not supported by substantial evidence, or (3) the GMA Board's FDO is arbitrary or capricious. RCW 34.05.570(3).

13. The substantial evidence standard is a deferential standard of review that requires the Court to view the evidence in the light most favorable to the party prevailing in the highest forum that has fact-finding authority. Freeburg v. Seattle, 71 Wn. App. 367, 371, 859 P.2d 610 (1993). The substantial evidence test requires that the Court accept the fact

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

finder's views regarding the weight to be given competing inferences from the evidence. Department of Corrections v. Kennewick, 86 Wn. App. 521, 529-30, 937 P.2d 1119 (1997).

14. On purely legal matters, the Court should give considerable deference to the Board's interpretation of the law, if it is an area in which the Board has special expertise. Northwest Steelhead & Salmon Council v. Department of Fisheries, 78 Wn. App. 778, 786-87, 896 P.2d 1292 (1995); Peter Schroeder Architects v. Bellevue, 83 Wn. App. 188, 191, 920 P.2d 1216 (1996). Because the Board is the expert agency created by the Legislature to determine issues of GMA compliance, the Board's legal interpretation of any ambiguous GMA provisions should be given substantial deference by the Court. King County v. Central Puget Sound Growth Management Hearings Board, ___ Wn. App. ___, 951 P.2d 1151, 1157 (March 2, 1998).

15. Under the arbitrary and capricious standard, the Coalition must show that the challenged agency action was willful and unreasoning, taken without regard to or consideration of the facts and circumstances surrounding the action. Saldin Securities, Inc. v. Snohomish County, 134 Wn.2d 288, 296, 949 P.2d 370 (1998). An action by an agency is not arbitrary and capricious where there is room for two opinions, even if a reviewing court believes it to be erroneous. Abbenhaus v. Yakima, 89 Wn.2d 855, 858-59, 576 P.2d 888 (1978).

16. The Board correctly ruled that the requirements of RCW 36.70A.200(2) apply to all essential public facilities (EPFs), whether or not the EPF was in existence prior to the GMA. The Board also correctly determined that STIA was an EPF subject to the protections granted by RCW 36.70A.200. The GMA refers simply to essential public facilities, which include airports, not to "proposed" or "future" or "new" essential public facilities. This plain language employed in RCW 36.70A.200 provided the GMA Board with no basis for distinguishing between existing and future EPFs

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

17. The Board did not deviate from, or violate, any statutory rule of construction when it decided that RCW 36.70A.200 protects all EPFs, including those existing prior to the enactment of the GMA.

18. The Board's classification of STIA, and its proposed expansion as an EPF, did not require retroactive application of the GMA. Bayless v. Community College Dist. No. XIX, 84 Wn. App. 309, 315, 927 P.2d 254 (1996). The key time for application of RCW 36.70A.300 was not when STIA first came into existence, but when the City of Des Moines amended its GMA plan.

19. The Board properly construed RCW 36.70A.200(2) to prohibit local preclusion of activities necessary to construct and operate an EPF. The legislative purpose of RCW 36.70.200(2) would be defeated if local governments could prevent the siting of an EPF by preventing an activity essential to the EPFs construction or operation.

20. Substantial evidence in the record supports the Board's determinations that (1) fill dirt hauling is essential to the construction of the third runway and (2) trucks hauling fill dirt will have to travel through Des Moines or other adjacent cities to reach the construction site of the third runway.

21. The Board's jurisdiction is limited to deciding whether city and county comprehensive plans and development regulations, as adopted in the abstract, comply with the requirements of the GMA codified in RCW Ch. 36.70A. When comprehensive plan provisions are appealed to the Board, review never relates to any specific project because comprehensive plans have no regulatory effect. Citizens for Mount Vernon v. City of Mount Vernon, 133 Wn.2d 861, 873, 947 P.2d 1208 (1997). In deciding whether comprehensive plan policies and development regulations comply with GMA requirements, the Board necessarily must consider potential consequences based upon the terms and scope of the challenged local enactment.

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

22. The Board's discussion of and findings related to specific activities which are reasonably likely to occur. The Board properly decided that the Des Moines Plan violated RCW 36.70A.200(2). The exact amount of cost or delay did not have to be conclusively established for the GMA Board to determine that the Des Moines Plan policies in question would as drafted be capable of precluding necessary support activities, such as fill dirt hauling, and directly or indirectly stopping construction of the third runway, because the policies at issue in the Des Moines plan unequivocally committed the City to opposing any activity supporting the expansion of STIA. The Board's holding is consistent with the purpose and intent of RCW 36.70A.200, and is not arbitrary or capricious. The Board did not have to wait for that plan to be so applied.

23. The Board properly ruled that because the Des Moines Plan had the effect of making STIA expansion incapable of being accomplished by means at the Port's command, it violated RCW 36.70A.200(2). Under RCW 36.70A.200(2), a city or county is not permitted to "preclude" the siting of an essential public facility. The verb "preclude" means to "render impossible or impracticable." Children's Alliance v. Bellevue, supra. Impracticable is defined as that which cannot be accomplished by the means at the party's command. Merriam Webster's Collegiate Dictionary. The Board properly determined that the Port would be precluded from constructing the third runway because, under numerous Des Moines Plan policies, the Port could not proceed with construction by the means at the Port's command. The Board's holding is consistent with the purpose and intent of RCW 36.70A.200, and is not arbitrary or capricious.

24. Based on the record before the Board, the Board's decision in CPSGMHB case 97-3-0014 was not an error of law, was supported by substantial evidence, and was not arbitrary and capricious.

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

Conclusions Related to the Hearing Examiner Decision that the Master Plan Update EIS and the Master Plan Update SEIS Are Legally Adequate.

General Conclusions Of Law.

25. In Case No. 98-2-04911-1KNT, the Coalition has appealed the Hearing Examiner's decision that the EIS and SEIS are legally adequate. EIS adequacy has been characterized as a question of law. Questions of law generally are subject to a de novo standard of judicial review. Leschi Improvement Council v. Washington State Highway Commission, 84 Wn.2d 271, 280-87, 525 P.2d 774 (1974). However, the de novo standard of review is specifically qualified by SEPA's statutory requirement that agency determinations of EIS adequacy are entitled to substantial weight in administrative and judicial appeals. RCW 43.21C.090. OPAL v. Adams County, 128 Wn. 2d 869, 913 P.2d 793 (1995).

26. The legal standard by which EIS adequacy must be determined is the "rule of reason."

27. Washington courts consistently have articulated the "rule of reason" as a "broad, flexible cost-effectiveness standard." Citizens Alliance v. Auburn, 126 Wn.2d 356, 362, 894 P.2d 1300 (1995). Under this standard, an EIS is not to be a "compendium of every conceivable effect or alternative to a proposed project." Toandos Peninsula Ass'n v. Jefferson County, 32 Wn. App. 473, 483, 648 P.2d 448 (1982). Rather , an EIS is required to include only a "reasonably thorough discussion of the significant aspects of the probable environmental consequences" and provide "sufficient information to make a reasoned decision." OPAL v. Adams County, 128 Wash. 2d at 875; Citizens Alliance v. Auburn, 126 Wash. 2d at 362.

28. Under the "rule of reason," an EIS is not required to identify or analyze impacts that are "remote and speculative." Cheney v. Mountlake Terrace, 87 Wash. 2d 338, 344, 552 P.2d 184 (1986).

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

29. The lead agency's determination that potential environmental impacts are remote or speculative and need not be addressed in an EIS is entitled to substantial weight in an appeal of EIS adequacy. RCW 43.21C.090. OPAL v. Adams County, supra.

30. Under the rule of reason, an agency has broad discretion in deciding what potential mitigation measures should be included in an EIS. SWAP v. Okanogan County, supra; Robertson v. Methow Valley Citizens Coun., 490 U.S. 332, 359, 109 S.Ct. 1835, 104 L.Ed.2d 351 (1989). Neither SEPA nor NEPA require that an EIS include a complete or detailed mitigation plan. Id., 66 Wn. App. at 447.

31. An agency determination of the nature and extent of potential mitigation to include in an EIS is entitled to substantial weight. RCW 43.21C.090. SWAP v. Okanogan County, supra, 66 Wn. App. at 447-448.

Conclusions Of Law Relating to the Aviation Forecast Issue.

32. Washington courts have followed federal NEPA cases when construing similar provisions of SEPA. Eastlake Community Council v. Roanoke Associates, 82 Wn.2d 475, 488 (fn. 5. 513 P.2d 36 (1973).

33. The Port and the FAA are agencies with expertise in forecasting aviation demand and should be granted deference in choosing the appropriate methodology for forecasting aviation activity. City of Grapevine v. Dept. of Transportation, 17 F.3d 1502, 1507 (D.C. Cir. 1994) (court deferred to the agency's expertise in choosing the appropriate way to measure noise); Seattle Community Council Federation v. Federal Aviation Administration, 961 F.2d 829, 833-34 (9th Cir. 1992) ("[I]t is within an agency's discretion to determine which testing methods are most appropriate."); Citizens Against Burlington, 9308 F.2d at 200-201 (FAA's choice of methodology to measure the impacts of noise on the environment was an informed decision to which the court should defer); Sierra Club v. Dept. of Transportation, 753 F.2d 120, 128 (D.C. Cir. 1985) (it is within the expertise and discretion of the FAA to determine the proper method to measure airport noise);

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

Florida Wildlife Federation v. Goldschmidt, 506 F. Supp. 350, 376-77 (1981) (the traffic forecasting methodology used in an EIS was adequate where the modeling was consistent with the state of the art at the time). The United States Supreme Court has agreed that a reviewing court must be its most deferential when examining the decision of an expert agency which is making predictions within its area of special expertise. Baltimore Gas and Electric Co. v. Natural Resources Defense Council, 462 U.S. 87, 103, 76 L.Ed.2d 437, 103 S.Ct. 2246 (1983).

34. When an agency is presented with conflicting expert opinion on an issue, it is the agency's job and not the job of the reviewing appellate body, to resolve those differences. Webb v. Gorsuch, 699 F.2d 157, 160 (4th Cir. 1983).

35. The Port and the FAA used a forecasting methodology for the SEIS that was consistent with industry-accepted standards and proven reliable over time. The Master Plan Update forecasts were reviewed and approved by the FAA's Northwest Mountain Region and the Forecast Branch of the FAA Headquarters in Washington, D.C. The decision to measure aviation demand by the aviation forecast methodology chosen is legally adequate under the rule of reason.

36. Under the rule of reason, the Port and FAA reasonably exercised their discretion in determining that, during the planning horizon for the Master Plan Update, (a) the construction of the proposed improvements, including the third runway, would not cause significant new growth in aviation demand and (b) not constructing the proposed improvements would not cause significant decrease in demand. Therefore, the aviation demand forecasts that served as the basis for the SEIS analysis did not understate aviation activity under the With Project scenario and did not overstate activity under the Do Nothing scenario.

37. The EISs analyzed the potential impacts of a higher aviation forecast and compared these impacts to those of a constrained forecast in Appendix R to the FEIS and Appendix D to the FSEIS. Based on the difficulty to reasonably conduct aviation demand forecasting beyond the year 2010, this analysis was sufficient under the rule of reason.

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

38. The difference of opinion between the ACC's expert witness and the Port's expert witnesses was discussed in the EISs, which allowed the decision-makers to be informed on this issue prior to making their decisions. The lead agency's decision of which expert opinion to follow and which forecasting methodology to adopt was legally sufficient under the rule of reason.

Conclusions of Law Relating to the Lead Agency's Decision to Limit Detailed Environmental Impact Analysis to the 2010 Planning Horizon.

39. Under SEPA, the contents of environmental review depend on the lead agency's existing planning and decision-making process, and on the time when alternatives can be most meaningfully evaluated. WAC 197-11-060(2)(a)

40. SEPA's provisions relating to analyzing the long-term impacts of a proposal over the life-time of the project must be viewed and applied in the context of related SEPA provisions such as WAC 197-11-060(4), which require consideration of impacts that are "likely, not merely speculative."

41. SEPA only requires a reasonably thorough discussion of the probable environmental consequences of an agency's decision. OPAL v. Adams County, 128 Wn.2d 869, 875, 913 P.2d 793 (1996).

42. When discussing potential impacts, an EIS is only required to consider impacts that are "likely, not merely speculative" and remote or speculative impacts need not be discussed. WAC 197-11-060(a); Mentor v. Kitsap County, 22 Wn. App. 285, 289, 588 P.2d 1226 (1978); Cheney v. Mountlake Terrace, 87 Wn.2d 338, 346, 552 P.2d 184 (1976).

43. The decision in the SEIS to limit the detailed analysis of impacts to the 13-year planning horizon, or the year 2010, was a reasonable decision and was legally sufficient under the rule of reason.

44. The conclusion in the SEIS that detailed analysis of environmental impacts beyond the year 2010 would not be capable of meaningful evaluation was a reasonable decision and

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

sufficient under the rule of reason, particularly given the extent to which subsequent environmental review and additional mitigation, if appropriate, would take place under both state and federal processes.

45. The purpose of SEPA was well served with the SEIS. Even though detailed evaluation beyond the year 2010 was speculative and thus not likely to lead to meaningful evaluation, the drafters of the SEIS included at Appendix D an extrapolated estimate of possible impacts in the year 2020 in order to provide decision-makers with the analysis of possible impacts through the year 2020 prior to their taking action. The confirmation in Port Resolution 3245 by the Port Commissioners of the information in the EIS through the year 2020 indicates that this goal was accomplished. Moreover, the discussion of the information contained in the EIS at Attachment A to Resolution No. 3245 shows that SEPA's goal of providing decision-makers with information to ensure an informed decision was well served in this case.

III. ORDER

Based on the foregoing Findings of Fact and Conclusions of Law, and on the Court's Memorandum Ruling on Application of WAC Ch. 365-195, it is ORDERED, ADJUDGED and DECREED as follows:

1. The plaintiffs' claims brought in King County Case No. 96-2-20357-2KNT, in King County Case No. 97-2-13908-2KNT, in King County Case No. 97-2-22276-1KNT, and in King County Case No. 98-2-04911-1KNT should be, and hereby are, DISMISSED WITH PREJUDICE.

/

/

/

/

/

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

2. The Port of Seattle and the Central Puget Sound Growth Management Hearings Board are the prevailing parties in this action and are entitled to costs and attorney fees to the extent provided by law. The prevailing parties shall file a Cost Bill and any other appropriate documentation and briefing related thereto within ten days of receipt of this order.

DATED this 9th day of July, 1998.

HON. ROBERT H. ALSDORF
Superior Court Judge

Judge Robert H. Alsdorf
King County Superior Court
Regional Justice Center
Kent, WA 98032
(206) 205-2620

E

[No. 43100-5-I. Division One. November 15, 1999.]

THE CITY OF DES MOINES, ET AL., *Appellants*, v. THE PUGET SOUND REGIONAL COUNCIL, ET AL., *Respondents*.
THE CITY OF DES MOINES, ET AL., *Appellants*, v. THE PORT OF SEATTLE, ET AL., *Respondents*.
THE CITY OF DES MOINES, *Appellant*, v. CENTRAL PUGET SOUND GROWTH MANAGEMENT HEARINGS BOARD, ET AL., *Respondents*.
THE AIRPORT COMMUNITIES COALITION, ET AL., *Appellants*, v. THE PORT OF SEATTLE, ET AL., *Respondents*.

[Reporter's Note: The following opinion incorporates the Court of Appeals order amending opinion dated February 23, 2000 and supersedes the report of the opinion at 98 Wn. App. 23.]

[1] **Counties — Land Use Controls — Growth Management Act — Regional Transportation Plan — Local Comprehensive Plans — Special Districts — Compliance — Necessity.** When consistency between a local comprehensive plan and a regional transportation plan is achieved after completion of the coordinated planning process mandated by the Growth Management Act (chapters 36.70A and 47.80 RCW), a specific project proposed by a special district within the local jurisdiction must comply with both plans in accordance with state and federal laws.

[2] **Counties — Land Use Controls — Growth Management Act — Essential Public Facilities — Statutory Protection From Local Plans — Expansion.** RCW 36.70A.200(2), which provides that no local comprehensive plan may preclude the siting of essential public facilities, applies to the expansion or improvement of an essential public facility.

[3] **Counties — Land Use Controls — Growth Management Act — Essential Public Facilities — Statutory Protection From Local Plans — Necessary Support Activities.** RCW 36.70A.200(2), which provides that no local comprehensive plan may preclude the siting of essential public facilities, applies to off-site support activities that are necessary to the construction or expansion of an essential public facility.

[4] **Judgment — Collateral Estoppel — Elements — Injustice — Full and Fair Opportunity To Litigate.** The doctrine of collateral estoppel will not bar relitigation of an issue if the party against whom the doctrine is to be asserted did not have a full and fair opportunity in a prior judicial proceeding to litigate the issue.

[5] **Environment — SEPA — Impact Statement — Adequacy — Judicial Review — Administrative Determination — Substantial Weight.** An appellate court engages in a de novo review of the adequacy of an environmental impact statement, giving substantial weight to the governmental agency's determination that the environmental impact statement is adequate.

[6] **Environment — SEPA — Impact Statement — Adequacy — Determination — Rule of Reason — Test.** The adequacy of an environmental impact statement is evaluated under the rule of reason; the rule of reason requires a reasonably thorough discussion of the significant aspects of the probable environmental consequences of the agency's decision.

[7] **Administrative Law — Judicial Review — Deference to Agency — Conflicting Expert Opinions.** A court reviewing an administrative action will defer to an administrative agency's resolution of conflicting expert testimony presented on an issue.

Nature of Action: Several cities surrounding an international airport sought judicial review of growth management hearings board decisions that involved an amendment to a regional transportation plan to include construction of a new runway at the airport. The board had determined that the new runway was an essential public facility, invalidated several provisions of a local plan, and upheld a conclusion by the port district's examiner that the district's environmental studies were adequate.

Superior Court: The Superior Court for King County, No. 96-2-20375-2, Robert H. Alsdorf, J., on July 9, 1998, entered a judgment upholding the board's decisions.

Court of Appeals: Holding that local comprehensive plans could not prevent the port district from conducting off-site dirt-hauling activities that were necessary to construct the new runway, that the port district would be required to comply with the regional transportation plan and the local plans following completion of the coordinated planning process mandated by the Growth Management Act in regard to specific projects in such areas, and that the environmental impact statements were adequate, the court *affirms* the judgment.

Peter J. Kirsch; *John William Hempelmann* (of *Cairncross & Hempelmann, P.S.*); *Gary Neil McLean, Des Moines City Attorney* (*Thomas D. Roth* and *Perry M. Rosen* of *Cutler & Stanfield L.L.P.*, of counsel); *Michael R. Kenyon* and *Robert Franklin Noe* (of *Kenyon Law Firm*); *Londi K.*

Lindell, Federal Way City Attorney; *Wilton S. Viall III*; and *David Todd Hokit* (of *Curran Mendoza, P.S.*), for appellants.

John Tayloe Washburn and *Roger A. Pearce* (of *Foster Pepper & Shefelman P.L.L.C.*); *Linda J.N. Strout*; *Traci Marie Goodwin*; *Christine O. Gregoire, Attorney General*, and *Marjorie Taylor Smitch, Assistant*; and *David Alan Bricklin* and *Jennifer A. Dold* (of *Bricklin & Gendler*), for respondents.

LEXIS Publishing™ Research References

1999 Wash. App. LEXIS 1940

[As amended by order of the Court of Appeals February 23, 2000.]

AGID, J. — This is the second of three actions brought by the cities surrounding the Seattle Tacoma International Airport against the Port of Seattle, the Puget Sound Regional Council, and the City of Sea-Tac—the entities responsible for approving and implementing the Sea-Tac expansion project. All three actions essentially allege "that the GMA [Growth Management Act] requires at least one public entity . . . to ensure that the Sea-Tac expansion project is consistent with the comprehensive plans of neighboring jurisdictions . . . all of which call for the reasonable mitigation of impacts from such a massive project."

In this appeal, which deals solely with the Port's obligations under the GMA and the State Environmental Policy Act (SEPA), the Cities contend that the trial court erred by (1) concluding that neither the GMA nor the Department of Community, Trade and Economic Development regulations require the Port Resolutions to comply with local comprehensive plans, regardless of whether they violate the GMA, (2) upholding the Central Puget Sound Growth Management Hearing Board's invalidation of several provisions of the Des Moines city plan based on the conclusion that they preclude the siting of an essential public facility in violation of RCW 36.70A.200(2), and (3) upholding the Port's and the Federal Aviation Administration's (FAA) SEPA studies, which assume that the expansion will result in no additional passengers or operations and fail to analyze the environmental impacts of the expansion beyond the year 2010. We affirm the trial court.

FACTS

The Port of Seattle is a special district governed by an elected commission and responsible for major marine and air transportation facilities in the Seattle area. In 1993, the Port initiated a Master Plan Update for Sea-Tac, which analyzed alternative means to improve airfield operating capacity in poor weather conditions, one of which was construction of a third runway. In 1995, the Port and the FAA issued a Draft Environmental Impact Statement (DEIS) as required by SEPA, and after public hearings, consultation with numerous agencies, and additional studies, the Port issued a Final EIS which identified the quantity of fill needed for construction of the runway, the various locations where the fill might be obtained, and all routes that might be used to haul the fill. Based on these studies, the Port Commission passed Resolution 3212, which adopted the Master Plan Update and granted approval to develop a third runway at Sea-Tac. Resolution 3212 also contained "a commitment to mitigate the impacts of the improvements at [Sea-Tac] based on the impacts identified in the Master Plan Update EIS."

After publication of the Final EIS (FEIS), the FAA issued its fiscal year 1996 Terminal Area Forecast (TAF) for the nation's airports. The TAF predicted levels of aircraft operations and passengers at Sea-Tac that exceeded the FEIS predictions. In response, the Port and the FAA revised the Sea-Tac aviation demand forecast, concluding that demand could be 17 percent greater than the FEIS forecast. Consequently, the FAA and the Port prepared a Supplemental EIS (SEIS). The draft SEIS, released in February 1997, concluded that detailed impacts could not be meaningfully assessed beyond 2010 for a number of reasons. But the

SEIS did contain a projection of impacts based on assumed steady growth rates to the year 2020, as well as a higher growth rate scenario. Des Moines, Burien, Federal Way, Normandy Park, and Tukwila appealed the adequacy of the EIS/SEIS under SEPA to the Port's Hearings Examiner, who determined that the purposes of SEPA were "well-served" by the Port's studies.

In Port Resolution 3245, the Port Commission reaffirmed Resolution 3212 and included a summary of the Commissioners' decision-making process and an updated and expanded list of mitigation measures. On July 3, 1997, the FAA issued a Record of Decision (ROD) approving the Port's Master Plan Update. The ROD was based on the EIS and SEIS and contained an analysis of the project impacts and a list of FAA-required mitigation. The ROD concluded that " 'all practical means to avoid or minimize environmental harm have been adopted through appropriate mitigation planning.' " On November 24, 1998, the Ninth Circuit upheld that FAA decision, including the aviation demand forecasting and the decision to analyze detailed impacts only through 2010.

Meanwhile, the Port had filed a petition with the Growth Management Hearings Board in February 1997 challenging the Des Moines comprehensive city plan on the theory that it would preclude expansion of Sea-Tac, an essential public facility, in violation of RCW 36.70A.200(2). The Port also asserted that the Des Moines plan was inconsistent with the regional plan, the King County comprehensive plan, and the multicounty planning policies. In an April 20, 1998 order, the Board again stated that the entire Des Moines plan violated RCW 36.70A.200:

> In addition to finding the Plan, as a whole, out of compliance with the requirements of RCW 36.70A.200, the Board found that two policies, 1-04-05 and 5-04-04, substantially interfered with the fulfillment of the GMA's transportation goal, RCW 36.70A.020(3). . . . These policies were invalidated.

The Board remanded the plan and [illegible] Moines to bring the plan into compliance [illegible] and

achieve internal plan consistency. On remand, Des Moines amended only the two invalidated policies. At the hearing after remand, the Board determined that the Des Moines plan was still not in compliance with the GMA, reinstated its invalidity order, and recommended that the Governor impose sanctions on Des Moines if it did not bring its plan into compliance. The Des Moines City Council then amended 15 policy provisions, and the Board found the plan complied with GMA.

The Cities appealed the Board's and the Examiner's decisions to the King County Superior Court, which determined that neither the GMA nor the Department of Community, Trade and Economic Development regulations require the Port to comply with the Des Moines city plans, upheld the GMA Board's determination that several Des Moines plan policy provisions violated the GMA, and affirmed the Port's Hearings Examiner's conclusion that the Port's SEPA studies were adequate.

DISCUSSION

1. The Port's Duty to Comply With Local Plans

The Department of Community, Trade and Economic Development (DCTED), the state agency with the principal responsibility for implementing the GMA, assists counties and cities in preparing comprehensive plans and development regulations[1] and promulgates administrative procedural criteria in the Washington Administrative Code.[2] In WAC 365-195-770(2), DCTED has directed that "[e]xcept where any specific enactment may state the contrary," special districts, such as the Port district, must "comply with the comprehensive plans and development regulations developed under the [GMA]." The Cities contend that "[c]learly, WAC 365-195-770(2) interprets the GMA as setting forth a legal requirement that port districts comply with local comprehensive plans."

[1] *See* RCW 36.70A.190.

[2] *See* ch. 365-195 WAC.

The trial court noted that DCTED regulations apply by their terms only to cities and counties,[3] and that even if the regulations did apply to the Port, they would "require nothing of it" because they are advisory.[4] The court went on to conclude, however, that:

> If plaintiff-petitioners are correct that the [D]CTED regulations provide persuasive authority concerning the application of the GMA to the current conflict . . . [t]he regulations as a whole cannot reasonably be read to support their position that the Port should defer to their comprehensive plan or plans, except in the very limited situation where it is proven that their own plans have been developed in conformity with the GMA. . . . A planning jurisdiction must demonstrate that it has complied with the act, particularly by developing plans in a cooperative fashion and in reasonable conformity to county-wide and RTPO [Regional Transportation Planning Organization] planning.

The court did not determine, as the Cities argue, that "the Port has absolutely no obligation under the GMA to resolve conflicts with local plans." On the contrary, it concluded that if the cities engage in the cooperative planning process required by the GMA and produce plans which reflect this coordinated approach and do not conflict with the Regional Transportation Plan (RTP), the Port should, according to the DCTED regulations, have an affirmative obligation to comply with the terms of these plans.[5] The DCTED regulations and the GMA itself support this conclusion.

[3] RCW 36.70A.040.

[4] WAC 365-195-030 states that "[t]his chapter makes recommendations . . . but compliance with the requirements of the [GMA] can be achieved without using all of the suggestions made here or by adopting other approaches." But because the GMA itself directed DCTED to develop these regulations, they should receive some deference. *See Green River Cmty. Coll. Dist. No. 10 v. Higher Educ. Pers. Bd.*, 107 Wn.2d 427, 438, 730 P.2d 653 (1986) ("a heightened degree of deference is appropriate where the agency's construction of a statute is within the agency's field of expertise").

[5] At the time of this decision, the court was faced with a Des Moines city plan which actively opposed the runway proposal and would have prevented any proposal which would have had a "negative impact" on its residents or businesses. The trial court noted that the "policies at issue in the Des Moines Plan did not require mitigation, but instead directed the City to oppose any new facilities at [Sea-Tac] that increased the impacts to the City of Des Moines."

[1] WAC 365-195-340(2)(b)(iv) provides that "[w]here essential public facilities may be provided by special districts, . . . cities and counties should adopt provisions for consultation to ensure that such districts exercise their powers in a way that does not conflict with the relevant comprehensive plan." In addition, the regulations direct that the "process should provide for a cooperative interjurisdictional approach to siting of essential public facilities of a county-wide, regional, or state-wide nature, consistent with county-wide planning policies."[6] Also, as a proponent of a regional transportation project, the Port is required by RCW 47.80.030(3) to act consistently with the RTP and other regional transportation strategies. As explained in the companion case against the Puget Sound Regional Council, although an RTP may not unilaterally "trump" a city plan, if a conflict between a city plan and an RTP exists after the planning process is completed, the city must revise its plan to comply with the regional plan. *City of Des Moines v. Puget Sound Reg'l Council*, 97 Wn. App. 920, 988 P.2d 993 (1999). After consistency is achieved, the Port will have a duty to comply with both the RTP and the local plans, regardless of whether they require mitigation which the Port finds either difficult or expensive.[7]

2. Application of RCW 36.70A.200(2)

The Cities next contend that RCW 36.70A.200(2), which provides that "[n]o local comprehensive plan or development regulation may preclude the siting of essential public facilities," does not apply to the Sea-Tac expansion. The Cities concede that this provision provides protection from local comprehensive plans that would preclude siting of essential public facilities (EPFs), but they argue that RCW 36.70A.200(2) is inapplicable here because it does not apply to expansions, or to "remote, off-site 'necessary support activities,' " and that the Cities' plan would not have "pre-

[6] WAC 365-195-340(2)(b)(ii).

[7] As urged by the Port in its motion for reconsideration/clarification, we clarify that these duties are limited to Port proposals for specific projects within local jurisdictions in accordance with state and federal law.

cluded" the project. Relying on WAC 365-195-340, which directs that "the broadest view should be taken of what constitutes a public facility," the Board rejected this argument.[8]

Whether RCW 36.70A.200(2) Applies to Improvements or Expansions of EPFs

RCW 36.70A.200(2) states that "[n]o local comprehensive plan or development regulation may preclude the siting of essential public facilities," and RCW 36.70A.200(1) defines essential public facilities as including "those facilities that are typically difficult to site, such as airports." The Cities argue that because this provision makes no mention of "expanding" or "improving" EPFs which have already been sited, neither the Board nor the trial court was authorized to expand the clear terms of the GMA.[9] The Cities also argue that a recent legislative enactment supports its claim that a significant difference exists between construction and expansion. In 1998, seven months after the Board considered this issue, the Legislature enacted House Bill 1487, which added a new section, Section 7, to chapter 47.06 RCW which stated that "[i]mprovements to facilities and services of state-wide significance . . . are essential state public facilities under RCW 36.70A.200." The Cities claim that this amendment supports their argument that prior to this amendment, improvements to airports were *not* considered EPFs.

There are two problems with this argument. First, because of the political controversy generated by the expansion, the bill's co-sponsor explained that the transportation committee had to agree that the amendment would not deal with airports. Thus, the 1998 amendment specifically excludes improvements to airports from the EPF definition,

[8] We accord substantial weight to the Board's findings. *See N.W. Steelhead & Salmon Council of Trout Unlimited v. Dep't of Fisheries*, 78 Wn. App. 778, 786-87, 896 P.2d 1292 (1995).

[9] The Cities point out that the Washington Supreme Court has indicated that the GMA does not "contain the requirement that it be liberally construed." *Skagit Surveyors & Eng'rs v. Friends of Skagit County*, 135 Wn.2d 542, 565, 958 P.2d 962

and this amendment has no bearing on the Sea-Tac expansion. Second, the Cities do not acknowledge the likely possibility that the amendment was a clarification, and not an alteration, of the previous law. As the Washington Supreme Court has noted:

> When an amendment clarifies existing law and where that amendment does not contravene previous constructions of the law, the amendment may be deemed curative, remedial and retroactive. This is particularly so where an amendment is enacted during a controversy regarding the meaning of the law.[10]

If this amendment is a clarification, as the controversy surrounding the issue may suggest, then the Port has a valid argument that HB 1487 simply explains that the Legislature had always intended that improvements to EPFs should be protected under RCW 36.70A.200. Nevertheless, the trial court correctly reasoned that because of the conflicting conclusions that can be drawn from this amendment, "neither the rule of 'expression unius est exclusio alterius' nor the argument that the EPF definition has now been legislatively clarified to include airport improvements" is available to either party.

[2] Deprived of its HB 1487 argument, the Cities are left with a claim that the plain language of RCW 36.70A.200(2) says nothing about "expanding" or "improving" EPFs which have already been sited. But the DCTED regulations, to which the Cities urge this court to defer on other points, indicate that in "the identification of essential public facilities, the broadest view should be taken of what constitutes a public facility."[11] Accordingly, the Board determined that the third runway was an essential public facility. We defer to the Board's interpretation of the law and conclude, as the trial court did, that "the requirements of RCW 36.70A.200(2) apply to all essential public facilities (EPFs),

[10] *Tomlinson v. Clarke*, 118 Wn.2d 498, 510-11, 825 P.2d 706 (1992) (footnotes omitted).

[11] WAC 365-195-340(2)(a)(i).

whether or not the EPF was in existence prior to the GMA." This conclusion comports with the fundamental reasoning behind identifying EPFs and giving them special significance under the GMA—the fact that cities are just as likely to oppose the siting of necessary improvements to public facilities as they are the siting of new EPFs.

Whether EPFs Include "Necessary Support Activities"

[3] The Cities argue that even if the EPF provision applies to the Sea-Tac expansion, the "critical issue" before this court is "whether the trial court and the Growth Board erred in determining that this provision is so expansive so as to cover remote, off-site 'necessary support activities.' " The trial court affirmed the Growth Board's ruling that off-site dirt-hauling activities conducted by the Port within Des Moines are protected under RCW 36.70A.200. The Cities claim that because "support activities" do not appear in the GMA, the Board and the trial court cannot add them. But again, the DCTED regulations urge that an expansive view should be taken of essential public facilities. WAC 365-195-340(2)(a)(i) indicates that identification of EPFs should include "the full range of services" provided both by government and by private entities. In addition, section 340(2)(c) states that no comprehensive plan may "directly or indirectly" preclude the siting of an essential public facility. The legislative purpose of RCW 36.70A.200(2) would be defeated if local governments could prevent the construction or operation of an EPF. Thus, if an activity is indeed "necessary" to a construction of an EPF, a local plan may not stop it from occurring. The Port has convincingly demonstrated that the runway cannot be built without constructing a site that is level with the existing airport, and that this construction will require hauling dirt through the cities surrounding Sea-Tac to the site itself. The Port will undoubtedly be required to mitigate the impacts of this construction on the surrounding communities, but because construction is impossible without these support activities, the Cities cannot stop them from occurring.

The Definition of "Preclude"

To determine the precise meaning of the word "preclude" in RCW 36.70A.200, the Board referred to a previous decision which defined it as "render impossible or impracticable." The Board focused on the word "impracticable," because the Legislature would have used the word "prohibit" instead of "preclude" if it had intended to allow the Cities' plans to fall just short of rendering the siting absolutely impossible. Using *Merriam Webster's Collegiate Dictionary*, the Board defined "impracticable" as "incapable of being performed or accomplished by the means employed or at command." The Board therefore interpreted "preclude" to mean "incapable of being accomplished by the means at the Port's command." The Cities claim that under this "expansive definition," an EPF proponent can "unilaterally control what 'precludes' its project, by claiming that contested comprehensive plan provisions simply would be too costly or time-consuming to comply with." This is not a tenable reading of the Board's decision.

At the time the Board and the trial court considered this issue, the Des Moines plan intended to "oppose" construction of the third runway.[12] Now that the plan has been amended to allow construction, but to require mitigation of its adverse effects, the Cities are correct that the Port will have to comply with the Cities' reasonable permitting and mitigation requirements. The fact that these requirements may make the expansion more costly does not relieve the Port of these obligations.

3. Adequacy of SEPA Analysis

Finally, the Cities contend that the Port's 1997 SEIS violates SEPA because it is premised on the assumption that the expansion will not increase the number of people or aircraft operations at the airport, and because it fails to analyze the effects of the project after the year 2010. The Port argues that the Cities are collaterally estopped from

[12] The trial court indicated that the "record before the Board shows that the City of Des Moines developed and adopted certain comprehensive plan policies and development regulations which would permit it to stop trucks moving fill, and thereby to directly or indirectly prevent [Sea-Tac] expansion."

relitigating this issue because they have already done so in *City of Normandy Park v. Port of Seattle*,[13] an unpublished 1998 Ninth Circuit decision. In that case, the Cities appealed a FAA decision granting final approval to the Port's Master Plan development for the Sea-Tac expansion, arguing that it "improperly relied on a 'no growth' demand model and a limited prediction forecast thereby failing to accurately assess the project's environmental impacts and necessary mitigation measures."[14] The Ninth Circuit analyzed this claim under the federal Airport and Airway Improvement Act (AAIA) and several similar challenges brought against the FAA and concluded that the FAA properly approved the Port's Master Plan.

[4] The collateral estoppel doctrine prevents relitigation of an issue in state court after the party against whom the doctrine is applied has had a full and fair opportunity to litigate his or her case in federal court.[15] But here, the fact that the federal court concluded that the Port's Master Plan satisfied the AAIA has little bearing on the Port's obligations under SEPA because, as the Cities argue, SEPA and the AAIA "have markedly different obligations."[16] The Ninth Circuit analyzed the Cities' claims to determine whether, under the AAIA, "every reasonable step has been taken to minimize the adverse effects"[17] of the expansion and whether the project is consistent with state plans. Although the SEPA inquiry is similar, SEPA requires a more detailed procedural inquiry. The question of the Port's compliance with SEPA therefore requires separate analysis in state court.

SEPA is a procedural statute designed to ensure that local governments consider the environmental and ecological effects of major actions to the fullest extent.[18] SEPA's purpose is to provide decision makers with all relevant information about the potential environmental consequences of their actions and to provide a basis for a reasoned judgment that balances the benefits of a proposed project against its potential adverse effects. An EIS is not to be a "compendium of every conceivable effect or alternative to a proposed project,"[19] but it must include a "'"reasonably thorough discussion of the significant aspects of the probable environmental consequences" of the agency's decision.'"[20]

[5, 6] The Port and the FAA issued their joint Final EIS for the Airport Master Plan Update in February 1996. Later that year, after determining that additional study was necessary based on new forecasts for the nation's airports conducted by the FAA, they issued a Supplemental EIS (SEIS) in February 1997 and a Final Supplemental EIS in May 1997. The Cities alleged that these studies were inadequate because they assumed that the additional runway would not result in an increase of passengers or airport operations and because they did not evaluate the impacts of the expansion beyond the year 2010. After a five-day hearing before the Hearings Examiner, the Examiner concluded that the "purpose of SEPA was well served with this SEIS." We conduct a de novo review of the Examiner's conclusion,[21] qualified by SEPA's statutory requirement

[13] No. 97-70953, 1998 U.S. App. LEXIS 30463, 1998 WL 833628 (9th Cir. Nov. 24, 1998).

[14] 1998 U.S. App. LEXIS 30463, at *3-4, 1998 WL 833628, at *1.

[15] *See Hanson v. City of Snohomish*, 121 Wn.2d 552, 573-74, 852 P.2d 295 (1993) (citing *Standlee v. Smith*, 83 Wn.2d 405, 518 P.2d 721 (1974)).

[16] Substantive differences between two legal schemes do not necessarily preclude application of the collateral estoppel doctrine, *Liberty Bank of Seattle, Inc. v. Henderson*, 75 Wn. App. 546, 548 559-60, 878 P.2d 1259 (1994), *review denied*, 126 Wn.2d 1002 (1995), but when the statutes are sufficiently different that they preclude the full litigation of an issue, applying the doctrine would result in an injustice. *See Southcenter Joint Venture v. Nat'l Democratic Policy Comm.*, 113 Wn.2d 413, 418, 780 P.2d 1282 (1989).

[17] *Normandy Park*, 1998 U.S. App. LEXIS 30463, at *3, 1998 WL 833628, at *1 (quoting 49 U.S.C. § 47106(c)(1)(C)).

[18] *See* RCW 43.21C.030.

[19] *Toandos Peninsula Ass'n v. Jefferson County*, 32 Wn. App. 473, 483, 648 P.2d 448 (1982).

[20] *Org. to Preserve Agric. Lands (OPAL) v. Adams County*, 128 Wn.2d 869, 875, 913 P.2d 793 (1996) (quoting *Weyerhaeuser v. Pierce County*, 124 Wn.2d 26, 38, 873 P.2d 498 (1994)).

[21] *Klickitat County Citizens Against Imported Waste v. Klickitat County*, 122 Wn.2d 619, 632-33, 860 P.2d 390, 860 P.2d 1256 (1993).

that agency determinations of EIS adequacy are entitled to substantial weight.[22] The adequacy of an EIS is assessed under the "rule of reason,"[23] which requires a " 'reasonably thorough discussion of the significant aspects of the probable environmental consequences' of the agency's decision."[24]

"No Growth" Assumption

The Final EIS concluded that regardless of whether the Port took "no action" or whether it constructed the airport expansion, the same number of passengers would use the airport. This forecast was prepared by Stephen Allison, a Senior Aviation Planner for P&D Aviation, the company that prepared the Flight Plan EIS issued by the Port and the Puget Sound Regional Council (PSRC) in 1992. Allison has 30 years of experience in the aviation planning and consulting field and has served as project planner or lead aviation planner on the development of over 30 airport master plans and regional aviation system plans. Preparing forecasts of aviation activity for individual airports and multiple-airport regions is his specialty.

At the hearing, Allison explained that when he prepares a forecast, he develops a detailed mathematical model that assesses the relationship between airport activity and the factors that have been shown to strongly affect it, and then evaluates this model to ensure that it accurately forecasts aviation demand and passes statistical tests. He also considers a wide variety of other factors, including input from the aviation community, the local and national economies, airfares, telecommunications, and aviation demand in the region. He then compares the master plan forecast with forecasts prepared in other studies and by the FAA and evaluates differences in the purpose of the forecast, the forecast approach, and assumptions.

[22] RCW 43.21C.090; *OPAL*, 128 Wn.2d at 875.

[23] *Klickitat*, 122 Wn.2d at 633.

[24] *Id.* (quoting *Cheney v. City of Mountlake Terrace*, 87 Wn.2d 338, 344-45, 552 P.2d 184 (1976)).

In this case, Allison determined that three factors at Sea-Tac have the greatest predictive value for estimating future aviation demand: population of the service area, personal income in that area, and average airfares. The models he developed were tested against historical activity at Sea-Tac with a 99 percent correlation and accepted by the FAA for use in preparation of the EIS/SEIS. The forecasts were also reviewed by Landrum & Brown, the consultant selected by the Port and the FAA to prepare the EIS and SEIS. Other expert testimony at the hearing indicated that Allison's methodology has been used at most of the country's major airports.

The Cities presented the testimony of Dr. Clifford Winston, a Senior Fellow at the Brookings Institution, who stated that expanded airport facilities would cause a growth in demand for air travel. The Port's experts responded that aviation demand is not caused by expanded facilities as long as there is sufficient airport capacity to serve the passengers who wish to fly.

The Examiner found the testimony of the Port's experts credible and concluded that the "Port and the FAA used a forecasting methodology for the SEIS that was consistent with industry-accepted standards and was proven reliable over time. . . . The decision to measure aviation demand by the aviation forecast methodology chosen is legally adequate under the rule of reason." In addition, the Examiner noted that the difference of opinion between the Cities' expert witness and the Port's witnesses was discussed in the EIS, which "allowed the decision-makers to be informed on this issue prior to making their decisions."[25] We agree. Although the conclusion that an expansion at Sea-Tac will not create growth initially appears counterintuitive, the purpose of the expansion is not to increase capacity; it is to decrease delays in poor weather. As such, it is entirely plausible that this expansion will simply improve efficiency, not promote growth.

[25] The Final SEIS included an appendix that analyzed environmental impacts if increased airport capacity did indeed result in higher aviation activity.

The Cities cite several federal cases in support of their argument that the Sea-Tac expansion will cause additional aviation demand. In those cases, however, the courts reasonably held that new freeway exchanges and bridges would spur development and increase growth in the area, which would result in increased traffic on the highways themselves. This does not necessarily hold true for Sea-Tac. Although Sea-Tac will become more efficient when it constructs an extra runway to decrease delays in poor weather, it does not necessarily follow that more people from this region will decide to fly, or that people from other areas will be attracted to Sea-Tac for that reason. As the Eleventh Circuit concluded when considering the impacts of an Atlanta airport runway extension, although an increase in capacity would undoubtedly occur given the projected growth of the region, "[t]his increased growth . . . is not attributable to an extended runway. The effect caused by the runway extension will be a higher percentage of safe landings, not a higher number of planes landing."[26] This reasoning applies here.[27]

[7] The Port and the FAA are agencies with expertise in forecasting aviation demand and should receive deference in choosing the appropriate methodology for forecasting aviation activity.[28] When an agency is presented with conflicting expert opinion on an issue, it is the agency's job, and not the job of the reviewing appellate body, to resolve those differences.[29] We commend the Examiner on his

[26] *C.A.R.E. Now, Inc. v. Fed. Aviation Admin.*, 844 F.2d 1569, 1575 (11th Cir. 1988).

[27] The only airport case the Cities cite involves a multiple-airport system in Washington D.C. *See Citizens for Abatement of Aircraft Noise, Inc. v. Metro. Wash. Airports Auth.*, 718 F. Supp. 974 (D.D.C. 1989) (subsequent history omitted). As the Port points out, passengers in that region have an option, so new gates and terminal expansions may indeed lure passengers away from neighboring airports and increase growth.

[28] *Seattle Cmty. Council Fed'n v. Fed. Aviation Admin.*, 961 F.2d 829, 833-34 (9th Cir. 1992).

[29] *Webb v. Gorsuch*, 699 F.2d 157, 160 (4th Cir. 1983). Washington courts have

thorough analysis of this issue and defer to his finding that the Port's "no growth" presumption was a reasonable forecast.

Decision to Limit Analysis of Future Impacts to 2010

The Port explained to the Examiner that at the time the Master Plan Update EIS was prepared in 1994, airfares at Sea-Tac were relatively stable. Thus, the 1996 EIS analyzed effects of the proposal through 2020. But shortly thereafter several factors combined to add "significant uncertainty to the planning efforts of those professionals charged with attempting to meaningfully evaluate long-term impacts under SEPA and NEPA [National Environmental Protection Act]." Some of these factors included a drop in nationwide airfares, Boeing's decision to discontinue production of the MD-80 aircraft, the arrival of Southwest Airlines, one of the nation's lowest airfare airlines, and "investments in noise and air pollution research which are likely to significantly reduce engine noise in new aircraft . . . starting in the year 2005." In light of these events, the EIS consultants agreed with the project manager that they could not "reasonably forecast" the impacts of the runway project beyond the year 2010.[30] The Cities point out that because the runway will not be completed until 2004 or 2005, the Port has evaluated its actual impacts for only five years. The Examiner disagreed with the Cities' views, concluding that "a more proper context is to review the length of the planning period from the date of the EIS in 1996, rather than the year 2004." Thus, the Examiner viewed the Port's planning period as ranging over 13 years.

WAC 197-11-060(4) explains that "SEPA's procedural provisions require the consideration of 'environmental'

followed federal NEPA cases when construing SEPA. *Eastlake Cmty. Council v. Roanoke Assocs.*, 82 Wn.2d 475, 488 n.5, 513 P.2d 36, 76 A.L.R.3d 360 (1973).

[30] The Port did include an appendix, however, that contained "an extrapolated estimate of possible impacts in the year 2020 in order to provide decision-makers with the analysis of possible impacts through the year 2020 prior to their taking action."

impacts . . . , with attention to impacts that are likely, not merely speculative." This subsection further directs that "[a]gencies shall carefully consider the range of probable impacts, including short-term and long-term effects. Impacts shall include those that are likely to arise or exist over the lifetime of a proposal or, depending on the particular proposal, longer." "Probable" is defined in a later section as "likely or reasonably likely to occur, as in 'a reasonable probability of more than a moderate effect on the quality of the environment' . . . . Probable is used to distinguish likely impacts from those that merely have a possibility of occurring, but are remote or speculative."[31]

Mary Vigilante, the EIS Project Manager, testified that because there were rapid changes in aviation activity during the mid-1980s at Sea-Tac, and because quantification of environmental impacts depends on total aviation activity, aircraft types and engines, and the timing of flights, detailed analysis of the years beyond 2010 in the EIS would be speculative and could lead to a substantially inaccurate evaluation of environmental effects. The Examiner found her testimony credible. Gene Peters, a director with Landrum & Brown, similarly testified that the volatility in airfares, forecasts, fleet mix, and other areas in the period following 1994 made it difficult in 1996 to predict with substantial accuracy impacts beyond the year 2010. As for noise impacts, the experts testified that although it was theoretically possible to run noise contours, the reliability of the models diminishes as the length of time is expanded. The Cities did not rebut this testimony.

The Examiner's determination that this analysis satisfied SEPA's procedural requirements is supported by ample evidence in the record. The fact that the Port included an appendix that estimated the effects of the expansion through the year 2020 based on extrapolated data establishes that the Port did what it reasonably could to provide the decision makers with reliable information about the

[31] WAC 197-11-782.

potential environmental consequences of their actions. Anything more would have been too speculative, and thus the EIS was adequate under SEPA.

Affirmed.

KENNEDY, C.J., and COLEMAN, J., concur.

Reconsideration granted and opinion modified February 23, 2000.

Review denied at 140 Wn.2d 1027 (2000).

[Nos. 18743-8-III; 18747-1-III; 18759-4-III; 18776-4-III; 18809-4-III; 19063-3-III. Division Three. July 3, 2001.]

THE STATE OF WASHINGTON, *Respondent*, v. ARMANDO MAYORGA DESANTIAGO, ET AL., *Appellants*.

[1] **Criminal Law — Evidence — Hearsay — Former Testimony — Governing Law.** The admissibility in a criminal trial of former testimony by an unavailable witness is governed by ER 804(b)(1), ER 804(a), and the limitations imposed by the Sixth Amendment right to confront adverse witnesses.

[2] **Evidence — Hearsay — Unavailability of Declarant — Attempt To Compel Presence — All Available Means — Necessity.** Before a declarant's hearsay statement may be admitted under ER 804(b) (allowing admission of certain statements or testimony when the declarant is unavailable to testify), the State must use all available means to compel the declarant's presence at trial.

[3] **Criminal Law — Evidence — Hearsay — Unavailability of Declarant — Confrontation Clause — Effect.** Hearsay testimony may not be admitted in a criminal trial under ER 804(b) (allowing admission of certain statements or testimony when the declarant is unavailable to testify) unless the more stringent Confrontation Clause standard for unavailability is satisfied.

[4] **Criminal Law — Evidence — Hearsay — Right of Confrontation — Unavailability of Declarant — Good Faith Effort — What Constitutes.** Under the Confrontation Clause, a

F

U.S. Department
of Transportation

**Federal Aviation
Administration**

Northwest Mountain Region
Colorado, Idaho, Montana
Oregon, Utah, Washington,
Wyoming

1601 Lind Avenue, S. W.
Renton, Washington 98055-4056

August 9, 2001

Colonel Ralph Graves, P.E.
District Engineer
U.S. Army Corps of Engineers
Seattle District Office
P.O. Box 3755
Seattle, WA 98124-3766

Dear Colonel Graves:

This is our final follow-up letter to you providing information addressing the issues raised in our May 22nd meeting and your April 30th Memorandum for Record. We apologize for the delay in completing our review and getting our responses to you; however, we believe that the issues needed to be thoroughly addressed given the significance of Seattle-Tacoma International Airport's third runway project to the region. In the course of our review we decided we should validate the data and analyses contained in the Final Environmental Impact Statement (FEIS) and Final Supplemental Environmental Impact Statement (SEIS), through the preparation of a written environmental re-evaluation. This process has now been completed in accordance with our prescribed procedures. As a result, we have concluded that the project continues to conform to the analysis presented in the FEIS/SEIS and the Record of Decision issued on July 3, 1997.

There are actually two written reevaluations, as well as a new Record of Decision. The first re-evaluation considers changes in forecast aviation activity levels and changes to the master plan update projects. It assesses the environmental consequences of the changes on noise and land use, air quality, and surface traffic. It identifies no significant change in the impacts reported previously. The second re-evaluation reviews the new biological information that has arisen in the last four years, including information on wetlands, endangered and candidate species, commercially managed fish species, and migratory birds. It also determines there is no significant changed environmental impact.

Your Memorandum for Record asks specifically about potential changed air quality impacts. In addition to the review described in the written re-evaluation, we have obtained a commitment from the Port of Seattle to annually demonstrate compliance with

de-minimis threshold levels. This commitment will be a condition of grants for the master plan update improvements.

As a result of these written re-evaluations, we have concluded that the recent MPU project modifications and the new information concerning environmental impacts do not warrant preparation of a new SEIS. The enclosed Record of Decision, to which the re-evaluations are appended, describes the analyses and conclusions. We hope this information addresses your questions and concerns with respect to these issues. If you have any further questions, do not hesitate to contact our office.

Sincerely,

Lowell H. Johnson
Manager, Airports Division
Northwest Mountain Region

cc:
Muffy Walker, COE Regulatory Branch
bcc:
ANM-610
SEA-ADO

U.S. DEPARTMENT OF TRANSPORTATION

FEDERAL AVIATION ADMINISTRATION

NORTHWEST MOUNTAIN REGION

RECORD OF DECISION

ENVIRONMENTAL REEVALUATION FOR MASTER PLAN UPDATE DEVELOPMENT ACTIONS SEA-TAC INTERNATIONAL AIRPORT

AUGUST 8, 2001

INTRODUCTION AND BACKGROUND

Four years ago, on July 3, 1997, I signed a Record of Decision (ROD) approving Federal Aviation Administration (FAA) actions providing support for various Master Plan Update (MPU) development actions proposed by the Port of Seattle (POS), including a controversial third runway project. The 1997 ROD relied upon a Final Environmental Impact Statement (FEIS) approved by the FAA on February 1, 1996, and a Supplemental EIS (SEIS) approved by the FAA on May 13, 1997. The instant year-2001 ROD makes the determination that it is not necessary to further supplement the 1996 and 1997 EIS documents at this time, to account for subsequent refinements to the MPU projects and new information relating to environmental impacts of these projects.

It is not uncommon during airport design and development, in the period between initial FAA approval of federal actions supporting airport projects and the completion of those projects, for new environmental information to come to the attention of the FAA. Likewise, it is not uncommon for an airport sponsor to propose and make design refinements to previously-approved projects as those projects proceed towards the construction phase. This is particularly true when the airport development plan involves multiple separate projects proposed to be completed in several stages over a lengthy period of time.

At 40 CFR Part 1500, the Council on Environmental Quality (CEQ) has promulgated regulations for implementing the procedural provisions of the National Environmental Policy Act. Section 1501.9(c)(1) provides that an agency shall prepare supplements to final environmental impact statements if:

> (i) The agency makes substantial changes to the proposed action that are relevant to environmental concerns; or
>
> (ii) There are significant new circumstances or information relevant to environmental concerns and bearing upon the proposed action or its impacts.

The FAA Northwest Mountain Region Airports Division has prepared and signed two environmental reevaluations[1]. The ROD Appendices A and B address the issue of whether the previous environmental analyses, pertinent to ongoing discretionary federal actions concerning the POS MPU projects, must now be supplemented based upon new information concerning these projects or recent modifications to these projects.

The Appendix A reevaluation examines the validity of the FSEIS in light of increased airport activity levels and MPU project refinements that have occurred in the 4 years since issuance of the 1997 FSEIS and ROD.

Appendix A discusses increased airport activity levels that have occurred and have been forecast since the 1997 FSEIS forecasts, noting that the environmental consequences of these activity levels have the potential to affect aircraft noise and land use, air quality, and surface traffic conditions. While reporting that since 1997 airport operations have been somewhat greater than forecast in the FSEIS, Appendix A concludes: 1) that the noise mitigation commitments in the ROD would fully mitigate any noise impacts exceeding those forecast in the FSEIS, 2) that the MPU projects will continue to comply with the de-minimus thresholds of the Clean Air Act conformity regulations, as stated in the FSEIS, and 3) that the increased passenger levels will not significantly degrade surface traffic conditions to an extent undisclosed in the FSEIS.

Appendix A also discusses various refinements to the MPU projects that have been identified over the last 4 years. When considering the overall context and intensity of these refinements, it is concluded that none of these modifications are expected to cause significant adverse impacts, either individually or in combination.

The Appendix B reevaluation discusses new biological information that has arisen in the 4 years since issuance of the 1997 FSEIS and ROD, including new information on wetlands, endangered and candidate species, commercially managed fish species, and migratory birds.

With regard to wetlands, Appendix B concludes that despite an increase in the acreage of wetlands now known to be

---

[1] Re-Evaluation of Airport Activity and Changes to the Master Plan Update at Seattle-Tacoma International Airport, dated July 2001, attached as Appendix "A"; and Re-Evaluation of Impacts to Biological Conditions from the Master Plan Update Improvements at Seattle-Tacoma International Airport, dated July 2001, attached as exhibit "B."

affected, the functions and values of the affected wetlands are the same as those analyzed and evaluated in the FEIS and FSEIS, with no additional or unrecognized biological functions identified.

With regard to the Endangered Species Act (ESA), Appendix B addresses the fact that on March 24, 1999, and November 1, 1999, the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Services (USFWS), [the Services], respectively listed the Puget Sound Chinook salmon and the Puget Sound bull trout as threatened species under the ESA. Critical habitat for the Puget Sound Chinook salmon was designated in February 2000.

On May 22, 2001, following a year-long consultation process, the USFWS issued a biological opinion (BO) concluding that the MPU development actions are not likely to jeopardize the continued existence of the bull trout, bald eagle or marbled murrelet. On May 31, 2001, the NMFS issued a letter concurring with the BA conclusions that the MPU development actions are not likely to adversely affect the Puget Sound Chinook salmon or result in the destruction or adverse modification of its critical habitat. Under ESA Section 7, and its implementing regulations, the FAA's formal consultation with the Services was concluded at the issuance of these two documents.

Appendix B starts with the premise that these new listings of threatened fish species by the Services represent determinations of the species' legal status, and do not by themselves constitute significant new information requiring preparation of another SEIS. The written reevaluation notes that the 1996 and 1997 EIS and SEIS specifically considered the effects of the project upon fisheries and aquatic resources in the project vicinity, including anadromous fish. The reevaluation specifically relies upon the expertise of the Services, and, likewise, concludes that the MPU development actions are not likely to jeopardize the continued existence of newly ESA-protected fish species or result in the destruction or adverse modification of their designated critical habitat. The reevaluation documents the fact that the MPU projects' environmental effects resulting from the ESA listings are neither significant nor uncertain, as compared with the impacts evaluated in 1996 and 1997.

With regard to the bald eagle, the USFWS's BO and Appendix B agree with the FEIS and FSEIS assessment that the MPU projects are not expected to adversely affect this threatened species. For the Marbled Murrelet, the BO found insignificant effects, given the absence of nearby critical

habitat, a conclusion similar to that reached in the FEIS and FSEIS, where it was found that the murrelet is not likely to occur in the project area.

With regard to coho salmon, an ESA-candidate species, Appendix B concludes that, while there may be temporary adverse affects on coho during MPU construction, long-term benefits to coho are expected as a result of in-basin mitigation efforts. Appendix B notes that these effects are consistent with the effects from potential construction and operational activities described in the FEIS and FSEIS for similar fish species.

With regard to commercially managed fish species and their essential fish habitat protected by the Magnuson-Stevens Act, as amended by the Sustainable Fisheries Act, Appendix B concludes that construction and operation of the MPU projects would have no effect upon Coastal Pelagic Fisheries or West Coast Groundfish, and that, even though these projects may adversely affect coho essential fish habitat over the short term, over the long term they would have an overall beneficial affect. These effects are likewise consistent with the effects from potential construction and operational activities described in the FEIS and FSEIS for other fish species.

With regard to species protected under the Migratory Bird Treaty Act, Appendix B notes that project impacts upon bird species were thoroughly discussed in the FEIS and FSEIS, and concludes that new information in this area is consistent with the FEIS and FSEIS findings that the MPU projects would not have a significant adverse effect upon migratory birds. Neither the legal status of these species under federal law nor their biological status has changed over the last 4 years.

DECISION AND ORDER

Given the project modifications and new information discussed in Appendices A and B, the decision choices available for the FAA are either to refrain from further FAA actions, pending preparation of a SEIS, or to continue with those actions without preparing another SEIS.

Having thoroughly reviewed the Appendix A and B reevaluation documents, along with pertinent portions of the documents they reference, I have concluded that the recent MPU project modifications and the new information concerning environmental impacts do not affect the quality of the human environment in a significant manner or to a significant

extent not already considered. I have, therefore, concluded that there is no significant new information warranting preparation of new SEIS.

I have further determined that the certification prescribed by 49 U.S.C. § 44502(b), that the projects approved in the July 3, 1997, ROD are reasonably necessary for use in air commerce, along with the subsidiary orders and determinations therein, will neither be reconsidered, nor their effectiveness stayed, for further environmental review.

Therefore, under the authority delegated to me by the Administrator of the FAA, I find that the preparation of another SEIS is not warranted at this time, and I direct that the FAA continue to implement the agency actions/approvals specified in Section III of the 1997 ROD, without further NEPA documentation or supplementation.

L. Andriesen

Lawrence B. Andriesen
Regional Administrator
Northwest Mountain Region
Federal Aviation Administration

8-8-01
Date

RIGHT OF APPEAL

This decision constitutes the Federal approval for the actions identified above and any subsequent actions approving Federal funding for the Port of Seattle. Today's decision is made pursuant to 49 U.S.C. Subtitle VII, Parts A and B, and constitutes a Final Order of the Administrator, subject to review by the courts of appeals of the United States in accordance with the provisions of 49 U.S.C. § 46110.

APPENDIX A

RE-EVALUATION OF AIRPORT ACTIVITY AND CHANGES TO THE MASTER PLAN UPDATE

AT

SEATTLE-TACOMA INTERNATIONAL AIRPORT

July 20, 2001

RE-EVALUATION OF AIRPORT ACTIVITY AND

CHANGES TO THE MASTER PLAN UPDATE

AT SEATTLE-TACOMA INTERNATIONAL AIRPORT

TABLE OF CONTENTS

I. BACKGROUND AND NEED FOR REEVALUATION 1

A. Steps Toward Implementation Since July 3, 1997 1

B. Need for Written Reevaluation 2

II. ISSUES RELATING TO CONTINUED VALIDITY OF FINAL SUPPLEMENTAL EIS 3

A. Activity Levels 4

1. Background and Current Situation 4
2. Environmental Consequences 11

B. Modifications to the Master Plan Update Project 18

C. Cumulative Impacts of Project Modifications and Changes in the Surrounding Environs 18

III. CONCLUSION 19

ATTACHMENT A - NEPA Consideration of Other Port Projects A-1

I. BACKGROUND AND NEED FOR RE-EVALUATION

On May 13, 1997, the FAA approved the *Final Supplemental Environmental Impact Statement (Final Supplemental EIS) for the Proposed Master Plan Update Development Actions at Seattle-Tacoma International Airport.* The SEIS supplemented the Final Environmental Impact Statement dated February 9, 1996 (FEIS). A Record of Decision (ROD) was subsequently signed on July 3, 1997, providing final approval for those FAA actions necessary to support the proposed Master Plan Update projects. The Master Plan environmental documents describe four needs at the Airport and the corresponding actions necessary to satisfy those needs: 1) a third runway (a new 8500-foot dependent air carrier runway), 2) a 600-foot southerly extension of existing Runway 16L/34R, 3) expanded runway safety areas for Runways 16R and 16L, and 4) certain terminal and landside improvements scheduled to be completed through the year 2010.

FAA Order 5050.4A Paragraph 102 establishes time limitations for environmental impact statements. Among other provisions, subparagraph 102b states with respect to Final EIS's:

> If major steps toward implementation of the proposed action (such as the start of construction, substantial acquisition, or relocation activities) have not commenced within 3 years from the date of approval of the final statement, a written reevaluation of the adequacy, accuracy and validity of the final statement shall be prepared. If there have been significant changes in the proposed action, the affected environment, anticipated impacts, or proposed mitigation measures, a new or supplemental environmental impact statement shall be prepared and circulated.

A Written Reevaluation is not required if "major steps toward implementation of the proposed action" have occurred. Steps considered "major" under Order 5050.4A "Airport Environmental Handbook" include start of construction, substantial acquisition, or relocation activities. The FAA has reviewed the actions taken by the Port of Seattle (Port), the owner and operator of the Airport, to implement the projects included within the approvals in the Final Supplemental EIS and the ROD. The following summarize those actions:

A. Steps Toward Implementation Since July 3, 1997.

Between July 3, 1997 and June 1, 2001, the Port has acquired about 240 acres of land to implement the Third Runway and associated projects (including Taxiway C, connecting taxiways, taxiway filets), at a total cost of $143 million; 319 residential units have been demolished and 34 moved off-site, and all occupants of 483 residences have been relocated to other dwellings. The cost of demolition and relocation for the runway since July 3, 1997 total $3.7 million. Approximately 95% of the property to be acquired for the project has been acquired and about 3 million cubic yards of earth fill material has been acquired and deposited at the Airport for the Third Runway embankment at a cost of $48 million. This fill constitutes approximately 20% of the total fill required for the runway. Of these amounts, approximately $46.7 million was funded by FAA grants.

Virtually all of these steps would be of little or no value to the Port, or to the national air transportation system, if the runway and associated projects are not completed and operational.

In addition, construction on the following elements of the terminal and landside projects have been initiated: the southern expansion of the main parking garage; expansion of the main terminal, improvements to the main garage and garage access, expansion of the A Concourse, completion of the new North Employee Parking Lot, completion of aircraft parking hardstands in the cargo area, infrastructure in anticipation of other planned improvements, etc. The cost of this construction between July 3, 1997 and the date of this document is approximately $365,000,000.

In total, the Port has expended about $498 million of the total $2.6 billion Master Plan Update projects. The Port has acquired almost all of the land required for the project at substantial cost, has cleared the land and relocated the residents. The Port has moved approximately 20% of the total fill needed for the runway and has already constructed elements of the airfield improvements that will serve the new runway. Such steps toward implementation are "major" and sufficient under Paragraph 102b to make a Written Reevaluation unnecessary.

B. Need for Written Reevaluation

Paragraph 103 of FAA Order 5050.4A states:

> "In addition to the requirement for a written reevaluation due to circumstances arising under paragraph 102, the responsible official should exercise judgment on when a written reevaluation is appropriate in other circumstances to evaluate the continued validity of an environmental document. The preparation of a new EIS, FONSI, or supplement is not necessary when it can be documented that: the proposed action conforms to plans or projects for which a prior EIS or FONSI has been filed; the data and analysis contained in the previous EIS or FONSI are still substantially valid; and that all pertinent conditions and requirements of the prior approval have been or will be met in the current action."

The FAA has continued to monitor the progress of the Port of Seattle development through regular interactions at levels ranging from monthly coordination meetings, site visits, and project specific coordination, to reviews of materials submitted by the Port of Seattle. The FAA has reviewed the data, analysis and conditions presented in the FEIS and FSEIS and found them to remain substantially valid. Further, changes in proposed development projects at Sea-Tac conform to the Master Plan Update, upon which the Final EIS and FSEIS were prepared. Further, the Port has continued to meet all pertinent conditions and requirements noted in the FAA's ROD.

The FAA concludes that under the standards of paragraph 103 of Order 5050.4A, a Written Reevaluation is not required.

Upon gaining access to acquired lands where previous requests for access had been denied, the Port identified additional wetlands that would be affected by the proposed project. While the number of wetlands affected has increased over that which was presented in the Final EIS and FSEIS, the conclusions regarding the impact of the project on wetland resources remains substantially valid. As is documented in the FAA's re-evaluation concerning biological issues, the wetland impact analysis presented in the Final EIS and FSEIS remain substantially valid.

Nevertheless, the FAA has prepared this Written Reevaluation. The FAA is aware that the Master Plan Update projects are highly controversial in some communities near the Airport. Although the City of SeaTac, in which the Airport is located, has accepted the Master Plan Update projects, certain other units of government near the Airport have not, and continue to oppose these projects. In light of this controversy, the FAA has elected to prepare this document.

* * *

It is important to note that the Council of Environmental Quality's (CEQ) "NEPA's Forty Most Asked Questions" response to question 32 contains further clarification on NEPA's intent relative to Supplements to old EISs:

> "As a rule of thumb, if the proposal has not yet been implemented, or if the EIS concerns an ongoing program, EISs that are more than 5 years old should be carefully reexamined to determine if the criteria in Section 1502.9 compel preparation of an EIS supplement.
>
> If an agency has made a substantial change in a proposed action that is relevant to environmental concerns, or if there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts, a supplemental EIS must be prepared for an old EIS so that the agency has the best possible information to make any necessary substantive changes in its decisions regarding the proposal. Section 1502.9(c)."

This Written Reevaluation has been prepared because more than three years have elapsed since the Final Supplemental EIS was approved, per FAA Order 5050.4A, but not more than the five years noted by CEQ. This Reevaluation evaluates the current validity of the Final EIS and Final SEIS in light of subsequent events and current conditions, all as provided in Order 5050.4A.

II. ISSUES RELATING TO CONTINUED VALIDITY OF FINAL SUPPLEMENTAL EIS

The FAA has re-evaluated the adequacy, accuracy and validity of the FEIS/SEIS. The question in this document is whether any new information significantly affects the analysis of environmental impacts of the projects. With the passage of time, it is to be expected that some of the data in an EIS will not match subsequent actual experience exactly, and that new information will become available. That is true with respect to the FEIS/SEIS. However, the questions are whether the new information or changes in the project would significantly change the kind or extent of environmental impacts, and whether new or different mitigation of environmental impacts would be required. If the environmental impacts of the projects would not be significantly different in light of new information, there is no reason to undertake a supplemental EIS.

The FAA has re-evaluated the validity of the Final Supplemental EIS in light of the following events and circumstances that have occurred since the Final Supplemental EIS was issued in May 1997:

A. Variance between actual activity levels at the Airport and the levels forecast in the Final Supplemental EIS. In addition, the implications of the 2000 Terminal Area Forecast (TAF) were considered;

B. Modifications to the Master Plan Update projects; and

C. Information regarding cumulative impacts.

The FAA has reviewed each of these issues to determine whether it would require a new or supplemental EIS.

A. Activity Levels

A primary reason that the FAA prepared the 1997 Supplemental EIS was the rapid growth in air travel demand that had been experienced at Sea-Tac Airport during the 1990s. As a result, the FAA examined how actual activity at the Airport has occurred in comparison with the Master Plan Update forecasts, as well as more recent forecasts prepared by the agency.

1. Background and Current Situation

a) Master Plan Update Activity Levels

The Final Supplemental EIS used the following forecasts of future activity at the Airport for 2000, 2005, and 2010:

TABLE 1

COMPARISON OF FSEIS DO-NOTHING TO "WITH PROJECT" ACTIVITY LEVELS

Primary Forecast

	Total Passengers		Total Operations	
Year	Do Nothing	With Project	Do-Nothing	With Project
2000	27,400,000	27,400,000	409,000	409,000
2005	31,400,000	31,400,000	445,000	445,000
2010	35,800,000	35,800,000	460,000	474,000

Source: Final Supplemental EIS, Page 2-14

Contingency Forecasts (Final Supplemental EIS Appendix D)

	Total Passengers		Total Operations	
Year	Case 1	Case 3	Case 1	Case 3
2010	35,800,000	35,800,000	474,000	521,400
2020	44,600,000	49,060,000	532,000	585,200

Appendix D, Final Supplemental EIS, With Project activity.

The Final Supplemental EIS Appendix D also contained supplemental estimates of environmental impacts for purposes of considering the environmental consequences

of a contingency forecast. That Appendix recited the difficulty of making reliable forecasts for future years, particularly for distant years. It is particularly difficult to assign a specific activity level to particular future years. Although an airport may be expected to reach particular forecast levels eventually, it is difficult to predict the precise year in which that will occur. As a result, FAA's guidance on performing forecasts (as will be noted in the following section) suggests that airport planning focus on future activity levels rather than particular future years.

In light of the fact that a Supplemental EIS was being prepared because activity had varied over earlier predictions, and that activity is difficult to accurately predict, the appendix was prepared to contain a "what if" the new forecasts were also less than actual. Three cases were examined. Case 1 reflected the Supplemental EIS forecasts, with a linear extrapolation through 2020. Case 2 reflected a 10% increase in each respective year over the Supplemental EIS forecasts. Case 3 was the same as Case 2, but in the case of the Do-Nothing, assumed that the terminal and landside facilities could not accommodate the passenger demand beyond 2010.

b) Recent Actual Levels and the FAA's Terminal Area Forecast (TAF)

Since the Final Supplemental EIS, the Airport has experienced operations that are somewhat greater than expected in the primary forecasts. For 2000, the Airport handled 446,066 operations, the operations total expected by the Final Supplemental EIS to initially occur in 2005. Passenger enplanements, however, have not grown as fast as operations. In 2000, the Airport accommodated 28.4 million passengers. The Final Supplemental EIS enplanements forecasts are generally consistent with the actual experience at the Airport in the intervening years, as the FSEIS evaluated 27.4 Million annual passengers (MAP) versus actual of 28.4 MAP. The difference between the growth rate for the number of passengers and aircraft operations appears as a result of how the airlines are responding to the growth in passenger demand – by providing more frequent service with smaller aircraft.

The FAA has continued to issue annual updates of its Terminal Area Forecasts (TAF), as was acknowledged in the Final EIS and Final Supplemental EIS. The TAF is prepared using different methods than the Master Plan Update forecasts, and the Final Supplemental EIS explains why the Master Plan Update forecasts were considered by the FAA to be more appropriate than the TAF for purposes of that environmental impact analysis. The Master Plan Update Final Supplemental EIS forecasts relied more heavily on actual local conditions, whereas the TAF relied more heavily on national trends, with the result that the Master Plan Update forecasts were somewhat lower than the TAF forecasts.

In preparing this evaluation, the FAA considered the most recent actual activity levels as well as the most recent (2000) Terminal Area Forecast. These are as follows:

Year	Total Passengers	Aircraft Operations
1999 Actual	27,700,000	434,425
2000 Actual	28,400,000	446,066
TAF 2005	33,805,000	485,740
TAF 2010	39,746,000	529,060
TAF 2015	45,687,000	572,400

Actual: Port of Seattle, TAF Downloaded from the Internet on 1-13-01

When considering the need to supplement the FSEIS, the FAA has compared the year 2000 TAF with the 1996 TAF that formed the basis for determining the need to prepare the FSEIS. This comparison shows:

Year	2000 TAF		1996 TAF	
	Total Passengers	Aircraft Operations	Total Passengers	Aircraft Operations
1999 Actual	27,700,000	434,425		
2000	28,400,000	446,066	27,840,000	433,474
TAF 2005	33,805,000	485,740	32,580,000	468,053
TAF 2010	39,746,000	529,060	37,900,000	528,205
TAF 2015	45,687,000	572,400	NA	NA

For the year 2010, the two TAFs are less than 0.2% different (855 operations) from an aircraft operations perspective and less than 5% from a total passenger perspective. In 2005, the passenger difference is less than in 2010, while the operations differ by 3.8%. These differences are very small, particularly in the most distant future (2010), the FAA finds that there is not a significant difference between the two TAF forecasts.

During the preparation of this re-evaluation document, the FAA began internal coordination of the 2001 TAF. As part of the initial review, the FAA Washington DC office distributed national information to its local offices and seeks feedback. The initial data set for Sea-Tac indicates that the 2001 TAF will likely use lower growth rates (2000 TAF used 1.8% whereas the 2001 TAF may use 1.58%) than were used in the 2000 TAF. As a result, the TAF projection of 572,400 annual operations in 2015 may be lowered to 562,500 in the 2001 TAF. The 2001 TAF would reflect the slower economic conditions now affecting the country.

The FAA has reviewed the Final Supplemental EIS explanations of the differences between its forecasts and the TAF and has concluded that the same conditions continue to exist. The TAF is a useful guide to projected airport activity, but is not adjusted to the specific conditions at the Airport. The FAA continues to consider the local forecasts more specifically applicable to the Airport for environmental impact analysis purposes.

Further, the 2000 TAF was prepared in mid 2000, based on conditions preceding that period. Since that time, national and local economic conditions have begun to slow. As a result, activity at Sea-Tac has also begun to slow such that growth in aircraft operations and passenger activity has declined and leveled-off. During the first five months of 2001, air travel activity has been less than 2000. Even accounting for the effect of the February 28, 2001 earthquake in Seattle, which for a short period severely affected the control tower and ability to process arriving and departing operations, total passengers and operations are less than the comparable periods in 2000.

As was noted in the FSEIS, the quantity of air travel demand is based on population, per capita income, and the cost of air travel. Both the cost of air travel and per capita income have been affected by recent economic conditions – the cost of fuel has increased substantially and the availability of discretionary income has decreased.

FAA believes that it is reasonable to use locally developed forecasts for purposes of environmental evaluations of specific local improvements. As has not been

uncommon in the past, 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. Therefore, the FAA does not place any additional weight on the 2000 TAF in comparison to the 1996 FSEIS forecasts; particularly since the 1996 TAF (upon which the need to prepare the FSEIS is based) and 2000 TAF are very similar, as noted earlier. However, to aid in understanding the probable environmental consequences of these forecasts, this written re-evaluation discusses (in "2. Environmental Consequences") the probable impact of the 2000 TAF.

c) Other Issues

Table 2 contrasts the current (2000) TAF with the Master Plan forecast as well as the contingency analysis presented in Appendix D of the Final Supplemental EIS. While the FAA's terminal area forecast is greater than was considered in evaluating the Master Plan forecast, it is lower than the contingency analysis presented in Appendix D through 2005. Post 2005, the TAF is slightly greater than the contingency forecast.

As **Table 2** shows, the difference in aircraft operations between the 2000 TAF and the Master Plan Update forecast is less than the difference between the Appendix D comparison against the forecast; the TAF activity level is embraced generally by the Case 3 analysis.

After comparing the two activity level projections, several issues were considered:

- FAA Guidance on Forecast Comparisons
- Capability of the existing airfield
- Activity and Capacity with the Third Runway
- Forecasting beyond a 10 year period

TABLE 2
Comparison of TAF, Master Plan and Final Supplemental EIS Contingency Forecasts

Year	*2000 TAF*	*Master Plan Update Forecast*	*Contingency FSEIS Appendix D Case 1*	TAF compared to Forecast (Case 1)	*Contingency FSEIS Appendix D Case 3*	TAF compared to Contingency Forecast (Case 3)
2000	442,420	409,000	409,000	33,420	449,900	-7,480
2005	485,740	445,000	445,000	40,740	489,500	-3,760
2010	529,060	474,000	474,000	55,060	521,400	7,660
2015	572,400	NA	503,000	69,400	553,300	19,100
2020	NA	NA	532,000	NA	585,200	NA

The following briefly summarize these issues

FAA Guidance on Forecast Comparisons: The FAA has issued guidance concerning forecast comparisons in only two specific areas. For purpose of environmental analysis, the FAA requires revisions to some environmental analysis if actual or new forecast activity levels are more than a certain percentage different from those relied

upon for the initial analysis. For instance, if an airport's forecast is 10% or more different than the TAF, documentation is required to reconcile the difference or a supplemental analysis is performed.[1/] The previous text documents the FAA's consideration of the 2000 TAF relative to activity evaluated in the FSEIS.

For Part 150 Noise Compatibility Planning purposes, the FAA uses a 15% difference in actual activity relative to modeled conditions to justify the need to perform an updated noise analysis. The FAA has chosen for noise purposes the 15% rule, as this level of activity ensures that any change in noise is less than the 1.5 DNL (Day-Night Average Sound Level) threshold of significance used by the FAA.[2/]

The 2000 TAF operations level is about 11% greater than the Case 1 forecast for 2010 (the level considered in Chapter 5 of the FSEIS) and 14% greater than the 2015 Case 1 extrapolation. The 2000 TAF is less than 4% greater than the condition evaluated in Appendix D (Case 3) for 2015. While the TAF projection is slightly greater than the 10% FAA guide, the FAA has considered the differences, as documented in this re-evaluation. First, the 2000 TAF for operations is 0.2% greater than the 1996 TAF that led to the development of the FSEIS. Second, actual condition in late 2000 and early 2001 are producing lower airport operations than occurred in 2000. As the 2000 TAF was prepared when national economic conditions were better than the current conditions producing less air travel demand, it is likely that the next TAF will reflect lower air travel projections that are more in line with the 1996 TAF and/or FSEIS forecast.[3/] Finally, the FSEIS considered a contingency forecast which is within the 10% FAA guidance range. For these reasons, the FAA believes that the difference between the 2000 TAF and the FSEIS forecasts does not warrant further environmental review.

Capacity of Existing Airfield: In preparing the forecasts for the Final Supplemental EIS, future demand was first identified. To consider the level of activity associated with the Do-Nothing (without the Third Runway), the operating capability of the existing airfield was assessed. The operating capability of the existing airfield was based on the 1992 Flight Plan Study EIS that found that the maximum *theoretical* capacity of the existing airfield is 460,000 operations, assuming that operations are extended into the late evening and early morning and that greater levels of delay would be experienced. Overlaying the delay curve relative to then current delay conditions, the Final Supplemental EIS re-validated the estimate of the existing airfield operating capability at 460,000 annual operations; it also noted that

> "To calculate an extreme capacity of the existing airfield at Sea-Tac, this hourly capacity could be multiplied by the number of hours in a day, and days in the year. Theoretically, 481,800 operations would be accommodated, reflecting that air travel demand is typically concentrated into a 16 hour period (6 am to 9 p.m.) based on today's fleet mix and passenger demand profile." Page II-9

1/ FAA Order 5100.38A Change1 provides guidance for approval of aviation forecasts. Paragraph 428(a) indicates that "FAA should review sponsor forecasts to ensure they are realistic and provide an adequate justification for the airport planning and development. The study should include data supporting the forecasts, including information that can be used as a basis to update the Terminal Area Forecast (TAF). When the forecast is different from the TAF (differences of 10 percent and more, or any difference that affects timing and/or cost of development in the NPIAS/ALP) differences must be resolved with APO-110 and/or the sponsor. If the variance does not result in such change, then the FAA may accept the forecast without further coordination."

2/ A 15% increase in activity relative to a base condition would produce less than 1.0 dBA change in noise. The 15% change is noted in the FAA Part 150 Checklist for Noise Exposure Maps (NEM III.B.). This change in sound is based on the mathematical equation 10*Log (new activity/old activity).

3/ Based on the lower growth rate expected to be included in the 2001 TAF, it is likely that the 2001 TAF for Sea-Tac will be within the 10% difference criteria used by the FAA.

When considering the consequences of not adding a Third Parallel runway, the FAA must consider how the air transportation system at Sea-Tac and in the region would evolve to accommodate the anticipated increases in air travel demand. If the Third Runway were not completed at Sea-Tac, it is reasonable to assume that the FAA would take actions (such as air traffic instrument procedures and possibly actions involving the locations of navigation aids), to enable more landings to occur during poor weather. While 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. For purposes of this evaluation, only those actions that would occur without the Third Runway were considered.

The Third Runway would increase arrival processing capability, which during good weather (VFR1) is 60 arrivals an hour, by 20% during VFR2, 40% during IFR1, and 60% during IFR2/4 (Table I-3 FEIS). It is reasonable to assume that without the Third Runway, actions such as the Localizer Directional Aid (LDA) approach would be instituted. An LDA would improve the ability to land during VFR2 conditions at Sea-Tac but would not affect landings during IFR conditions; the net benefit would be an increase of about 6.5% on an annual basis from an LDA. In addition, other technological improvements may occur toward the forecast horizon of 2010 that would also incrementally increase the number of hourly landings during poor weather. Technologies that may be available in later years, coupled with LDA, could increase the overall operating capability of the existing two runway system at Sea-Tac from the 460,000 predicted in the FEIS/FSEIS to in excess of 500,000 operations. Together these actions would be expected to increase the operating capability of the two runway system. Precisely how much higher than 500,000 would depend on the aircraft fleet mix at the time, technology, and weather conditions in any respective year.[4/]

Activity and Capacity With the Third Runway: Because actual activity levels for 2000 will exceed the Final Supplemental EIS forecast activity levels for 2000, the FAA has considered whether forecast levels for 2010 are also too low. The FAA must determine whether such higher growth rates will continue through 2010 and require an adjustment of the 2010 "With Project" forecast. If so, the difference between the *with* and *without* levels could be larger than forecast in the Final Supplemental EIS with a resulting difference in some categories of environmental impacts.

The Master Plan Update forecast demand to reach 35.8 million annual passengers and 474,000 annual aircraft operations by 2010, the end of the planning horizon. Appendix D's contingency forecasts examined conditions beyond 2010 for three conditions. Case 1 examined a linear interpolation from 2010 conditions to predict

---

4/ In June 2001, the FAA issued "Airport Capacity Benchmark Report 2001" which characterized Sea-Tac's existing delay conditions as "while only about 1% of all flights at Seattle are delayed more than 15 minutes from their estimated flight plan arrival time, the airport operator emphasizes that almost a third of airline flights arrive more than 15 minutes later than scheduled." The reference to 1% of flights delayed more than 15 minutes is reference to the OpsNet data that quantifies the number of flights that are delayed more than 15 minutes during any one of four operating phases. FAA Washington DC has readily noted that the FAA does not maintain delay data in a way that clearly quantifies delay associated with specific conditions. As a result, existing operational capability is often assessed using OpsNet data, as well as the Airline Service Quality Performance (ASQP). ASQP data for Sea-Tac indicates that 33.3% of arrivals arrived more than 15 minutes late. When conducting planning for airport improvements, simulation data, such as that used by the Capacity Enhancement Plan are used. Simulation models enable the quantification of average delay per aircraft operation, and enable the identification of conditions that led to delay.

conditions in 2020. Case 2 and 3 then examined activity levels and environmental conditions, if activity were 10% greater than the Case 1 conditions.

The Final Supplemental EIS recites the difficulty of making long-range airport activity forecasts.[5/] The factors that made precise forecasts for 2010 and 2020 difficult in the Final Supplemental EIS still affect forecasting. After review of the actual activity levels since 1997, the TAFs for the intervening years (including the 2000 TAF), and the factors affecting operations at the Airport, the FAA has concluded that a new forecasting effort would be unlikely to provide a new forecast that would materially change the environmental impact analysis of the Final Supplemental EIS. The environmental consequences of these differences are considered in a following section.

As is shown in **Table 2**, the Case 3 activity levels for 2010 is within 4% of the 2000 TAF (TAF is 529,060 operations versus Case 3 at 521,400). The TAF is 11% greater than the Master Plan forecast of 474,000. While the passenger levels are much more closely related, the annual aircraft operations differs primarily due to assumptions concerning commuter aircraft operations. Based on a review of the two activity projections, and difficulty in predicting how the commuter markets will evolve, the FAA has determined that the differences alone do not warrant conducting additional environmental review.

Support from Area Airports: The Final EIS, which preceded the Final Supplemental EIS and remains the basic environmental document analyzing the impacts of the projects, also recognized that other airports in the region might begin to serve commercial air travel demand. The FEIS states:

> It is recognized that commercial air service at an existing airport in the Region could be initiated at any time. It is likely that such air service would be by a charter or niche carrier (cargo, low-cost, etc.). However such activity would not materially affect the demand at Sea-Tac and the resulting facility needs. Low-cost operators have historically initiated new service at an airport with 30 or less aircraft operations. As such, this would represent less than 3 percent of Sea-Tac's current daily aircraft operations – and would likely amount to less than 1 million enplanements a year (10 percent of Sea-Tac's enplaned passengers). FEIS, Page II-9

The FAA is aware that carriers have from time to time investigated initiating commercial air carrier service from Boeing Field or Paine Field, and is also aware that on occasion certain operations have been relocated to Boeing Field to avoid restrictions at Sea-Tac Airport. It is therefore likely, as the Final EIS recognizes, that if the Third Runway is not built and demand for air travel in the region continues to grow, that not only would air traffic control instrument procedure actions be undertaken to satisfy demand, but some portion of that demand would be served by one or more other airports.

An examination of the Master Plan's for both Boeing Field and Paine Field indicate that both airports anticipate commercial passenger service in the future. The Master Plan underway for Boeing Field includes 9,000 passenger aircraft operations accommodating 77,000 passengers in 2010 and growing to 10,200 operations in 2015 with 89,300 passengers. The Paine Field forecasts examined several scenarios, ranging from 176,000 passengers in 2009 to 1,014,000 passengers. By 2014, Paine Field estimated a range of 192,000 passengers to 1,106,000 passengers. The forecast adopted for use in the Paine Field Master Plan was the low end of the range with

---

5/ See Final Supplemental EIS, p. D-1 – D-3

176,000 annual passengers and 10,100 annual operations in 2009 or 192,000 passengers and 11,000 operations in 2014. Thus, within the planning horizon, it is possible that as many as 19,100 annual passenger aircraft operations could be accommodated at existing airports within the region.

Based on the anticipated strong growth in air travel demand, Sea-Tac's role as the sole commercial passenger service airport, and a probable limitation in the operating capability of Sea-Tac, it is reasonable to assume that the airlines will continue to serve the passenger demand. Such service could realistically include continued evolution of the demand profile at Sea-Tac to accommodate greater levels of passenger and aircraft activity coupled with initiation of limited passenger service at one of the region's existing airports. The Final EIS and Final Supplemental EIS anticipated this probability as noted.

Forecasting Conditions Beyond a 10-year period Remains Uncertain: The Final Supplemental EIS contained a detailed description of the difficulties with preparing forecasts of aviation activity. Since the issuance of the Final Supplemental EIS, the FAA has issued its TAF each of the three years, and in each year the forecasts have been changed to reflect the most recent conditions affecting the aviation industry. Since the issuance of the 2000 TAF, aviation activity across the country increased initially, but began to flatten off as a result of several conditions, including a slowing of the national economy, increased congestion in the aviation system, and increases in fuel cost which caused an increase in the cost of air travel. Because these conditions began in the latter part of the second quarter of 2000, it is uncertain as to their effects on actual activity levels and on future TAFs.

* * *

The FAA has reviewed the new (2000) TAF and the actual activity at the Airport since 1997 to determine whether this new information is sufficient to require a new EIS or another supplemental EIS. The FAA has considered the statement in Order 5050.4A that "a supplement is not required if the only change is the development of additional data, provided such data are not in conflict with the environmental document." Paragraph 104b. A new or supplemental EIS will be required only if "the contents of the original document are no longer applicable, adequate, accurate or valid."

Therefore, the FAA's review focused on two issues: (i) whether the forecasts in the Final Supplemental EIS are still substantially valid, and (ii) whether the data and analyses of environmental impacts are still substantially valid. If the FAA determines that a new set of forecasts either would not produce substantially different numbers for either of the forecast years, or that any differences in forecasts would not substantially affect the analysis of environmental impacts, a new or supplemental EIS is not required.

2. Environmental Consequences

Because activity levels at Sea-Tac have increased faster than was considered in the Final Supplemental EIS, and because of the discussion in the preceding section, the FAA considered the environmental consequence of an additional scenario. In considering these issues, the FAA focused on the difference in activity levels that would be accommodated with the proposed projects versus the activity that would be accommodated without the projects.

As was noted in the preceding section, the only new forecast that has been prepared for Sea-Tac is the FAA's Terminal Area Forecast. Therefore, for purposes of this re-evaluation the 2000 TAF is being used to define the With Project condition.

TABLE 3

COMPARISON OF TAF-BASED DO-NOTHING TO "WITH PROJECT" ACTIVITY LEVELS

	Total Passengers		Total Operations	
Year	Do Nothing	With Project (TAF)	Do-Nothing	With Project (TAF)
2000	27,400,000	27,400,000	420,700	420,700
2005	33,805,000	33,805,000	485,740	485,740
2010	39,746,000	39,746,000	500,000	529,060

Source: FAA, based on issues documented in this re-evaluation
Note: The 2010 Do-Nothing condition assumes that demand is continued to be served in the region, with the significant portion being accommodated at Sea-Tac Airport in accord with the theory articulated by Dr. Richard DeNeufville as documented in the FEIS page II-10.

Comparing the data shown in **Table 3** for the With Project to the Do-Nothing, indicates that Sea-Tac (and possibly an existing airport in the region) would likely continue to accommodate the passenger demand. However, Sea-Tac Airport would likely not be able to accommodate the 2010 air traffic demand (operations). The Final Supplemental EIS noted that in 2010 Sea-Tac could not accommodate about 14,000 annual aircraft operations (474,000 operations with project and 460,000 without project) but could accommodate the entire passenger demand, through spreading the peak and increasing load factors/aircraft sizes.

Using the TAF data and current operating conditions, Sea-Tac would likely continue to not be capable of accommodating about 29,060 annual aircraft operations in 2010. Approximately 19,100 of these operations could occur within the region at airports such as King County International Airport or Snohomish County Airport (Boeing Field and Paine Field respectively), leaving about 9,940 operations not accommodated. Similar to the evaluation performed for the Final Supplemental EIS, it is reasonable to assume that the passenger demand could continue to be accommodated through increased load factors and spreading of the off-hour peaks.

This re-evaluation considered the environmental consequences of the TAF. Three primary environmental factors are affected by the level of activity at Sea-Tac Airport: a) aircraft noise and land use, b) air quality, and c) surface traffic conditions. The following briefly summarize how current activity levels would affect these factors.

a) **Noise and Land Use**

Noise impacts depend to a considerable degree on operations levels. The FAA has considered whether the potential differences in activity levels described above may produce significant difference in noise impacts of the Master Plan Update projects. The FAA has considered both whether the noise analysis in the Final Supplemental

EIS is still substantially valid, and whether the mitigation program required by the Final Supplemental EIS is sufficient to mitigate impacts of the projects even if the potential differences in activity levels occur.

As is noted earlier, the higher activity projections of the TAF are less than the 15% threshold used by FAR Part 150 to develop official noise exposure maps for an airport. Based on FAR Part 150 guidance, no additional noise exposure analysis would be required and the contours prepared for the FSEIS would remain valid. This 15% rule used by the FAA was established because a 15% change in activity would increase aircraft noise exposure by 1.0 DNL, which is less than the 1.5 significance threshold used by the FAA in its NEPA evaluations.

Further, the Final Supplemental EIS contains an analysis of noise impacts for operations levels considerably higher than those in the main text of the Final Supplemental EIS. Appendix D assumed a 10% greater growth rate than the main text, and calculated noise impacts for 521,400 operations in 2010. In 2010, the Final Supplemental EIS shows the following population affected by DNL 65 or greater noise:

2010 Without Project	11,940
2010 With Project	13,220
2010 Case 3 contingency w/ project	15,340 (Appendix D Table D-2)

The difference in impacted population between the two cases (main text and contingency case 3) is 2,120 people.

The Port has recently updated its noise exposure contours through the Part 150 Study process and found that noise has not decreased as rapidly as was anticipated in the FSEIS. The Part 150 Study showed, however, that substantial reductions are still anticipated, as noisier aircraft (MD80 and F-28) are transitioned out of the fleet at Sea-Tac. Therefore, while the exact magnitude of total people affected by aircraft noise today is greater, substantial decreases in the future are still anticipated. More importantly, the comparison of *With Project* to *Without Project* would remain the same and mitigation is required in the FSEIS/ROD.

The population and housing units affected by 521,400 operations are already covered by the Port's noise mitigation commitments to the FAA in the Final Supplemental EIS. The noise mitigation program was designed to cover noise impacts exceeding those projected in the Final Supplemental EIS, should they occur.

> Following commencement of operations on the new runway, but prior to the year 2010, the POS [Port] and the FAA will undertake a further supplemental evaluation of noise and land use impacts anticipated after the year 2010. . . . Following completion of that evaluation, if significant additional adverse environmental impacts are found, the Port of Seattle will be required to adopt further noise and land use mitigation measures designed to minimize any significant adverse affects [sic] found in that evaluation. ROD, 21

The FAA found that such additional mitigation is feasible. The FAA further determined that "even if the maximum additional adverse environmental effects estimated in Appendix D should occur, it would still make the decisions set forth in this ROD and would approve the projects, subject to the special condition with respect to additional mitigation." ROD, 22

The FAA considers the mitigation commitments of the Port sufficient, in light of the ROD, to mitigate all of the impacts of any such higher growth.

It is important to note that in response to the FSEIS and the PSRC Expert Panel review of noise conditions at Sea-Tac, the Port undertook an unprecedented Part 150 Study for the purpose of collecting data to improve the credibility of the noise modeling process. Airport operational data and noise measurements were taken over a 12-month period. Based on this data, improvements in the accuracy of the noise modeling process were identified and incorporated into the Part 150 Noise Study contours. While these changes in the noise exposure contour process change the characterization of noise conditions for each existing and future condition, it would not significantly change the comparison of the With Project and Do-Nothing condition. Based on the Part 150 noise contours, which are larger than the EIS contours, the mitigation would continue to be necessary upon commissioning the runway as was described and depicted in the FSEIS. It is likely that additional homes along the northwest corner of the existing noise remedy program boundary would require sound insulation; these properties are included in the ROD mitigation commitment for insulation.

It is also important to note that had the noise model calibration data been available at the time that the EIS was prepared, that data would have been reflected in the FEIS/FSEIS noise contours. FAA EIS guidance does not require the collection of such data, and at the time of the analysis neither the FAA nor the airport operator expected that actual annual data would differ from the default information imbedded in the noise model. See Attachment A, page A-4 for further discussion of the changes made during the Part 150 to the modeling data. However, in response to public input, the Port conducted the Part 150 (a study which as was expected by the EIS) to address these public concerns. The Port is in the process of updating the noise exposure maps to reflect this new information. The FEIS and FSEIS acknowledged that the Port would undertake an update of its Part 150. In addition, the FSEIS deferred refinement of the approach transition area acquisition to the Part 150 Study. Because of these issues, and the ROD requirement to update the contours upon commissioning the runway and to mitigate any now unforeseen impacts, the FAA believes that the Part 150 Study contours do not make the EIS contours invalid.

As noted earlier, the FAA is requiring the Port to develop a new noise analysis upon commissioning the runway and to identify mitigation based on actual operational characteristics. In light of this commitment, the FAA believes that developing additional noise contours at this time in response to the 2000 TAF is unwarranted and could be misleading, because of the changing conditions that can not be predicted at this time.

b) Air Quality

In preparing this Re-evaluation the FAA must consider whether the finding made under the conformity provision of the Clean Air Act remains substantially valid. The ROD concluded that the projects would not exceed the de-minimis thresholds for general conformity, and would conform to the Washington State Air Quality Implementation Plan. In evaluating emission in the FSEIS, emissions were categorized as operating, which included the operation of airport sources upon completion of projects, and construction, the emissions associated with the construction activity. As that analysis showed, the primary project-related emissions occur during construction. With the project changes discussed above, the project will not exceed de minimis thresholds or cause any significant air impacts that were not fully discussed in the SEIS.

Relative to the operating emissions, one of the primary considerations in evaluating air quality and conformity with the SIP is differences in the level of activity between the With Project and that of the Do-Nothing. In preparing the FSEIS, in 2010 the With Project was found to accommodate 14,000 annual aircraft operations more than the Do-Nothing (with the project 474,000 annual aircraft operations, and 460,000 operation under the Do-Nothing). Because the higher level of activity with project is accommodated in a much more efficient manner, air emissions (particularly for nitrogen oxides) are less with project than without. Therefore, when considering the TAF activity, the differences between the With Project and Do-Nothing from an activity and efficiency perspective must be considered.

For evaluation purposes, the 2000 TAF projections of 529,000 annual operations for 2010 would reflect the With Project, or regional air travel demand. Under this scenario, a Do-Nothing scenario must be postulated. The FAA believes that with a higher demand, several scenarios might exist: 1) all of the demand could be accommodated at Sea-Tac, with an associated extreme delay condition (about 64 minutes of average arrival delay versus 13 minutes with project); or 2) some portion of demand could be accommodated at Sea-Tac, with the remaining accommodated at other airports in the region. While slight differences in air emissions could occur with either scenario, the differences would be minor, approximately equal to that already addressed in the FSEIS. As was noted in an earlier section, while higher levels of activity are predicted by the TAF (in comparison to the FSEIS), it is likely that the region (through Sea-Tac or another airport) would accommodate a growing portion of that demand. For operating emissions, it is believed that emission benefits will continue to be achieved with the implementation of the proposed Master Plan Update projects relative to the Do-Nothing/No Build, as air travel demand will continue to be accommodated within the Puget Sound Region.

As was discussed in Appendix B of the FSEIS (Conformity evaluation), construction emissions represent the potential to exceed the de-minimis threshold. As is noted in the Port's response to comments in the Clean Water Act Section 404 process, the Port has continued to monitor its compliance with its de-minimis commitments in the FSEIS and ROD. The Port has evaluated its annual construction emissions and shown that the de-minimis thresholds will not be exceeded. To further confirm this compliance, the FAA has obtained a written commitment from the Port to prepare annual submittals demonstrating its de-minimis compliance, and thus, has no new information that would indicate that the Port or the proposed projects would not meet the Clean Air Act conformity requirements. The FAA will make this annual submittal a requirement of the Port's grant agreements. Therefore, relative to all direct and indirect emissions, conformity would continue to be met in the 2010 period.

Conformity analysis through 2010 was sufficient for purposes of the SEIS and was accepted by the US Court of Appeals. It remains the appropriate timeframe for this Reevaluation. The conformity requirement is not a general regulatory provision, but is limited to ensuring that federal activities do not interfere with the effectiveness of state implementation plans. The Seattle region currently is in attainment for ozone, and subject to a maintenance plan that regulates air quality through 2010. The regional clean air agency (Puget Sound Clean Air Agency) is currently revising its emissions inventory for the maintenance plan and the Port anticipates that the emissions for Sea-Tac Airport will reflect current regional growth, airport growth and anticipated airport development. The FAA has concluded that the de-minimis threshold would not be exceeded through the foreseeable future and this determination is sufficient to satisfy the requirements of the Clean Air Act.

For the period after 2010, the State of Washington must revise the maintenance plan. The maintenance plan itself provides for revision: "Such a revised SIP will provide for an additional ten years of maintenance." 61 FR 50441. Under this statutory mandate, the federal, state and regional air quality agencies will review current emissions data, which will include emissions estimates based on Airport activity at that future time, and updated forecasts of future Airport activity for the period after 2010. The revised plan will have to include whatever measures are deemed appropriate by the air quality agencies to ensure continued compliance with national air quality standards. Because the Airport, with the Master Plan Update projects, is already included in the Metropolitan Transportation Plan, all of its projected activity in the air and on the ground must be accommodated in the updated plan. USEPA must approve the revised plan. The updated plan will not require reliance on the Port's written commitment to the FAA.

c) Surface Traffic Conditions

In examining the effect of higher levels of airport passengers on surface traffic conditions, a comparison was made against the Master Plan traffic levels for the year 2000 with the levels evaluated for the base condition for 1999/2000 for the ongoing Joint Transportation Study (JTS -- the study funded by the City of SeaTac and Port of Seattle for purposes of examining traffic conditions in the airport vicinity).

A comparison of traffic levels along six roadways was conducted as shown in **Table 4**: International Boulevard (SR 99), North Airport Expressway, Air Cargo Road, South 160th Street, South 170th Street and South 188th Street. The Master Plan Update Final Supplemental EIS found intersections along many of these roadways to be heavily traveled, and in many circumstances with poor levels of service (LOS D or worse).

A comparison of the more recent JTS data shows that the Master Plan Update Final EIS and Final Supplemental EIS used very conservative (high traffic levels) when assessing surface traffic conditions in comparison to what has actually occurred on these roadways.

Actual traffic levels were less on all roadway segments, with the exception of four segments: a) North Airport Expressway from SR 518 to the terminal; b) Air Cargo Road from S. 160th to Airport Expressway; c) Air Cargo Road from North Expressway to S. 170th, and d) South 170th Street from Air Cargo Road to North Expressway. All of these segments are in the same general vicinity, and appear to reflect the greater number of passengers using the on-airport roadway system. Further, while slightly greater actual traffic has occurred on these roads, the FEIS and FSEIS noted that traffic conditions were and would continue to be relatively good, except at Air Cargo Road and S. 170th. At Air Cargo Road/S. 170th, the Port and City of SeaTac have proposed a signalized intersection (as was noted in the FSEIS), independent of the Master Plan to resolve low levels of service. Therefore the carrying capacity of these roads is capable of accommodating the slightly higher traffic levels. It is important to note that surface traffic on off-airport roadways is consistently less than was predicted.

Therefore, despite the higher levels of actual airport activity, surface traffic conditions on area roadways have not worsened in proportion to the increase. Rather, the increases in airport activity have not produced commensurate increases in surface traffic levels. Because the existing conditions for most roadways were over

predicted in the FSEIS, it is reasonable to assume that conditions that might be associated with a TAF level of future activity have already been accounted for in the evaluation prepared for the FSEIS. For the few roadways/intersections where actual traffic is greater than evaluated in the FSEIS, the slight differences would not have a material effect on traffic flow given the carrying capacity of the existing roads. Thus, it is reasonable to assume that the traffic conditions evaluated in the Final Supplemental EIS, by virtue of being conservative/over-predictive, have identified adequately actual traffic conditions and conditions associated with the 2000 TAF. Based on the surface traffic conditions, no further analysis would be warranted, as the traffic analysis in the FSEIS is substantially valid.

Table 4

Comparison of Actual to Projected Surface Traffic
(Average Daily Traffic Levels)

Roadway From/To	**Actual 1999/2000 JTS**	**FSEIS 2000 W/o project**	**FSEIS 2000 W/ Project**
International Boulevard/SR 99			
State Route 518 to S. 160th Street	33,000	43,600	42,900
S 160th Street to S 170th Street	27,500	36,600	35,500
S. 170th Street to S 176th Street	35,000	39,800	38,300
S 176th Street to S 180th Street	32,500	47,700	45,800
S 180th Street to S 188th Street	39,500	62,100	59,900
S 188th Street to S 192nd Street	37,000	53,600	51,500
Northern Airport Expressway			
State Route 518 to Terminal	58,100	56,100	55,400
Air Cargo Road			
S 154th Street to S 160th Street	9,700	12,100	12,400
S 160th Street to North Airport Expy	12,400	9,600	9,600
North Airport Expy to S 170th Street	13,500	12,500	12,400
South 160th Street			
Air Cargo Road to International Blvd	8,300	10,900	10,700
South 170th Street			
Air Cargo Road to North Airport Expy	12,500	12,600	12,300
North Airport Expy to International Bl	14,400	16,100	15,800
South 188th Street			
28th Ave S to International Blvd	24,500	28,700	27,200
International Blvd to Military Road	31,700	36,900	34,500

Source: Port of Seattle

B. Modifications to the Master Plan Update Project

As with any airport development project, refinements are made in the plan as projects move from planning documents to design and construction. In the case of the long-range Master Plan Update improvements, a number of refinements were identified subsequent to the preparation of the Final Supplemental EIS. These include:

- Revisions to the Concourse A expansion to enable an additional gate and to provide a six story office complex – this project also was modified such that the existing Delta Hangar was demolished, with a new hangar to accommodate Northwest Airlines.
- Implementation of a Hydrant Fueling System for the existing terminal and future terminals
- The Construction Only Temporary Interchange from SR 509, Modifications to the Third Runway Embankment and Retaining Wall, and Other Matters
- Expansion and improvements to the Industrial Waste System (IWS)
- Expansion of the South Electrical Substation;
- Expansion of the Main Terminal (North Esplanade) and Satellite Transit System (STS)
- Development of an Air Cargo Plan, which reinforced the Master Plan recommendations and recommended the development of a secure bridge from the existing north cargo area to the warehouse area north of SR 518 (warehousing recommended by the Master Plan);
- Refinements to the Auburn Wetland Mitigation Program;
- Temporary aircraft overnight parking on taxiways recommended by the Master Plan;
- Development of landscaping design standards

All of these projects were processed under the Washington State Environmental Policy Act (SEPA) as either Determinations of Non-Significance, Mitigated Determinations of Non-Significance or addendums to the Master Plan Update EIS. As a result, their impacts are either minor or have been mitigated. The FAA has reviewed these project SEPA documents, as noted in Attachment A to this re-evaluation, and determined that these projects are either a) design changes that are not significant or do not produce significant new information or environmental consequences, b) categorically excluded under the National Environmental Policy Act (per FAA Order 5050.4A, paragraph 23), or c) were adequately addressed in the Final EIS/Final Supplemental EIS. The cumulative effect of these projects, in combination with the Master Plan Update projects, are discussed in the following section.

C. Cumulative Impacts of Project Modifications and Changes in the Surrounding Environs

As would be expected, since publication of the Final EIS and SEIS, more detailed information has become available on other projects in the vicinity of the Airport. In response to comments concerning cumulative impacts, the Port has prepared a detailed review of cumulative impacts as documented in their response to public comments on the Clean Water Act Section 404 permit (See General Response GLR19). The FAA has reviewed that response and much of the underlying non-airport documentation and generally concurs with the Port's review. That

response is included by reference and shows that while a clearer definition of the non-airport projects have been prepared, no significant cumulative impacts are expected to occur.

III. CONCLUSION

Consistent with the requirements of 40 CFR 1508.7 and 40 CFR 1502.9, the FAA has taken a systematic "hard look" at the new environmental information and planned changes in elements of the Master Plan Update. FAA Order 5050.4A, Paragraphs 102b and 103 were considered. Relative to Paragraph 102b, the FAA has reviewed the status of the project. As is shown in this re-evaluation, the project is substantially underway. Relative to paragraph 103, three considerations were made: a) proposed action conforms to the plans for project upon which the FEIS/FSEIS was prepared, b) the data and analysis in the FEIS/FSEIS remain substantially valid, and c) all pertinent conditions and requirements of the prior approval have been or will be met.

As is shown in this re-evaluation, the project changes conform to the project upon which the FEIS/FSEIS is based. Further the re-evaluation shows that the data and analysis in the FEIS/FSEIS is substantially valid. Finally, the FAA has reviewed the Port's actions since issuance of the ROD. The Port has either implemented or has plans to implement all of the conditions and requirements of the ROD (such as Best Management Practices, air emissions evaluations, conduct of the Part 150, continued sound insulation, and implementation of acquisition and relocation processes). The FAA has considered the significance of the new information that has been developed for these projects and evaluated the information for potential cumulative impacts with those impacts identified in the Port's Master Plan Update Final EIS, Final Supplemental EIS and supporting environmental documentation. In each case, and collectively, the new information and the effects of the projects are either not significant or are not substantially greater than what had been reported previously.

The FAA has concluded that major steps toward implementation of the Project have occurred. A second supplemental EIS would not show significantly different impacts of the Project.

David Field
Manager, Planning, Programming and Capacity Branch
Responsible Official for the Seattle-Tacoma International
Airport Master Plan Re-Evaluation

ATTACHMENT A

NEPA CONSIDERATION OF OTHER PORT PROJECTS

Since publication of the FEIS and SEIS, the Port has conducted refinements to elements of the Master Plan Update and identified additional projects that are necessary. This appendix presents the FAA's examination of the impact of these projects relative to the National Environmental Policy Act. In all cases, except where noted, the Port has completed an environmental review of the project per the requirements of the Washington State Environmental Policy Act (SEPA). As this appendix shows, none of these projects are expected to cause significant adverse impacts individually or in combination with the Master Plan Update projects.

1. South SeaTac Electrical Substation Upgrade

This project will expand the capacity of the existing South SeaTac Substation by constructing a new substation next to the existing one and installing approximately 1.2 miles of 115kV high transmission lines on segments of South 188th Street and 28th Avenue South. The Port completed a SEPA checklist and made a Determination of Non-Significance (DNS) for this project.

The proposed substation project will not affect airport activity (either aircraft or surface transportation) upon completion of the project. As a result operation of the project will have no impact on noise, land use compatibility, social impacts, induced socio-economic impact, air quality, DOT 4(f) lands, historic/architectural/archaeological and cultural resources, endangered species of flora and fauna, floodplains, coastal zone management and/or coastal barriers, wild and scenic rivers, farmland, light emissions, and solid waste.

The project will have a slight effect on water quality, biotic communities (plants and animals), wetlands, and energy supply and natural resources, and will generate short-term construction impacts. However, these impacts are not expected to be significant and are expected to be concentrated on airport lands. As is described in the Port's SEPA checklist supporting its determination of non-significance, two shrub and forested wetlands are located 50 feet south and 50 feet east of the proposed substation site. The wetlands south of the site contain both forested and emergent wetland habitats. Groundwater seepage into the wetlands during the wet season maintains the area as a wetland. The wetlands lack any distinct surface water inlet or outlet features. The wetlands are small in size, have been subjected to recent disturbance, and have limited biological diversity. No structures will be constructed within 65 feet of the wetlands, and measures to minimize erosion, and off-site sediment transport will be implemented. The project will have a benefit to the electrical capability of the airport, by providing redundancy, but will not generate measurable additional electrical consumption.

2. South Terminal Expansion (Concourse A and related projects)

Much of this project was analyzed under the Master Plan Update FEIS and FSEIS, as Table 2-7 of the FSEIS notes "Expansion of Concourse A including expansion of Main Terminal at A". Changes to the terminal expansion proposal were discussed in the Port of Seattle's July 19, 1999 *South Terminal Expansion SEPA Checklist*, and considered in a Mitigated DNS dated July 19, 1999. The project will be constructed on a previously developed portion of airport property and is expected to include the following elements: Concourse A Extension, Office Tower Building, tenant supporting space, South Ground Transportation Lot, Remain Overnight Aircraft Parking, apron paving, demolition of existing Delta Airlines hanger and construction of a new Northwest Airlines hanger on the site, Northwest

Airlines flight kitchen, aircraft lavatory dump station replacement, and construction staging area. The project changes do not substantially alter the Master Plan EIS analysis of potential environmental impacts.

3. Expansion of the Main Terminal (North Esplanade) and Satellite Transit System (STS)

This proposal was analyzed in the May 13, 1997 Master Plan Final Supplemental EIS, as is noted in Table 2-7 as "Overhaul and/or replacement of the STS". The upgrade entails relocation of the existing north security checkpoint, construction of a new vertical circulation core, improvements to the satellite transit system, interior remodeling, and extension of the north end of the main terminal by approximately 75 feet. Project modifications are discussed in the August 23, 1999 SEPA Addendum. The modifications do not substantially alter the analysis of significant impacts described in the Master Plan FSEIS.

4. Upgrade and Expansion of Industrial Wastewater System (IWS) Lagoon #3

This proposal is to clean, line, expand and upgrade an existing wastewater system lagoon. The expanded lagoon will provide greater industrial wastewater storage capacity prior to treatment in the Port's Industrial Wastewater System Treatment Plant and allow for controlled discharge to the King County Metro Sewer line. The proposal received a SEPA Determination of Non-Significance on December 22, 1999. The Final EIS noted that the Port was preparing a Stormwater Management Plan for the airport, for which this was a recommendation of that study.

This project will occur adjacent to (but not in) the northern arms of Wetland 28 (the Northwest Ponds) and wetland IWSA/IWSB (north of the pond). Buffer impacts resulting from the project would be reviewed by the appropriate regulatory agencies and may require mitigation such as buffer averaging or replacement. Other than these impacts, the project would provide water quality benefits and, other than short-term construction impacts, would have no adverse impacts.

5. Aircraft Hydrant Fueling System (AHFS)

The AHFS proposal is to install a Jet A underground fuel line concurrent with the planned improvements to Concourse A. The AHFS would provide single source fuel delivery of Jet A fuel at the airport and a common infrastructure that would be used by all airlines. The AHFS would replace the current fueling operations (primarily truck deliveries) for most commercial passenger aircraft at the Airport. The Port issued a SEPA DNS for the project on October 6, 2000.

The Master Plan Update and FEIS/FSEIS noted that the Port was considering addressing the existing hydrant fueling system, but that no decision had been reached concerning that project. However, it noted that as new terminal facilities are built, such as Concourse A and the North Terminal, they would have hydrant fueling.

6. North Electrical Substation

The North Electrical Substation received a SEPA Determination of Non-Significance on June 2, 2000. This DNS was amended on March 6, 2001 to reflect minor project changes. As currently envisioned, the project involves upgrading and expanding the existing Bow Lake Substation, replacing the North SeaTac Substation with a smaller facility (the North Main Service Point) and installing an 1,800-foot, 12.5 kV underground cable system between the Bow Lake Substation and the new North Main Service Point.

The Bow Lake Substation will be rebuilt on property owned by Puget Sound Energy ("PSE"). The North Main Service Point will consist of switch-gear enclosed in a 25-foot by 60-foot building that is 15 feet tall. The building will be enclosed by a 50-foot by 100-foot fence. The North Main Service Point will be located just east of the south entrance to the Airport parking garage between the entrance booth and the northbound Airport circulation road. The proposed 12.5 kV cable system will extend along the north side of South 176th St., across International Boulevard and onto Airport property.

No wetlands or water bodies are impacted in the construction of this facility. Stormwater collected at the North Main Service Point will flow either into the Port's stormwater collection system or industrial waste system. Catch basins for both systems are located in the area.

7. Temporary Aircraft Parking-Taxiway Stubs

On October 25, 2000 the Port issued a SEPA Determination of Non-Significance to allow use of some existing Taxiways for aircraft parking until the taxiways are needed for the Third Runway. No maintenance or de-icing activities will occur to aircraft parked on the taxiways, and no impacts to aquatic resources are expected to occur from this activity. The development of the pavement to support the aircraft parking was considered in the Final EIS and FSEIS.

8. The Construction Only Temporary Interchange from SR 509, Modifications to the Third Runway Embankment and Retaining Wall, and Other Matters

In January 2000, the Port issued "*Addendum To Final Environmental Impact Statement and Final Supplemental Environmental Impact Statement For Proposed Master Plan Update Development Actions at Seattle-Tacoma International Airport*" under SEPA. This Addendum addressed new information relating to: (a) wetlands and other aquatic resources that would be affected by the planned new runway and other improvements at Seattle-Tacoma International Airport; and (b) potential impacts of temporary construction-related interchanges on SR 518 and SR 509 to be used by trucks delivering fill material to the planned new runway site. This Addendum was prepared by the Port to report the Port's assessment of the new information and its determination that the existing environmental analyses under the Washington State Environmental Policy Act (SEPA) and the National Environmental Policy Act (NEPA) remain adequate. This conclusion was based on the Port's findings that the newly discovered areas of adverse impacts to wetlands and other aquatic resources, and the potential impacts of the temporary construction interchanges, either were not environmentally significant, in light of project changes and mitigation measures, or were adequately covered by the analyses of wetland impacts in the 1996 FEIS and 1997 FSEIS.

This Re-evaluation discusses the consequences of the project relative to wetland impacts and shows that based on the FEIS/FSEIS the FAA believes that there is not the need to supplement the FSEIS. As the temporary construction interchanges were addressed in the FSEIS, and slight changes occurred in the design of the project element that do not create adverse effects, the FAA finds that there is no need to supplement the EIS based on that project.

9. Refinements to the Auburn Mitigation Program

On May 5, 2000, the Port of Seattle issued a SEPA addendum to the FEIS/FSEIS and to the August 1998 SEPA checklist for the Auburn Wetland Mitigation Project. The purpose of the addendum was to analyze the consequences to the mitigation of wetlands for the Master Plan Update projects. The addendum accounted for an increase in the wetland mitigation size and advanced the design of the mitigation site from a conceptual plan to a 60% design. As noted in the Addendum, the project design and increase in mitigation size did not "substantially change the analysis of significant impacts

described in" the FEIS/FSEIS. Based on the FAA's review of the Addendum relative to NEPA, the analysis of the Auburn Mitigation site in the FEIS/FSEIS remains valid.

10. Part 150 Noise Compatibility Plan

In late 2000, the Port of Seattle completed its commitment to update its Part 150 Noise Compatibility Plan as noted in the Final Supplemental EIS and ROD, and formally submitted the Plan to the FAA in mid 2001. The scope of this study was undertaken to respond to comments raised during the Puget Sound Regional Council (PSRC) Expert Panel on Noise as well as comments received during preparation of the FEIS/FSEIS concerning the use of computer driven noise exposure contours. As a result, the Port commissioned the Part 150 Study to collect 12 months of airport operational and associated noise measurements for use in improving the accuracy of the FAA's Integrated Noise Model at Sea-Tac Airport.

The Part 150 study resulted in the preparation of two primary products:

- **Noise Exposure Maps**: The Port updated its existing (2000), 2005 and 2010 noise exposure maps for Sea-Tac after completing an extensive measurement program to validate the model's accuracy. **Table 5** shows that the contours prepared for the Part 150 Study are larger than those prepared for the EIS. This difference is attributed to:

  - A full year of aircraft noise and aircraft operational performance data was collected and used to calibrate the noise model specific to Sea-Tac Airport. A comparison was made between the departure climb profiles actually used at Sea-Tac with that provided in INM Version 5.2. The comparison showed that Stage 3 narrow body aircraft (for their representative stage length) actually climb slower than the INM was predicting. To more accurately represent the departure climb performance, the Part 150 contours used profiles associated with heavier aircraft (aircraft operating to a longer stage length). The departure climb stage length adjustment is the primary reason that the noise exposure contours are larger than was predicted in the FSEIS;
  - A new version of the Integrated Noise Model (the computer model used to evaluate aircraft noise – Version 5.2a was used in the Part 150 Study, while Version 4.11 was used in the EIS) became available after the FAA issued the ROD; and
  - The EIS fleet mix assumed a different fleet mix (aircraft types) versus what is actually occurring, such as Alaska Airlines' planned discontinued use of F-28's.

- **Noise Compatibility Plan**: The Port has submitted to the FAA's its recommended Plan that expands upon the operational and land use recommendations reflected in the Final Supplemental EIS.

The Noise Compatibility Plan continues to reflect the Port's commitment to mitigate noise impacts within the designated noise contours, which is consistent with its commitment in the Final EIS.

Because the conduct of the study was recognized and directed, to some degree, by the FSEIS, the FAA believes that the conclusions do not warrant the preparation of an additional supplemental EIS. The ROD commitment to develop new noise exposure contours once the runway has been commissioned provides the maximum assurance that any project-related impacts will have been mitigated by 2010.

The Port issued a SEPA Determination of Non-Significance for the Part 150 Noise Compatibility Plan on October 20, 2000. The Plan is part of the Port's Noise Remedy program, the goal of which is

to reduce aircraft and ground noise at the Airport, reduce noise impacts on the greater Seattle area, and encourage land uses that are compatible with anticipated aircraft noise exposure. The Plan recommends conducting additional studies including a siting study for the Ground Run-up Enclosure, a siting study for noise walls, recommended changes to runway use and flight tracks, acquisition of mobile home parks, sound insulation of schools, and compatible land use planning by local communities.

Table 5
Comparison of Noise Impacts
Final Supplemental EIS versus the Part 150 (population)

	65-70 DNL	70-75 DNL	75+ DNL	65+ DNL
Final Supplemental EIS				
Existing (1996)	26,230	5,570	0	31,800
2000	10,330	950	30	11,310
2005	9,640	700	100	10,440
2010	11,960	1,070	190	13,220
2000 Part 150				
Existing (1998)	30,600	7,100	0	37,700
2005	10,140	2,560	0	11,700
2010	14,960	360	0	15,320

11. Development of Landscaping Standards

Section IV.24 "Aesthetics and Urban Design" of the FEIS contains a discussion of the conceptual landscaping envisioned in the Master Plan Update for the airport. Subsequent to the Master Plan Update, the Port prepared landscape design standards that represent minimum requirements and provide a clear and concise set of regulations to be use for all exterior development at Sea-Tac. These standards are consistent with the Master Plan and will improve the aesthetic quality of future airport facilities. Based on a SEPA checklist, the Port rendered a DNS for the standards in August 1999. Based on the FAA's consideration of the SEPA checklist, the landscaping standards do not create any significant adverse environmental consequence and the analysis in the FEIS/FSEIS remains valid.

12. Air Cargo Development Plan (ACDP)

In 1999, the Port of Seattle completed an air cargo development plan that refined elements of the Master Plan Update relative to the north cargo area. To comply with SEPA, the Port prepared a programmatic evaluation of the project, but at this time does not have any specific construction plans. The ACDP is a 10-year development plan for facilities and actions recommended to meet the needs of existing air cargo customers at Sea-Tac Airport. Master Plan Update elements included in the ACDP are: purchasing of airport leases to allow redevelopment in the north cargo area, constructing four aircraft hardstands in the north cargo area, constructing freight warehousing in the north cargo area, preparing a site development plan for property north of SR 518 (the "L-shaped parcel"), and redeveloping Port building 313 for air cargo, constructing mail processing and transfer facilities. Items not included in the Master Plan Update include: constructing a non-public bridge across SR 518 (adjacent to the existing 24th Ave. S. bridge), and constructing a ground support equipment storage area. Development of the L-shaped parcel north of SR518 could increase impervious surface because the parcel is currently undeveloped. In addition, preliminary information indicates the presence of wetlands on the site. At the time that the Port pursues development of these non-Master Plan Update projects, the FAA will consider what, if any, additional NEPA evaluations are required.

13. North End Development Project

The North End Development Project (NEDP) is in the initial planning stages by the Port and would cover primarily the area north of the existing main terminal. It is the FAA's understanding from Port briefings, that the project builds on and includes the Master Plan Update improvements to construct a North Unit Terminal (which is currently being called the North End Terminal). The Port continues to define the elements of this project, and as a result, the FAA has not been presented with a plan for review and/or approval. Thus, consideration by the FAA of the NEDP relative to NEPA is not ripe. When the FAA has been presented with a plan for review and approval, the FAA will conduct the appropriate NEPA evaluation.

14. Water System Improvements

The Port proposes to construct water system improvements, including a two-million gallon reservoir, expansion of an existing booster pump station, and other improvements to the fire and domestic water distribution systems at Airport. The reservoir will be constructed on Port-owned land on Host Road, west of the Washington Memorial Cemetery on the east side of the Airport. This location is about 350 feet south of the existing water tower. Construction of the reservoir will involve relocating utilities and the east west portion of Host Road to a point approximately 100 feet north of the new reservoir.

15. Miscellaneous Airport Projects

The following projects are at various stages of the design and planning process. At this time, it is not possible to identify the impacts of the project or to determine, for those projects that were included in the Master Plan Update, how their final design/plan would alter conditions identified in the EIS. These projects include:

- **SASA (South Aviation Support Area):** A final design for the facility has not been completed and the Port is continuing to work on the amount of each proposed use. There are no new environmental documents for SASA. Final evaluations of the SASA facility will take into account the SR509/South Access project and the buffering of Des Moines Creek.
- **TRACON (Terminal Approach Control):** The Master Plan Update FEIS and FSEIS evaluated this project as being located at the base of the new air traffic control tower that is under construction. Since the completion of that study, the FAA has determined that a site on-airport is not necessary and is conducting a siting evaluation, which is investigating a 19-acre potential site at 8th Ave. and 160th Street. The FAA will prepare all requisite environmental analysis for the final site.
- **ASDE (Airport Surface Detection Equipment):** The Master Plan Update EIS evaluated placing the ASDE on top of the air traffic control tower. Since that time, the FAA has learned that there are performance issues associated with locating this type of radar close to buildings. The FAA is currently conducting a siting study for this facility, which to date has determined that the location on top of the new tower could pose visibility issues. Upon selection of a final site, it is expected that the Port will conduct an additional SEPA review, and the FAA will complete any requisite NEPA documentation.
- **Airport Surveillance Radar (ASR-9):** To complete the Third Runway requires the relocation of the existing ASR-9, which is presently located west of the existing runway system. Relocation of the ASR-9 was considered in the FEIS/FSEIS through the review of nine possible sites. The FAA has selected Site 3, at Eighth Place (170th Avenue) and Eighth Avenue South. The radar antenna will be elevated at the site by 160 feet. This will be

accomplished with a 160-ft non-standard tower, or by a standard 45-ft tower placed on fill. The site consists of about 1.1 acres and would have two access points, with the main access being from Eighth Place. On March 15, 2001, the FAA (Seattle NAS Implementation Center) issued a re-evaluation of this project per the FEIS/FSEIS. This project was included in the Biological Assessment (BA) prepared for the Services, and upon which the Services rendered an opinion/concurrence as documented. No wetland impacts would occur. Based on the evaluation of Site 3, the FAA determined in its re-evaluation titled "Re-Evaluation Seattle-Tacoma International Airport Master Plan Update Environmental Impact Statement, Relocation of Airport Surveillance Radar-9" that the project consequences noted in the FEIS/FSEIS remain valid.

- **Approach Lighting with Sequential Flashers (ALSF) for 16L:** Installation of the ALSF-2 on Runway 16L was included in the Master Plan Update FEIS/FSEIS. The Port of Seattle (POS) conducted field investigations for wetlands in the area between March 1998 and October 2000 as access to individual parcels was obtained during the POS property acquisition phase. This field investigation determined that approximately 10 acres of wetland in three distinct locations were present north of Runway 16L.

  The typical ALSF-2 structures consist of lights mounted upon individual towers set into the ground and secured with stabilizing cable guy lines. Because the location of the ASLF-2 is fixed in relation to the landing threshold of the runway, the standard design would have required placement of several tower foundations and stabilizing guy line anchors within the wetlands. To avoid disturbance to the wetlands a span-arch frame was designed to provide a mounting platform for the ALSF-2 lights in their proper location while avoiding the installation of tower foundations or guy line anchors in the wetland areas. The foundations for the span-arch will be located outside the wetlands on their north and south borders. The span-arch will be fabricated off-site, assembled on-site and set into place in a single piece spanning the wetland areas. The remainder of the ALSF-2 lights required in locations outside the wetlands will be installed upon individual towers.

APPENDIX B

RE-EVALUATION OF IMPACTS TO BIOLOGICAL CONDITIONS FROM THE MASTER PLAN UPDATE IMPROVEMENTS AT SEATTLE-TACOMA INTERNATIONAL AIRPORT

JULY 20, 2001

RE-EVALUATION OF IMPACTS TO BIOLOGICAL CONDITIONS

FROM THE MASTER PLAN UPDATE IMPROVEMENTS

AT SEATTLE-TACOMA INTERNATIONAL AIRPORT

TABLE OF CONTENTS

I. INTRODUCTION AND SUMMARY 1

II. EXISTING NEPA DOCUMENTS 4
A. 1996 Final Environmental Impact Statement (FEIS) 5
(1) Endangered Species of Flora and Fauna 5
(2) Biotic Communities 5
B. Final Supplemental Environmental Impact Statement (FSEIS) 8

III. NEW BIOLOGICAL INFORMATION THAT HAS ARISEN SINCE ISSUANACE OF THE FSEIS AND RECORD OF DECISION 10

A. Wetlands 10
B. Endangered Species of Flora and Fauna 11
C. Candidate Species 16
D. Commercially Managed Species 19
E. Migratory Bird Treaty Act 23

ATTACHMENTS
1 – Biological opinion/concurrence of the Services A-1

Table 1
Comparison of Wetlands in Study Area (acres) 27
Table 2
Bird Species Reported near Sea-Tac Airport, wildlife surveys at Dumas Bay, and In the Kent Christmas Bird Count Area 31

RE-EVALUATION OF IMPACTS TO ENDANGERED SPECIES OF FLORA AND FAUNA FROM THE MASTER PLAN UPDATE IMPROVEMENTS AT SEATTLE-TACOMA INTERNATIONAL AIRPORT

I. INTRODUCTION AND SUMMARY

Since the publication of the Final Supplemental EIS (FSEIS) in May of 1997, and the issuance of the Record of Decision on July 3, 1997, the National Marine Fisheries Service (NMFS) and United States Fish and Wildlife Service (FWS) have listed as threatened or endangered, two species of fish that are known to exist in streams and other waters in the Puget Sound that have the potential to be affected by actions at Seattle-Tacoma International Airport. The purpose of this Re-evaluation is to document the FAA's consideration of the new information concerning biological conditions in the area of Seattle-Tacoma International Airport (Sea-Tac Airport) relative to the FAA's duties under the National Environmental Policy Act (NEPA). In addition, this document identifies additional new wetlands affected by the project, as well as Migratory Bird Treaty Act issues.

The Fish and Wildlife Service (FWS), a division of the Department of Interior, and the National Marine Fisheries Service (NMFS) in the Department of Commerce, share responsibility for administration of the Endangered Species Act (ESA). Generally, NMFS possesses ESA jurisdiction over species that spend a majority of their lives in marine environments (e.g., anadromous salmonids), while FWS is responsible for terrestrial and freshwater species and migratory birds. NMFS also administers interpretation of the Magnuson-Stevens Fishery Conservation and Management Act, including Amendment 14 provisions for Essential Fish Habitat.

A species may be classified for protection as "endangered" when it is in danger of extinction within the foreseeable future throughout all or a significant portion of its range. A "threatened" classification is provided to those animals and plants likely to become endangered within the foreseeable future throughout all or a signification portion of their ranges. A "species" includes:

- any species or subspecies of fish, wildlife, or plant
- any variety of plant; and
- any distinct population segment of any vertebrate species that interbreeds when mature.

Excluded is any species of the Class Insecta determined by the Secretary to constitute a pest whose protection under the provisions of the ESA would present an overwhelming and overriding risk to humans. In applying the definition of "species" to anadromous salmonids, NMFS considers a group of salmonid populations to constitute a species for purposes of listing if such populations are (a) reproductively isolated from other conspecific populations; and (b) if such populations represent an important component of the evolutionary legacy of the biological species. NMFS defines its listing unit as an "evolutionarily significant unit" or "ESU."

Once a species or critical habitat has been proposed for inclusion on a list of endangered or threatened species, a notice is published in the Federal Register. The public is offered an opportunity to comment, and the rule is finalized or withdrawn. Species and critical habitat are listed as threatened or endangered on the basis of the "best scientific and commercial data available" considering biological status, threats to existence, and probable recovery. FWS and NMFS (the Services) maintain a list of "candidate" species that are under review for potential listing.

Since issuance of the FSEIS and Record of Decision, additional wetlands were found on the property acquired for the third runway embankment. Two Puget Sound fish species and critical habitat were listed as threatened and essential fish habitat was designated. Chapter 2 of this report summarizes the contents of the FSEIS on these issues, as well as identifies new information that has arisen.

The FSEIS and Record of Decision identified that the Master Plan Update projects would require the fill of 12.23 acres of wetland. The evaluation of wetlands conducted for the FSEIS was based on restricted access to the properties that were to be acquired. The FAA's EIS contractor had requested access to these properties in order to delineate the wetlands, but was not granted access until acquisition was initiated and in some cases complete. Upon access to the properties, additional wetland acreage was identified, such that the project would require the filling of 18.37 acres. While the quantity of wetlands increased, the nature of the impacts is the same and no new environmental consequences were identified.

The Final EIS and FSEIS considered the effect of the Master Plan Update projects at Sea-Tac on the marbled murrelet (*Brachyamphus marmoratus*), which were not found present in the action area. In 1995, a Biological Assessment was prepared for bald eagle and peregrine falcon that determined that the Master Plan Update projects may affect, but were not likely to adversely affect these species. Consultation was initiated in 1995 with FWS who concurred with the determination on December 6, 1995. FWS and NMFS have listed several new species that may occur in the vicinity of Sea-Tac Airport, including the threatened Coastal/Puget Sound bull trout (*Salvelinus confluentus*), and threatened Puget Sound chinook salmon (*Oncorhynchus tshawytscha*). Section 7 of the ESA requires federal agencies to ensure that their actions do not jeopardize the continued existence of endangered or threatened species, or adversely modify their critical habitat.

In April 2000, the FAA re-initiated consultation with the FWS and initiated consultation with NMFS concerning the impacts of Master Plan Update projects over which FAA possesses discretionary involvement or control. In accordance with section 7, the FAA, on behalf of itself and the U.S. Army Corps of Engineers (USACE) prepared a Biological Assessment (BA) for the proposed Master Plan Update action.[1/] The BA for the Master Plan Update projects determined that the Master Plan Update actions over which the action agencies possess discretionary involvement or control may affect, but are not likely to adversely affect bald eagles, bull trout and chinook salmon. The BA further determined that under the range of anticipated conditions,

---

1/ In accordance with applicable regulations, the FAA assumed the role of lead federal agency for purposes of conducting ESA and Magnuson-Stevens Act consultation and designated the Port of Seattle as its non-federal representative for purposes of conducting these consultations. See 50 C.F.R. §§ 402.07-08 and 600.920(b)-(c).

the proposed action would have no effect on marbled murrelets; however, under unlikely circumstance, the proposed action may affect, but would not likely adversely affect this species. In accordance with section 7, the BA was submitted to the Services in June 2000. Supplements to the BA were submitted in November and December 2000 respectively to update the BA with further stormwater analysis information. On May 24, 2001, FWS issued a biological opinion finding in support of the conclusions of the BO. In its conclusions, FWS states:

"After reviewing the current status of the bull trout, bald eagle, and marbled murrelet, the environmental baseline for the action area, the effects of the proposed MPUI, and the cumulative effects, **it is the FWS's biological opinion** that the MPUI, as proposed, **is not likely to jeopardize the continued existence of the bull trout, bald eagle or marbled murrelet.** We reached this conclusion on the basis that the proposed action is not likely to adversely affect these species, as discussed in the Effects section of this opinion.

No critical habitat has been designated for the bull trout or bald eagle. Therefore, none will be affected for these species. Critical habitat has been designated for the marbled murrelet. However, the project does not occur within designated critical habitat, therefore none will be affected for this species."

On May 31, 2001, NMFS concurred with the BA's conclusions that the proposed action was not likely to adversely affect chinook salmon or its critical habitat. In its concurrence letter, NMFS states:

"Effects of STIA projects were evaluated in terms of water quality, hydrology and habitat alterations for various locations within the action area. At several of these locations, chinook salmon do not occur. At other locations chinook occur seasonally or rarely. Consequently, the effects determinations are generally insignificant or discountable (Table 2).

TABLE 2. Summary of STIA Project Effects to Puget Sound Chinook Salmon

LOCATION	Fish Present	Water Quality	Hydrology	Habitat Alterations
Miller Creek	NO	Insignificant	Insignificant	Insignificant
Walker Creek	NO	Insignificant	Insignificant	Insignificant
Des Moines Creek	NO	Insignificant	Insignificant	Insignificant
Gilliam Creek	Rarely	Discountable	Discountable	Discountable
Green River (Mitigation site)	YES	Discountable	Discountable	Beneficial
Miller Creek Estuary	Seasonally	Insignificant	Insignificant	Insignificant
Des Moines Creek Estuary	Seasonally	Insignificant	Insignificant	Insignificant
Midway Sewer Outfall	Adults	Insignificant	Discountable	Discountable

After reviewing the current status of the Puget Sound chinook salmon, the environmental baseline for the action area, and the effects of the proposed STIA actions, the **NMFS concludes that these actions may affect but are not likely to adversely affect Puget Sound Chinook or their designated habitat."**

The Final EIS and the FSEIS disclosed the presence of these species in area streams. Those documents further disclosed the consequences of the project on these species. The biological opinion and concurrence issued by the Services does not contradict these earlier findings.

In addition to the recent listings of various species under the ESA, NMFS recently established requirements under the Magnuson-Stevens Fishery Conservation and Management Act for federal action agencies to consult over activities that may adversely effect designated Essential Fish Habitat (EFH). NMFS designated EFH for coastal pelagic fisheries and Pacific groundfish species, as well as several Pacific salmon species. In accordance with the MSA, the FAA, on behalf of itself and the USACE, prepared an EFH assessment in June 2000 analyzing the impacts of proposed Master Plan Update actions on designated EFH for pelagic fish species and determined that the Master Plan Update projects were not likely to adversely affect designated EFH. In September 2000, NMFS designated EFH for several species of salmon, including chinook, coho, pink, and chum salmon. In March, 2001, the FAA, on behalf of itself and the Corps, prepared a supplemental EFH analysis and determined that the Master Plan Update projects would have no effect on chinook or pink salmon EFH. The analysis further determined the proposed action may adversely affect coho salmon EFH in the short-term, but was not likely to adversely effect coho salmon EFH in the long-term.

Chinook and pink salmon have not been documented to occur in the Miller or Des Moines Creek basins upstream of their discharge with Puget Sound; therefore, construction and operations of the project will have no adverse effect on freshwater EFH of chinook or pink salmon in the Miller Creek or Des Moines Creek basins. Coho salmon are present within central and lower reaches of Miller, Walker, and Des Moines creeks and may be present in several areas where direct impacts could occur from construction of habitat improvements (e.g., installation of large woody debris, removal of rock weirs), and/or water quality alteration from turbidity, suspended sediment, or stormwater chemistry. When the potential effects of the proposed Master Plan Update improvements on the EFH of coho salmon in the project area were considered relative to the proposed conservation measures, the action agencies determined that the proposed action "may adversely effect" coho EFH in the short-term, but will be unlikely to adversely affect coho salmon EFH for the long-term and will actually prove beneficial to this species. On May 31, 2001, NMFS concurred with the EFH assessment for pelagic and groundfish species and noted "Information submitted by FAA in the BA is sufficient for NMFS to conclude that the effects of the proposed actions are transient, local, and of low intensity and are not likely to adversely affect EFH in the long-term." These findings are consistent with the 1996 Final EIS and 1997 FSEIS.

II. EXISTING NEPA DOCUMENTS

Several documents were prepared by or under the FAA's direction to comply with the National Environmental Policy Act (NEPA). These documents, which are herein incorporated by reference include:

- *Record of Decision for the Proposed Master Plan Update Development Actions at Sea-Tac International Airport*, July 3, 1997
- *Final Supplemental Environmental Impact Statement for the Proposed Master Plan Update Development Actions at Seattle-Tacoma International Airport,* May 1997
- *Final Environmental Impact Statement for the Proposed Master Plan Update Development Actions at Seattle-Tacoma International Airport*, February 1996

The following sections briefly summarize the contents of these documents relative to wetlands and threatened and endangered species.

A. 1996 FINAL ENVIRONMENTAL IMPACT STATEMENT (FEIS)

The 1996 Final EIS examined threatened and endangered species of flora and fauna, as well as plants and animals (including fisheries) in the airport area, and identified the effects of the project on conditions at that time.

(1) Threatened and Endangered Species of Flora and Fauna

The Final EIS noted the potential for use of the area of the proposed Master Plan Update alternatives by bald eagle, peregrine falcon, marbled murrelet, pileated woodpecker, and great blue heron, as well as several federal candidate species that were listed by the Services as of June 1994. Federal candidate species at that time that could potentially occur in the airport area were: bull trout, black tern, mountain quail, northern red-legged frog, northwestern pond turtle, and spotted frog. A BA was prepared in April 1995 for all federally listed, proposed, and candidate species, in consultation with the FWS Service, as was provided in the Final EIS in Appendix K (volume 3). The BA found that marbled murrelets were unlikely to be affected, as "appropriate habitat for these species does not exist" in the action area. On December 6, 1995, FWS concurred with the "not likely to adversely affect" finding made in the April 1995 BA. Based on that analysis, no significant impacts on threatened and endangered species were expected as a result of the proposed Master Plan Update.

(2) Biotic Communities (Plants and Animals)

The endangered species section of an EIS addresses the specific species of flora and fauna that are listed by the Services as threatened or endangered. A section entitled "Biotic Communities" or "Plants and Animals" is then prepared to disclose the project effects on species that are not threatened or endangered. When considering plants and animals, consideration was given to vegetation, wildlife, and fish and aquatic resources.

Approximately 40 percent of the study area considered by the analysis is occupied by Sea-Tac Airport and is characterized by frequently mowed grassland bisected by service roads and taxiways. This area provides little wildlife habitat value. Wildlife habitat surrounding the airfield consists of fragmented habitat, which is composed of forest, shrub, and grassland with scattered wetlands. These areas are subject to a variety of airport-related disturbances as well as increasing residential, commercial, and industrial development. The following paragraphs briefly summarize the findings of the Final EIS:

Vegetation: No rare plants, high-quality native wetlands, or high-quality native plant communities listed by the Washington Department of Natural Heritage Information System are located in the study area. Upland vegetative communities consist of grassland, shrub, deciduous forest, coniferous forest, and mixed deciduous/coniferous forest. Eight habitat types were distinguished: grassland, managed lawn, pasture, row crop, mixed shrub, coniferous forest, deciduous forest, mixed forest, mixed vegetation classes, and wetland. Seven streams were

identified: Miller, Walker, and Des Moines creeks (including two un-named tributaries), Gilliam Creek, and the Green/Duwamish River.[2/]

The primary effect on vegetation communities from the projects is construction that will result in the direct removal of vegetation. Loss of plant communities that offer limited habitat value, such as managed grassland, result in less of an adverse effect than loss of more complex vegetation associations, such as mature forests, wetlands and riparian zones.

Wildlife: Wildlife habitat within the Airport vicinity has been highly modified through urbanization and residential development. Much of the study area is protected from human and domestic animal intrusion through restricted access and fencing. Vegetation communities provide habitat for several species of terrestrial and aquatic wildlife. Wildlife diversity is generally related to the structure and plant species composition within these vegetative communities. When considering habitat value from a regional perspective, the relatively undisturbed vegetation communities in the area offer valuable habitat for wildlife.

Construction activities associated with the project would result in the displacement of wildlife species. Highly mobile animals such as large mammals and birds are able to move away from disturbances into nearby habitats. It is generally assumed, however, that these habitats are at or near carrying capacity and these animals would be required to compete for already limited resources. Less mobile animals such as small mammals, amphibians, reptiles, young animals, and nesting birds, would most likely perish during construction. Disturbance caused by construction activities may have an adverse impact on wildlife by disrupting feeding and nesting activities. Clearing and grading activities in the South Borrow Area, adjacent to the large forested tract that encompasses Des Moines Creek Park could have an impact on breeding wildlife. This habitat is used extensively by neotropical migrant and resident songbirds for breeding. Significant noise disturbance, especially in this relatively undisturbed area of the site, could cause birds to abandon their nests.

Construction activities could have adverse effects on wildlife populations in aquatic habitats. The Final EIS estimated that approximately 10 acres of wetland loss would occur as a result of filling and grading. A variety of small mammals and amphibians would be directly impacted by this loss because they rely on these areas for foraging, breeding, and over wintering habitat. Because of their limited mobility, these taxa would likely perish during construction activities. Many of the aquatic habitats have been previously degraded by activities such as construction, fuel spills, and refuse dumping. Exposing soil and removing vegetation could result in an increase in sediments and other non-point pollutants entering adjacent wetlands, contributing to further degradation of aquatic habitat. Many amphibian species are sensitive to pollutants, and water quality in aquatic habitats on the site may be a limiting factor for some of these species.

The conversion of one habitat type to another, such as forested tracts to managed grassland, can have a profound effect on the complement of wildlife species using an area. Loss of forested parcels in the study area would further stress those species dependent on forested habitats because these species would be displaced to similar habitats elsewhere. Increasing urbanization over the past 15 years has fragmented existing forested tracts and greatly reduced the area of forest habitat available for wildlife. The effects of habitat fragmentation on wildlife have been well documented for birds, but recent studies have been conducted with other taxa. In general, the number of species using a particular habitat decreases as the distance between patches of habitat increases (i.e., fragmentation of habitats typically results in loss of species). Studies with birds have shown that smaller patches of habitat, with proportionately more edge, may be associated with increased predation and nest parasitism.

[2/] Communication with Sandra Norwood, Washington Natural Heritage Program, Division of Land and Water Conservation. January, 1995.

The long-term effect of conversion of one successional habitat to another is a shift in the local carrying capacity. Species such as American robin, European starling, house sparrow, raccoon, opossum, and deer mouse that utilize grasslands and more urbanized habitats would likely increase after construction of the proposed Master Plan Update, and species that utilize older, more complex successional stages would experience population decreases due to habitat loss.

Fisheries and Aquatic Resources: Although urbanization has significantly altered channel morphology and fish habitat, Miller, Walker, and Des Moines Creeks continue to support populations of resident and anadromous fish and associated aquatic biota. Historically, Miller and Des Moines Creek basins supported large runs of coho salmon (*Oncorhynchus kisutch*) and perhaps small runs of chum salmon (*O. keta*).[3] Presently, both basins support only small runs of coho salmon, which appear to be maintained by annual releases of hatchery-reared fingerlings raised by the Des Moines Salmon Chapter of Trout Unlimited. Washington Department of Fish and Wildlife (WDFW) has not conducted any spawner surveys in either Miller or Des Moines Creeks since 1985; no spawning coho were observed in the 1985 survey.[4] The Des Moines Salmon Chapter of Trout Unlimited reported about 91 fish in a recent coho spawner survey conducted on Miller Creek.[5] There is no known chum salmon, Puget Sound pink salmon, or steelhead trout use of either creek system.[6,7] Barriers to upstream fish passage appear to limit salmon in Miller Creek to the area below the culvert at 1st Avenue S. (about 2.8 miles) and in Des Moines Creek to the area below S. 200th Street (about 2.5 miles).

In addition to anadromous fish, both Miller and Des Moines Creeks support resident populations of cutthroat trout (*O. clarki*) and pumpkinseed sunfish (*Lepomis gibbosus*).[8] Des Moines Creek also supports resident populations of rainbow trout (*O. mykiss*), bluegill (*Lepomis macrochirus*), black bullhead (*Ictalurus melas*), and largemouth bass (*Micropterus salmoides*). In addition, Miller, Walker, and Des Moines Creeks likely support small populations of native nongame fishes, including sculpin (*Cottus* sp.), and other nongame fishes introduced to the area. Electrofishing conducted in Des Moines Creek in four reaches (one downstream and three upstream of S. 200th Street) captured five rainbow trout, 13 bluegill, 17 black bullhead, and two largemouth bass.[9] Bluegill, bullhead, and largemouth bass appear to be restricted to the Northwest Ponds, Bow Lake and slower water habitats at the Tyee Valley Golf Course. In a recent (October 1994) electrofishing survey at seven locations on Des Moines Creek between Marine View Drive and S. 200th Street, a total of 50 salmonids were captured, including 48 cutthroat trout ranging from about 3 to 13 inches and two juvenile coho salmon.[10] Lengths of juvenile coho were not reported. Cutthroat trout were captured at all seven locations, but juvenile coho were captured only at the most downstream station. In addition, 14 pumpkinseed sunfish were captured, ranging from about 1.5 to 2.5 inches. The source of pumpkinseed sunfish, which were caught at six of the seven sampling locations, is likely Bow Lake and the Northwest Ponds upstream of S. 200th Street. Although no comprehensive population studies

---

3/ *Catalog of Washington Streams and Salmon Utilization*. Williams, R.W., R.M Laramie, and J.J. Ames. Washington Department of Fisheries. 1975.

4/ Personal communication by EIS consultant with Joe Robel, Fisheries Biologist, Washington Department of Fish and Wildlife. August 8, 1994.

5/ Personal communication by EIS consultant with Allen Miller, Restoration Coordinator, Des Moines Salmon Chapter of Trout Unlimited. July 18, 1994.

6/ Personal communication by EIS consultant with Joe Robel, Fisheries Biologist, Washington Department of Fish and Wildlife. August 8, 1994.

7/ Personal communication by EIS consutlant with Phil Schneider, Fisheries Biologist, Washington Department of Fish and Wildlife. August 18, 1994.

8/ Personal communication by EIS consultant with Alan Johnson, Aquatic Scientist, Aquatic Resource Consultants, November 12, 1994.

9/ *South Aviation Support Area Final EIS*. Port of Seattle. 1994.

10/ Personal communication by EIS consultant with Alan Johnson, Aquatic Scientist, Aquatic Resource Consultant, August 18, 1994.

have been conducted on either creek, recent electrofishing surveys conducted on Des Moines Creek and limited observations made on Miller Creek suggested that these creeks support relatively small populations of salmonid and nongame fish species.

Potential construction impacts on fish and aquatic biota would be both short- and long-term in nature. If not effectively mitigated, erosion of exposed surfaces at construction sites could contribute to temporary increases in total suspended solids and sedimentation in Miller and Des Moines Creeks. As stated in the Final EIS: "Potential long-term impacts on fish and aquatic biota would result from planned fill activities." The Final EIS estimated that about 3,700 feet of Miller Creek and its tributaries would be realigned and relocated, including about 980 feet of Miller Creek and 440 feet of the tributary south of Lora Lake. This entire 980-foot section of Miller Creek is adjacent to the Vacca Farms and has a ditch-like character with a sandy bottom. About 200 feet of Des Moines Creek tributary 0377, a Class 3 intermittent stream, would require relocation to complete the extension of Runway 34R. The development of the South Aviation Support Area would require relocation of 2,200 feet of open channel of tributary 0377, a Class 3 intermittent segment of Des Moines Creek.

As stated in the Final EIS (IV.16-10) "Potential operational impacts on fishery and aquatic resources could also include adverse effects on water quality and water quantity (i.e., hydrology). Reduced groundwater recharge and reduced base flows could occur in Miller and Des Moines Creeks as a result of the proposed Master Plan Update alternatives. All new runway length options would result in increased impervious surface area, contributing to reduced groundwater recharge and possibly reduced base flows in the creeks. Reduced base flows, if significant, could adversely affect stream temperature and dissolved oxygen levels. Exceedingly high temperatures (above 70°F) and low dissolved oxygen (below 6 mg/L) could be lethal or have other adverse effects (e.g., reduced growth) on salmonids and other aquatic biota. It is unlikely that base flow reductions that could be caused by the "With Project" alternatives would contribute to lethal temperatures or dissolved oxygen levels because possible reductions would not be significant and reductions would be offset by mitigation.

B. FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT (FSEIS)

In May 1997, the Federal Aviation Administration (FAA) issued a FSEIS for the Master Plan projects based on new information that had arisen upon completion of the Final EIS in February 1996 and beginning their preparation of a record of decision. New information included new airport activity information, leading to a new phasing plan for the projects, as well as new information concerning the wetland effects of the Master Plan projects. Issues addressed in the FSEIS included: forecasts of aviation demand, impact of the forecasts on project purpose and need, impact of the forecasts on alternatives, updated affected environment, and the environmental consequences of this new information. The environmental disciplines that were affected by the new information included: surface traffic conditions, air quality, noise impacts, construction impacts, biotic communities, wetlands and floodplains, land use-related impacts, etc.

Relative to wetlands, floodplains, and biotic communities, the FSEIS noted:

> "Since the issuance of the Final EIS, information concerning two key areas has been produced:

- Submission of the wetland fill Joint Aquatic Resource Permit Application (JARPA) Section 404 permit application to the U.S. Army Corps of Engineers and further definition of wetland mitigation and Miller Creek relocation mitigation; and
- Survey of raptors in the area of the third runway.

In December 1996, the Port submitted an application to the Army Corps of Engineers for a permit to fill wetlands at Sea-Tac Airport associated with the Master Plan Update improvements in compliance with the Clean Water Act, Section 404. The 404-permit application submitted to the Corps of Engineers includes a completed Joint Aquatic Resources Project Application (JARPA) form, in a report entitled 'JARPA Application for Proposed Improvements at Seattle-Tacoma International Airport' dated December 1996."

The Final EIS noted that about 10.4 acres of wetland would be filled in order to complete the proposed improvements. Between issuance of the Final EIS and preparation of the FSEIS, the Port refined its evaluation of the projects affecting wetlands. Relative to the Final EIS, the FSEIS included identification of about 2 additional acres of wetland impacts, documented the review of in-basin mitigation options, and further defined plans for development of a wetland mitigation site in Auburn.

As is noted throughout the Final EIS and FSEIS, airports have a responsibility for instituting wildlife protection measures if wildlife hazards exist at or in the vicinity of an airport. Because of actual wildlife hazard issues arising from bird strikes, the Port cannot commit to maintaining sites on or near the Airport as wetland habitat mitigation in perpetuity. If a wetland site were to become a safety concern because of its attraction to wildlife, particularly birds, and jeopardize aircraft safety, the Port would be compelled to remove the hazard, including flora and/or fauna. To mitigate for the unavoidable impacts to wetlands, the Port proposes to create new wetlands on a 47-acre site of an approximately 69-acre parcel located within the city limits of Auburn, Washington. Wetland mitigation at the Airport, within the watersheds where the impacts may occur, is not feasible for three reasons: (1) most of the area surrounding the Airport is developed, and not enough available land exists in the watershed to create compensatory mitigation wetlands without relocation of additional business and residences; (2) we have taken the position that "wildlife attractions" within 10,000 ft of the edge of any active runway is not recommended; and (3) wildlife control activities in wetlands near the airport would conflict with wetland habitat mitigation goals. However, the hydrologic functions the wetlands perform would be replaced at the airport site with the proposed storm water management facilities, and relocation of the drainage channels, and relocation of affected portions of Miller Creek.

In addition, the Port performed a follow-up review of the west side of the airfield to determine if raptors (such as the red-tailed hawk) were nesting in the area. This survey indicated that no nesting occurs, but that raptors forage in the airport area.

III. NEW BIOLOGICAL INFORMATION THAT HAS ARISEN SINCE ISSUANCE OF THE FINAL SUPPLEMENTAL EIS AND RECORD OF DECISION

Since the issuance of the Record of Decision, the Federal Aviation Administration and the Port of Seattle have considered the following natural resource-related issues:

- Additional wetlands identified subsequent to access to the acquisition area
- Possible effects of the project on newly listed species of threatened and endangered species and designated critical habitat
- Effects to bird species protected under the Migratory Bird Species Act
- Possible effects of the project on Essential Fish Habitat

The following sections describe the new information that has been identified.

A. WETLANDS

The analysis of wetland impacts in the 1996 Final EIS and 1997 FSEIS was based on wetland delineations that have been revised recently as the Port has acquired, and gained access to, approximately 390 parcels of land where Master Plan Update improvements will be located. The FSEIS identified a total of 12.33 acres of wetlands that would be affected by Master Plan Update improvements. Of this total, 7.38 acres were identified as affected by the Runway (including embankment and borrow sources), 2.34 acres by the Runway Safety Areas, and 2.51 acres by terminal and landside improvements. In January 2000, the Port issued an addendum under the Washington State Environmental Policy Act (SEPA) entitled "*Addendum To Final Environmental Impact Statement and Final Supplemental Environmental Impact Statement For Proposed Master Plan Update Development Actions at Seattle-Tacoma International Airport*". This document is incorporated herein by reference.

Upon completion of the EIS process, the Port decided to proceed with the Airport improvements and received the approval of the FAA in its 1997 ROD. The Port then initiated acquisition of property. As land was acquired and on-the-ground wetland studies were conducted, the Port found that the project would affect more wetland area than previously identified in the 1997 FSEIS. Based on the refined identification of wetlands in the study area, a revised impact analysis was prepared. Under the revised wetland impact analysis, the wetland acreage affected by the project had increased from 12.23 acres to 18.37 acres. Of this revised total, 14.23 acres would be affected by the Third Runway Project Area, 1.10 acres by the Borrow Area and Haul Road, 0.12 acre by off-site mitigation, 0.14 acre by the Runway Safety Areas, and 2.78 acres by South Aviation Support Area (SASA) improvements. The refined analysis also identified 2.05 acres of wetlands that would be temporarily affected by construction activities and approximately 40 acres of wetlands that would be modified, primarily beneficially, as a result of wetland mitigation measures. Because the value of wetlands is determined more by their environmental function than their acreage, the revised wetland impact analysis summarized in the revised impact assessment report focuses on impacts to wetland functions rather than simply the affected acreage. **Table 1** compares by wetland the acreage impacts identified in the FSEIS with those identified upon access to the acquired properties.

While differences exist due to the changes in the quantity of wetlands now identifed, in general, the functions and values of the affected wetlands identified since the FSEIS are the same as wetlands identified in the Final EIS and FSEIS. The refined delineation identified additional affected wetlands but did not identify any additional or unrecognized biological functions in the area. Wildlife use of the study area and its associated wetlands is largely limited to species tolerant of disturbance. The study area is fragmented by urban development, which limits access to the area for most large mammals. Faunal diversity is frequently limited in wetlands because they are too small to meet habitat requirements for many wildlife populations. The high degree of urbanization within the area may limit the numbers and diversity of amphibians present.

The forested wetlands within the study area are predominantly slope wetlands and lack true aquatic habitat. The wildlife function of these wetlands is similar to that of forested upland areas with comparable vegetation communities. Small passerine birds use forested habitat in the study area for nesting and feeding. Forested areas are also used by small mammals for breeding and cover. Some amphibians may use portions of the wetlands for resting, foraging, and breeding.

The physical functions provided by the newly identified wetlands are of the same general quality and significance as those wetlands identified in the FSEIS. Hydrologic functions (flood storage, groundwater discharge, and storm water detention) that affect hydrologic and habitat conditions in both on-site and off-site locations (especially fish habitat in Miller and Des Moines creeks) are not different from the FSEIS evaluation.

B. THREATENED AND ENDANGERED SPECIES OF FLORA AND FAUNA

Since completion of the FSEIS and issuance of the Record of Decision, bull trout and chinook salmon, species that inhabit the vicinity of Sea-Tac International Airport, were federally listed as threatened. Critical habitat was subsequently designated for chinook salmon. In April 2000, FAA reinitiated consultation with the FWS and initiated consultation with NMFS. In June 2000, FAA submitted a BA to the Services which addressed the following species: threatened bald eagle (*Haliaeetus leucocephalus*), threatened marbled murrelet (*Brachyamphus marmoratus*) and marbled murrelet critical habitat, threatened Coastal/Puget Sound bull trout (*Salvelinus confluentus*), threatened Puget Sound chinook salmon (*Oncorhynchus tshawytscha*), and chinook critical habitat. The bald eagle, which was initially evaluated in the 1995 Biological Assessment, was re-evaluated in the June 2000 BA. In August 1999, the peregrine falcon was delisted, so no evaluation was required for the June 2000 BA.

Section 7 of the ESA, 16 U.S.C. §§ 1531 *et seq.*, requires federal agencies to ensure that their actions do not jeopardize the continued existence of listed species, or adversely modify their critical habitat. The effects of the project on these species were evaluated in the BA submitted to the Services in June 2000. The BA concluded that the proposed actions "may affect, but are not likely to adversely affect" the bald eagle, marbled murrelet and marbled murrelet critical habitat, Puget Sound chinook salmon and designated critical habitat, and coastal/Puget Sound bull trout. Based on information contained in the Biological Assessment, FWS rendered a biological opinion and NMFS issued a concurrence letter that concurred with the conclusions of the FAA's Biological Assessment. **Attachment A** to this report is a copy of the BO and concurrence letter from the Services.

The Biological Assessment "action area" for the proposed Master Plan Update projects was determined to be the area of the airport project construction and vicinity, where direct and indirect effects could reasonably be expected to occur (i.e., the aquatic habitat of Miller, Walker, and Des Moines creeks downstream of the airport and the associated nearshore estuaries, and the IWS Puget Sound outfall), as well as the Auburn wetland mitigation site and vicinity.

As noted in the Final EIS, bald eagles forage and perch in the "action area" and could be affected by loss of habitat and foraging opportunities. The construction and operation of the Master Plan Update projects is not expected to adversely affect local bald eagles. This report agrees with previous assessments, that the project "may affect," but is "not likely to adversely affect" bald eagles in the vicinity of Miller and Des Moines creeks. Because the nearest active bald eagle nest is beyond one-half mile of the Auburn wetland mitigation site, wetland construction activities associated with this site will have no effect on breeding bald eagles. Because wetland landscaping and construction mobilization activities could occur during the bald eagle wintering period, but more than 200 ft from the Green River, activities "may affect," but are "not likely to adversely affect" wintering eagles. Construction of the Auburn mitigation site is anticipated to provide habitat for waterfowl and wintering eagles. Thus, the overall determination for the Master Plan Update projects is "may affect", but is "not likely to adversely affect" bald eagle.

In its BO, FWS found the following with regard to the bald eagle:

- The proposed action is unlikely to result in significant impacts to bald eagles.
- Impacts are expected to be minor since no bald eagle nesting territories occur within the action area and no potential nest trees will be removed.
- Additionally, since no additional habitat is provided by the proposed airport facilities, flight paths of bald eagles over the airport are not anticipated to increase due to the proposed project.
- Runway 34R, which is the runway closest to Angle Lake, will be extended by 600 ft. Although there is a risk of collisions of bald eagles with airplanes due to the extension of this runway, the risk is anticipated to be minimal due to the few additional flights which will use this part of the runway over existing conditions.
- Although there is a risk of an air strike of a bald eagle at Sea-Tac, FWS does not believe that this risk is significantly increased as a result of the proposed action. In reaching this conclusion, FWS noted that no air strikes of bald eagles have been reported to date at Sea-Tac.
- The risk of airplane strikes of bald eagles from their use of thermals associated with the retaining wall is expected to be minimal.

The marbled murrelet is not likely to be present in the action area, but has been observed about 1.5 or more miles away. Based on the rarity of marbled murrelets in marine waters near the Airport, the distance between the Airport and Puget Sound, the water quality protection incorporated into the Master Plan Update, and the remote probability of an aircraft striking a marbled murrelet, it was determined in the BA that the project would have "no effect" on marbled murrelet or marbled murrelet critical habitat. In subsequent correspondence with FWS, FAA clarified that in some unlikely circumstances, the action may affect, but would not adversely affect this species.

In the BO, FWS found the following with regard to marbled murrelet:

- The proposed project is likely to result in insignificant impacts to marbled murrelets. Suitable marbled murrelet nesting habitat does not occur within the action area, including the off-site mitigation area.
- Although the proposed project may result in some short-term impacts to potential prey species (i.e., salmonids) that occur within Miller and Des Moines Creeks, salmonids are not known to form the primary diet of marbled murrelets.
- There is a potential for a long-term benefit to marbled murrelets should the proposed mitigation successfully enhance fish habitat and result in increased fish production within these creeks. However, as stated above, this benefit is likely to be minor as salmonids do not form the primary diet of the marbled murrelet.
- Impacts from air strikes are unlikely. The majority of marbled murrelet sightings and detections for nesting and foraging are north and south of the project area. Their travel paths are unlikely to cross the airport between nesting and foraging locations.

The Puget Sound chinook salmon was listed as a threatened species in March 1999, and a final rule designating critical habitat was issued in February 2000. Designated critical habitat includes all Puget Sound waters, estuaries, and freshwater habitats accessible to Puget Sound chinook salmon, including the Duwamish hydrologic units. Portions of Miller and Walker creeks fall within the strict definition of critical habitat, as no physical barriers restrict accessibility of this water body to chinook salmon. Based on NMFS' description of necessary habitat characteristics and the absence of data supporting any historic presence of chinook salmon upstream of the estuary, the BA concluded that Miller and Walker creeks do not constitute chinook critical habitat. Similarly, Des Moines Creek appears to lack suitable spawning habitat and historically has not been used by chinook salmon. The Green River, adjacent to the Auburn mitigation site, and the vicinity of the IWS Outfall in Puget Sound are critical habitat for chinook salmon.

NMFS concurred with the BA findings in its concurrence letter issued May 31, 2001. NMFS states:

- STIA projects will have temporary and long-term impacts to the aquatic habitat in Miller, Walker, and Des Moines Creeks.
- Less substantial impacts are expected to occur in Gilliam Creek, the estuaries of Miller and Des Moines Creeks, the outfall of the Midway Sewer District and in the Green River during construction of the offsite mitigation wetland. Potential impacts include changes in water quality, alterations to hydrologic conditions and alterations to wetland and stream habitats.
- Numerous conservation measures are proposed to reduce and minimize potential adverse impacts.
- Since there are no chinook salmon, or critical habitat for chinook salmon, in Miller, Walker or Des Moines Creeks, STIA projects in these watersheds will have no direct effects to threatened Puget Sound chinook. The only potential indirect effects will occur in the estuaries of Miller and Des Moines Creeks and are expected to be insignificant or discountable.
- Effects of STIA projects are also insignificant or discountable for Gilliam Creek, the Midway Sewer outfall and the Green River. Consequently, NLAA (not likely to adversely affect) is the appropriate determination for the project.

On November 1, 1999, bull trout was federally listed as a threatened species. Critical habitat for bull trout was deemed "not determinable" by the FWS due to inadequate understanding of the

biological needs of the species. Because bull trout critical habitat has not been designated, the effects on such habitat are impossible to ascertain.

Relative to bull trout, the FWS BO found:

- The subpopulation of bull trout in Puget Sound, Miller and Des Moines Creek estuaries, and the Green River is likely composed of individuals from other spawning streams in the Coastal/Puget Sound DPS (distinct population segment). Bull trout spawning and rearing habitat are not known to be present in Puget Sound, Miller, Des Moines, Walker, and Gilliam Creek, or the mainstem Green River at this time. Therefore, bull trout spawning and rearing habitats are unlikely to be affected by the proposed project. Bull trout habitats that could be affected, therefore, are primarily foraging and migratory habitat.
- There are potential long-term and short-term direct and indirect effects to bull trout from the proposed project. These impacts include a potential reduction of forage species, exposure of bull trout to contaminants through surface water and consumption of contaminated forage species, and physical effects due to sediment. However, due to proposed water quality measures during construction, potential water quality improvements over baseline conditions, minimal exposure to potential contaminants, and the very low likelihood for bull trout to be present during construction or in proximity to the affected areas, FWS believes that the proposed impacts are not likely to be significant.

Indirect Effects:

Because project construction will not directly alter designated critical habitat for chinook salmon and bull trout species, the BA effects analysis focused on indirect effects of the action on these species as a result of impacts to their habitat. Relative to Coastal/Puget Sound bull trout and Puget Sound chinook salmon, the Biological Assessment examined:

- water quality impacts and mitigation,
- hydrologic impacts and mitigation, and
- aquatic habitat impacts and mitigation.

As a result of the analysis, the Services found that the project "may affect", but is "not likely to adversely affect" chinook salmon, chinook designated critical habitat, or bull trout. No impacts were identified in the BA, BO, or concurrence letter that had not been disclosed in the Final EIS or FSEIS.

Water Quality: Potential water quality impacts to Miller and Des Moines creeks resulting from construction and operation of the Master Plan projects and mitigation include construction-induced sedimentation, as well as sediment and erosion control practices that themselves may result in potential impacts (i.e., changes in stream temperature and pH, release of flocculation agents, and changes in low and peak flows). Potential water quality impacts include changes in stormwater quality and quantity associated with increased impervious surfaces, airport anti-icing and de-icing agent use, application of nutrients and pesticides to landscape management, and hydrology changes affecting Miller/Walker and Des Moines creeks. Upon completion of the projects, continued airport operations could affect water quality through discharge to adjacent creeks of conventional pollutants and chemicals used in ground and aircraft de-icing, and discharge of these same chemicals to the Puget Sound IWS. Overall, the projects will result in a

greater volume of stormwater undergoing detention and treatment. Stormwater treatment will be accomplished through retrofitting (rebuilding) areas, as well as detaining and treating all stormwater associated with new impervious surfaces. An additional result of retrofitting will be reductions in copper and zinc currently discharged to Miller, Walker and Des Moines creeks. The concentrations of these pollutants i he creeks will either be unchanged from existing conditions or lower than stormwater currently discharged from areas lacking water quality treatment. Therefore, the proposed projects will not increase the exposure of chinook salmon or bull trout to copper or zinc in the estuaries of Miller or Des Moines creeks. Similarly, in the unlikely event that either adult chinook salmon or bull trout migrate into these creeks, their exposure to these chemicals after the project would be the same as current (baseline) conditions.

The effect of stormwater runoff on chinook designated critical habitat downstream of the Port discharge points was also assessed through toxicity testing of Miller Creek and Des Moines Creek downstream of the Airport outfalls. These tests demonstrated no toxicity to either flathead minnow or the invertebrate *Daphnia pulex*. In addition to stream samples, whole-effluent toxicity (WET) testing of Airport stormwater discharges was performed using these same test organisms. These tests demonstrated an absence of toxicity in samples consisting of 100 percent stormwater from Port discharges, reflective of future conditions after the projects are completed.

All identified water quality impacts will be mitigated by establishing and maintaining water quality treatment best management practices (BMPs). These BMPs not only protect listed species and designated critical habitat, but they also meet or exceed the requirements of the Washington State Department of Ecology's 1992 Stormwater Management Manual. Additionally, existing developed areas lacking BMPs consistent with the manual will be retrofitted by the Port with water quality treatment BMPs to further protect listed species and their habitat. The Master Plan Update projects will treat both new pollutant-generating impervious surface and existing impervious areas in a ratio of 1:1.89 (for each acre of new impervious surface, all new runoff will be treated and an additional 0.89-acre of existing impervious surface will be retrofitted). Additional measures to mitigate water quality impacts include source control and the operation and expansion of an IWS to treat stormwater runoff generated from high-use areas.

In addition to the proposed water quality BMPs, existing degraded wetlands in the Miller Creek and Des Moines Creek basins will be enhanced to: restore water quality functions, benefit water quality by eliminating existing pollution sources from agricultural land, increase settling and mechanical trapping of particulates, remove metals and other toxins that bind to particulates, reduce and bind metals in humic materials, biologically remove and uptake nutrients, and enhance the Miller Creek buffer.

Hydrologic Impacts: The Master Plan Update projects will increase impervious surface areas in the Miller and Des Moines Creek watersheds (by less than four percent), which could further increase stormwater runoff rates, volumes, and pollutant loads to the receiving streams, if unmitigated. Additionally, the filling of wetlands could affect stormwater storage, ground water recharge, and groundwater discharge, all of which could affect the hydrology of surface streams, if unmitigated.

Approximately 326.4 acre-feet of new stormwater detention storage will be needed to mitigate the impacts of increased stormwater runoff associated with the projects. The Port will construct stormwater conveyance, detention, and treatment facilities to manage runoff from both newly developed project areas and existing airport areas, as described below. The net result of flow controls for the Master Plan Update projects will be to reduce peak flows in Miller, Walker, and Des Moines creeks downstream of the airport discharges. These actions will enhance baseline hydrologic conditions in the streams and associated estuaries. The target flow regime will achieve the level of flow control required by regulations and reduce flows in the stream channels to a stable condition that reduces channel erosion and sedimentation in the creek estuaries.

The Port has developed mitigation plans for Miller and Des Moines Creek watersheds to compensate for any potential reduction in low flows in Miller, Walker and Des Moines creeks. The Port's mitigation plan for impacts to streamflow is to detain stormwater in detention ponds and vaults and manage its release to mitigate the low flow impacts of Airport improvements on Des Moines, Miller and Walker Creeks, without the use of additional sources of mitigation water.

Aquatic Habitat Impacts: Aquatic habitat impacts resulting from Master Plan Update improvements include short-term changes in water quality (from turbidity and suspended sediment), water quantity (from diverting flows in two Miller Creek segments), and habitat structures (from vegetation clearing, riparian regrading, and channel reconstruction—including the relocation of 980 ft of Miller Creek). Short-term changes include temporary construction impacts to 2.05 acres of wetlands. Long-term changes include the relocated Miller Creek channel, beneficial habitat features and native riparian vegetation throughout Miller and Des Moines creeks, enhanced riparian buffers, the permanent removal of poor-quality habitat structures and migration impediments, and the filling of 18.37 acres of wetlands.

Several on-site mitigation elements are proposed to compensate for the Master Plan Update improvements' potential impacts to stream, wetlands, and aquatic habitat. The mitigation will establish 67.01 acres of on-site wetland enhancement and stream buffer that will be restored and protected in perpetuity from future development. In-basin mitigation will be directed toward restoring all impacted wetland and stream functions, except avian habitat, and improving stream functions and potential fish habitat. In-basin mitigation also will be directed toward removing certain existing land use conditions (e.g., residential development) that degrade on-site wetland and aquatic habitat. The mitigation package also includes mitigation for wildlife habitat (bird and small mammals) that will be provided out-of-basin and will consist of creating a large, high quality wetland system in the city of Auburn at the mitigation site. Overall, the mitigation package will maintain or enhance critical habitat baseline conditions in the creeks and their estuaries.

C. CANDIDATE SPECIES

Consideration was also given by the FAA to species of fish present in the airport area that are candidates for listing as threatened or endangered. Under the ESA, candidate species are "taxa considered for possible addition to the List of Threatened Species". Joint NMFS and FWS

regulations define a candidate species as any species being considered by FWS or NMFS for listing, but not yet the subject of a proposed rule. See 50 C.F.R. § 424.02.

Section 7 of the ESA does not require federal agencies to evaluate effects of agency actions on candidate species. No candidate species managed by FWS were identified as occurring in the project area. Puget Sound coho salmon (*Oncorhynchus kisutch*) was identified by NMFS as a candidate species occurring in the project vicinity, but it was not required to be evaluated in the Biological Assessment.

A status review of coho salmon was recently completed by NMFS in response to petitions seeking to list several Pacific Northwest populations as threatened or endangered. Despite recent stable trends in population abundance near historic levels, the status of the Puget Sound/Strait of Georgia ESU was determined to warrant further consideration for listing due to concerns over current genetic, environmental, and habitat conditions. Risk factors identified as potentially deleterious to Puget Sound coho salmon stocks included high harvest rates, extensive habitat degradation, unfavorable ocean conditions, and declines in adult size.

Hatchery supplementation in Puget Sound has been extensive. Coho salmon broodstock released into various Puget Sound basins between the early 1950s and 1981 were from the Green River and several other rivers to the north. Coho salmon in the Green River basin are a mixture of native and hatchery origin fish. Substantial releases of hatchery coho have occurred throughout the Green River basin since the early 1950s.

In addition to natural spawning that occurs in the basin, Trout Unlimited operates a small hatchery on Miller Creek from which volunteers scatter-plant coho juveniles throughout Miller, Walker, and Des Moines creeks. The egg sources for this hatchery are Green River hatchery stocks maintained by the State of Washington and the Muckleshoot Indian Tribe.

The historical record indicates that coho ascended Miller Creek to a waterfall at RM 2.8. The waterfall has been described as a complete barrier to upstream migrations of anadromous fish and confirmed as a migratory barrier by Trout Unlimited during recent spawning surveys. Surveys in 1980 found sparse numbers of coho spawning between the mouth of Miller Creek and RM 1.4, with four live spawners, seven dead spawners, and nine redds observed. Coho salmon also occur in Walker Creek.

In Des Moines Creek, coho ascended to at least RM 1.5 (possibly beyond). Annual returns of coho to Des Moines Creek are not known, but in Miller Creek total about 300 adults per year. Based on estimates of the pre-development carrying capacity of Miller Creek, the historical coho run size may have ranged from 700 to 1,200 adult fish per year. Coho salmon in Des Moines Creek consist of native and Green River hatchery-origin fish. Hatchery plantings are conducted by Trout Unlimited.

Currently, NMFS has not designated critical habitat or proposed listing Puget Sound coho salmon. Recently, NMFS proposed that critical habitat for Oregon coast coho salmon should include all freshwater "waterways and substrates below longstanding, naturally impassable barriers (i.e., natural waterfalls in existence for at least several hundred years) and several dams

that block access to former coho salmon habitats." Key habitat characteristics for spawning coho includes stable channel and hydraulic features, and un-embedded substrates ranging from 13 to 100 mm.

Neither enhancement actions in the upper reaches of Miller Creek nor minor construction associated with stormwater management facilities will directly affect coho salmon. Instream or riparian habitat improvements that will occur in the lower reaches of Miller Creek (and any reaches of Walker or Des Moines creeks that are accessible to coho salmon) may directly affect juvenile coho during construction. Effects could include stress, injury, or mortality from construction or from efforts to remove fish from construction areas. Some construction in the upper reaches of Miller Creek could indirectly affect coho salmon by short-term impacts to water quality from increased turbidity and sedimentation, although the relocation of Miller Creek will occur upstream of reaches accessible to coho salmon and thus will not directly affect coho. Erosion control techniques and a temporary bypass will be used during construction of the new channel to limit sedimentation and other water quality impacts that could affect downstream habitat. Following construction, improved habitat conditions in Miller, Walker, and Des Moines creeks will be available to coho. In general, the effects from potential construction and operational activities that were described in the Final EIS and FSEIS on fish residing in Miller, Walker, and Des Moines creek are consistent with potential effects discussed in this document for coho salmon.

Long-term benefits to coho in Miller and Des Moines creeks are expected as a result of in-basin mitigation. Riparian restoration and stormwater improvements associated with the proposed action will assist in restoring both spawning and rearing habitats for coho salmon in Miller and Des Moines creeks.

Potential downstream effects of the proposed action to marine stages of coho salmon using nearshore marine waters at the estuaries of Miller and Des Moines creeks are unlikely. Strict adherence to BMPs will ensure protection of nearshore waters from downstream effects during construction phases of the project. No downstream effects on marine habitats, including marine water quality, are expected during the operation of the project, provided stormwater facilities are properly maintained. Improvements in the water quality of Miller and Des Moines creeks and the discharge area of the IWS Outfall are expected to result from increased riparian restoration and stormwater treatment.

Coho salmon occur in all accessible reaches of the Green River basin. Potential project effects from construction on salmon were described in the June 2000 *Biological Assessment and Pacific Coast Salmon Essential Fish Habitat Assessment for Master Plan Update Improvements at Seattle-Tacoma International Airport* and March 2001 *Salmonid Essential Fish Habitat Assessment.* Adherence to BMPs and specified project timing during construction phases will ensure that no direct impacts to freshwater stages of coho salmon would result from construction or operations.

Most of the existing Miller Creek and Des Moines Creek watersheds are developed, and lack adequate stormwater management facilities. The proposed action will develop new or retrofit existing stormwater facilities to meet or exceed current standards. These actions will likely

improve or maintain habitat quality for coho salmon. For example, some residential neighborhoods contain failing septic systems and failing underground storage tanks that contribute to water quality degradation. These failing neighborhood septic systems and underground tanks will be removed and/or remediated, resulting in measurable improvements to water quality in Miller and Des Moines creeks.

Future projects may result in re-development of areas in existing residential land use to other uses that may, in some cases, remove pollutant sources from Miller and Des Moines creeks. Re-development may also provide opportunities to improve stream buffers or sub-standard culverts that degrade fish habitat. These conditions could be enhanced under re-development scenarios, and further reduce the potential from cumulative impacts that could result from other development projects in the Miller and Des Moines creek watersheds. Long-term effects on downstream habitats, including estuarine areas of Miller and Des Moines creeks, are not expected due to increased stormwater treatment in the basin that will result from the proposed action, and that will be imposed on future projects developed in the basins.

D. COMMERCIALLY MANAGED SPECIES AND ESSENTIAL FISH HABITAT

Congress passed the Sustainable Fisheries Act (SFA) on October 11, 1996, amending the Magnuson-Stevens Act, which contained Essential Fish Habitat (EFH) provisions for commercially managed species. The EFH provisions require that each Federal agency consult with the Secretary with respect to any proposed or final action authorized, funded, or undertaken that may adversely affect any designated essential fish habitat. Essential fish habitat is defined by that Act as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The potential effects on three main fisheries were considered: Coastal Pelagic Fisheries, West Coast Groundfish, and Pacific Coast Salmon.

Coastal Pelagic Fisheries: Coastal Pelagic Fisheries species include four finfish [Pacific sardine (*Sardinops sagax*), Pacific mackerel (*Scomber japonicus*), northern anchovy (*Engraulis mordax*), and jack mackerel (*Trachurus symmetricus*)]; however, none is found in Puget Sound. One invertebrate (*Loligo opalescens* – market squid) is found in Puget Sound and near the project area of the Master Plan Update projects. Essential fish habitat for market squid includes water and substrate necessary for the life cycle of this species.

EFH for the coastal pelagic squid fishery is not known to be present in small creeks, such as Miller/Walker and Des Moines Creeks, because all life stages occur in marine waters. EFH for market squid may be found in the estuaries of Miller and Des Moines creeks and near the general area of the IWS outfall.

Strict adherence to BMPs will protect nearshore waters from downstream water quality effects during project construction phases. Stormwater treatment and riparian restoration associated with the project will improve the quality of waters discharges from Miller/Walker and Des Moines Creeks. No downstream project-related effects to market squid EFH are expected during project operations if stormwater facilities are properly maintained. Thus, Master Plan Update

improvements would not impair potential use of EFH by this species. Construction and operations of the project will have no effect on market squid EFH near the project area.

West Coast groundfish: West Coast groundfish make up a diverse set of more than 50 species, including dogfish, ratfish, flat fish, and rockfish. Essential fish habitat for many of these species is present in marine areas near the project area, and includes water and substrate necessary for the life cycles of the species.

EFH for West Coast groundfish is not known to be present in small creeks, such as Miller, Walker, and Des Moines creeks, because all lifestages of these species occur in marine waters. EFH for West Coast groundfish may be found in the estuaries of Miller and Des Moines creeks and near the general area of the IWS outfall.

Strict adherence to BMPs will protect nearshore waters from downstream water quality effects during project construction phases. Stormwater treatment and riparian restoration associated with the project will improve the quality of waters discharges from Miller, Walker, and Des Moines creeks. No downstream project-related effects to West Coast groundfish EFH are expected during project operation if stormwater facilities are properly maintained. Thus, Master Plan Update improvements would not impair potential use of EFH by these species. Construction and operation of the project will have no effect on West Coast groundfish EFH near the project area.

Coastal Pelagic Fisheries species and West Coast groundfish effects determination:

The June 2000 BA evaluated potential effects on EFH from Master Plan Update improvements and concluded that potential direct, indirect, and cumulative effects associated with the project were unlikely to affect EFH. Any cumulative or indirect impacts associated with other projects planned in these basins will comply with existing or emerging development standards required to protect habitat for commercially managed fish species. These standards will protect water quality, stream hydrologic conditions, stream habitat conditions, riparian buffers, and wetlands. With existing and emerging regulations, habitat and water quality conditions in the Miller/Walker Creek and Des Moines Creek watersheds are likely to improve or remain at their current condition, whether or not other development in the watershed occurs. Based on consideration of the EFH requirements of the market squid coastal pelagic species fishery and West Coast groundfish, including potential direct, indirect, and cumulative effects, the BA determined that construction and operation of the proposed improvements will have "no effect" on any identified pelagic EFH in the action area.

Pacific Coast salmon: On September 27, 2000, NMFS adopted Amendment 14 of the Pacific Salmon Fisheries Management Plan that identified and described essential fish habitat for three species of salmon – chinook (*Oncorhynchus tshawytscha*), coho (*O. kisutch*), and Puget Sound pink (*O. gorbuscha*). Essential fish habitat for these species is present in estuarine and marine waters near the project area, and includes water and substrate necessary for the life cycle of these species. Freshwater essential fish habitat is also present near parts of the project area for coho and chinook salmon.

A salmon essential fish habitat (EFH) assessment pertaining to the implementation of Master Plan Update improvements at Sea-Tac Airport was prepared by the FAA, on behalf of itself and the USACE, for consultation with NMFS under Section 305(b) of the Magnuson-Stevens Fisheries Act. This evaluation was undertaken in response to NMFS' recent approval of Amendment 14. The Pacific salmon EFH assessment analyzed the effects of FAA and USACE actions on designated EFH for chinook, coho, and Puget Sound pink salmon. The EFH assessment concluded that the proposed actions would have "no effect" on chinook and pink salmon EFH in fresh, estuarine, or marine waters. The EFH assessment also concluded that the proposed FAA and USACE actions "may adversely affect" coho freshwater EFH for a short-term period, but would have "no effect" long-term on freshwater, estuarine, or marine EFH, and would have a beneficial effect on coho salmon habitat.

Chinook and pink salmon have not been documented to occur in the Miller Creek or Des Moines Creek basins upstream of their discharge with Puget Sound. Construction and operations are not expected to affect the freshwater life stages or EFH of chinook or pink salmon. Although results of these actions are intended to improve baseline habitat conditions for all salmonids in the Miller Creek and Des Moines Creek basins (through increased stormwater management and habitat restoration), future use of the streams by chinook or pink salmon (i.e., through straying from other basins) is unlikely and not expected. Because these two salmon species do not occur in these basins, construction and operations of the project will have no effect on freshwater EFH of chinook or pink salmon in the Miller Creek or Des Moines Creek basins.

When the potential effects of the Master Plan Update improvements on EFH of coho, chinook, and pink salmon estuarine and marine habitats were considered relative to stormwater improvements and the proposed conservation measures, the EFH analysis concluded that the proposed action will have "no effect" in the long-term on designated estuarine and marine EFH for coho, chinook, and pink salmon, even though short-term adverse impacts to coho EFH may occur as a result of project construction.

Puget Sound pink salmon are not part of the Green/Duwamish hydrologic unit; therefore, effects on pink salmon EFH from the proposed projects in the Green River basin were not evaluated. Chinook salmon EFH is found in the Green River and a tributary, Gilliam Creek. When the potential effects of the proposed Master Plan Update improvements on chinook salmon EFH in the project area were considered relative to the proposed conservation and mitigation measures, the action agencies determined that the proposed action would have "no effect" on chinook Green River EFH.

Coho salmon are present within central and lower reaches of Miller, Walker, and Des Moines creeks and may be present in several areas where direct impacts could occur from construction of habitat improvements (e.g., installation of large woody debris, removal of rock weirs), and/or water quality alteration from turbidity, suspended sediment, or stormwater chemistry. A separate water quality analysis was conducted to evaluate the potential effects of ground and aircraft anti-icing and de-icing compounds, as well as copper and zinc, on coho salmon EFH in Miller, Walker, and Des Moines creeks, and near the IWS Outfall. Predicted concentrations for de-icing compounds and zinc in fresh and marine waters were below toxicity thresholds (LC50 at 96 hours), indicating no adverse effects. Predicted concentrations for copper in Miller Creek and near the IWS Outfall were also below the toxicity threshold. Copper concentrations in Des

Moines Creek were predicted above the toxicity threshold for a maximum of 18 days during a 49-year period; however, acute toxicity is not likely to occur because of high dissolved organic carbon concentrations that bind with copper before it can affect fish gills. Therefore, based on this analysis, the EFH assessment concluded that no adverse water quality effects were likely to occur in areas constituting coho salmon EFH.

Short-term direct effects on coho EFH would occur from habitat modification and changes in water quality during construction. Effects would be limited to temporary increases in turbidity and suspended sediment during construction and alteration of poor quality habitat. The potential short-term effects of turbidity and sedimentation would be reduced or avoided by construction best management practices and conservation measures. The short-term effects of habitat alteration would be offset by the long-term benefits of new, high quality, habitat features (pool/step complexes, large woody debris, removal of rock weirs, a culvert, bridges, native plant replacement, and enhancement of riparian zones). When the potential effects of the proposed Master Plan Update improvements on coho salmon EFH in the project area were considered relative to the proposed conservation and mitigation measures, the EFH assessment concluded that the proposed action "may adversely affect" coho EFH for a short-term period, but would have "no effect" long term, and would have an overall beneficial effect on coho EFH.

In its May 31, 2001 concurrence letter (page 16), NMFS states the following with regard to groundfish and pelagic EFH:

> "The action area includes habitats which have been designated as EFH for various life stages of 17 species of groundfish, said 4 coastal pelagic species (Table 2). Information submitted by FAA in the BA is sufficient for NMFS to conclude that the effects of the proposed actions are transient, local, and of low intensity and are not likely to adversely affect EFH in the long-term. NMFS also believes that the conservation measures proposed as an integral part of the actions would avert, minimize, or otherwise offset potential adverse impacts to designated EFH."

NMFS further recommended that the FAA consider conservation measures for EFH. NMFS found "The conservation measures that the FAA included as part of the STIA projects are along with those that NMFS recommends in the ESA Concurrence letter, adequate to minimize the adverse impacts from this project to designated EFH for the species in Table 3. It is NMFS' understanding that the FAA intends to implement the proposed activity with these built-in conservation measures that minimize potential adverse effect to the maximum extent practicable. Consequently, NMFS has no additional conservation recommendations to make at this time."

In its May 31, 2001 concurrence letter, NMFS stated that "EFH for Coho salmon (*O. kisutch*), a candidate species in Puget Sound, was not considered in this consultation although an independent assessment of EFH for coho was prepared by the Port and delivered to NMFS on March 27, 2001." Consequently, NMFS may recommend further conservation measures for coho salmon EFH. In the event final recommendations from NMFS concerning coho salmon EFH present significant new information not previously considered, FAA will supplement its NEPA record as appropriate.

E. MIGRATORY BIRD TREATY ACT

The Migratory Bird Treaty Act (MBTA) makes it illegal to pursue, hunt, take, capture, kill, attempt to take, capture or kill any migratory bird or "any part, nest, or egg of any such bird...by any means or in any manner," except as allowed by permit. Migratory birds that occur in King County include all birds except house sparrows, starlings, feral pigeons (rock doves), pheasant, quail, and domestic ducks, geese, and other exotic birds. **Table 2** lists the review of migratory bird species that may occur in the area.

The Final EIS and FSEIS addressed the effect of the proposed Master Plan Update projects on bird species in several places: Final EIS Chapter IV, Section 16 "Plants and Animals (Biotic Communities)"; Final EIS Chapter IV, Section 17 "Endangered Species", Final EIS Appendices K and M, and FSEIS Chapter 5-5 "Biotic Communities, Wetlands and Floodplains". Within these reports, the FAA considered the effect of the proposed project on bird species, including the issues governed by the MBTA.

As is noted in these report, within the project area, the Miller Creek and Des Moines creek corridors provide relatively low quality wildlife habitat, as they generally lack undisturbed native vegetation buffers and experience substantial human disturbance. The project will involve an overall improvement in the riparian habitat along these creeks, due to the enhancement of approximately 50 acres of riparian habitat in this area. The Master Plan Update projects will not alter or degrade any estuarine or nearshore habitat.

While the ESA defines the term "take" to include to harm and harass, including habitat modification. The term is not as broadly defined under the MBTA and thus includes only direct (albeit unintended) killing of protected birds.

In documenting the effect of the airport and the proposed project on birds in the EIS process, detailed consideration has been provided to the potential for bird strike incidents. Bird strikes and jet-engine bird ingestion have caused in the worst situations, aircraft to crash and resulted in loss of human life, or in lesser cases millions in dollars of aircraft damage. Such examples include a Boeing E-3 that crashed at Elmendorf Alaska in September 1995 after it ingested about 30 Canada geese on departure, resulting in the crash of the aircraft, killing all 24 on board.

At Sea-Tac Airport, approximately 20 bird strike incidents occur each year.[11] In response to Federal Aviation Regulation Part 139 and bird strike issues at the airport, the Port of Seattle developed a Wildlife Hazard Management Plan in August 2000. This plan replaced an earlier program that had been in place and approved by the FAA. The Port also has a Migratory Bird Depredation Permit issued by the FWS in June 2000, that enables the Port to "kill migratory birds for the purpose of assuring safe aircraft operations. The killing of birds must not be the principle control measure and is only to be employed in concert with an active scare and deterrent program." The Port is also authorized to "trap/release migratory birds which get caught in side SEA-TAC terminal buildings" and "raptors on or near runways to assure safe aircraft operations."[12] The

---

[11] Port of Seattle records, December 1996.

[12] Wildlife Hazard Management Plan, Seattle Tacoma International Airport, prepared by the Port of Seattle, August 2000.

permit excludes eagles and threatened or endangered species. Under the 2000 permit, the Port's wildlife coordinator is responsible for reporting controls to FWS (including species taken and hazed) each calendar year.

Noise disturbance associated with construction activities in the Miller and Des Moines creek evaluation areas is not expected to affect nesting eagles because the nearest active nest (No. 611) occurs over 2 mi away from the construction projects, beyond the quarter and half mile distances at which the bald eagle recovery plan regulates construction noise activities. The nearest inactive nest, associated with the Angle Lake territory, is 1 to 3 mi away from the various construction sites, also beyond the zone where noise activities are regulated.

Because major construction is planned outside the overwintering period for bald eagles (October 31 to March 31), increases in ambient noise levels at the site will not disturb overwintering eagles. Planting at the wetland mitigation site may occur during the overwintering period for bald eagles. During planting, noise levels at the wetland mitigation site will exceed ambient levels because trucks and other vehicles will deliver and distribute plant materials to the site. The change in noise levels that will occur at potential eagle perch trees (greater than 300 ft west of the planting activities) is unknown.

The Biological Assessment is in agreement with the 1996 Final EIS analysis in that construction activities are not expected to significantly impact nesting or wintering bald eagles or their prey because the eagles confine their activities to the vicinity of Puget Sound; thus, the loss of habitat associated with activities in this evaluation area would not affect eagle foraging or perching behavior.

The Auburn wetland mitigation site is too far from marbled murrelet nesting (in the Cascades) and foraging areas (in Puget Sound) for activities at this site to affect either nesting or foraging birds. Potential disturbance to traveling birds during wetland construction will be avoided given that murrelets travel between foraging and nesting sites during the early dawn hours when construction equipment would not be operating.

The Department of Ecology has been apprised of the Port of Seattle's plan to construct a wetland mitigation project near the Green River in Auburn to compensate for wetlands filled for construction of the third runway and related improvements at the Seattle-Tacoma International Airport. The primary function of the Auburn mitigation site will be to create wildlife habitat that cannot be replaced near the airport because of the potential hazard posed by an aircraft/wildlife collision. FAA guidelines (Advisory Circular 150/5200-33) state that wildlife-attracting mitigation projects should be located more than 10,000 feet from a runway serving jet aircraft. Migratory waterfowl, which frequent wetlands, are of particular concern because of their relatively large size and flocking characteristics. The City of Auburn has concluded that the Port's proposal is consistent with its Shoreline Master Program.

The *Final Environmental Impact Statement* identifies 56 bird species as occurring in the affected project area. The additional 14 species identified in the *Final Environmental Impact Statement* and that are excluded from **Table 2** in the comment are: green heron, American wigeon, Barrow's goldeneye, northern harrier, American coot, long-billed dowitcher, glaucous-winged

gull, olive-sided flycatcher, barn swallow, Swainson's thrush, orange-crowned warbler, yellow warbler, American goldfinch, and American crow.

Many of those species listed in **Table 2** rely on habitat that is very different from that affected by the Master Plan Update projects. Of the remaining species, habitat quality limits use of the project area, and approximately 20 percent of these remaining species are unlikely to regularly use the project area for nesting. These species likely use the project area only briefly during migration.

The Port has reviewed 17 bird species that could be impacted by the loss of upland habitat areas associated with Master Plan Update actions. These species include the following:

Band-tailed pigeon: Although the band-tailed pigeon is in decline, the main threat to the species appears to be habitat loss and direct human-caused mortality in Central America (Audubon 2001). In urban parks and gardens in western Washington, the species is actually becoming more common. Consequently, loss of habitat due to the proposed action is not expected to significantly affect the species.

Belted kingfisher: Belted kingfishers use wetland habitats with open water components. Wetlands that will be impacted by the Master Plan Update improvements do not provide suitable kingfisher habitat.

Pileated woodpecker: As stated in Appendix M of the *Final Environmental Impact Statement*, pileated woodpeckers have been observed in the approximately 187-acre deciduous forest in the central portion of the South Borrow Area. Under the proposed action, some of this forested area would be removed. Loss of this acreage will not have a significant effect on pileated woodpeckers regionally, as large tracts of their preferred habitat, mature coniferous forests, will be unaffected.

Barn swallow, tree swallow, cliff swallow, willow flycatcher, black-capped chickadee, bushtit, orange-crowned warbler, song sparrow, white-crowned sparrow, black-headed grosbeak, Wilson's warbler, American goldfinch: These species are all common in suburban environments. Abundant habitat outside of the project area will remain for these species following construction of Master Plan Update projects, because the birds are widely distributed in urban and non-urban areas throughout Puget Sound.

Swainson's thrush: This species occurs in coniferous and mixed forests with dense undergrowth. The majority of the acreage impacted by the proposed action does not contain adequate cover to provide habitat for the species. Habitat in the project area that will be impacted contains marginal nesting habitat for species, and these areas are most likely used for foraging habitat during migration. Remaining habitat in nearby areas outside of the project area will provide foraging habitat. Suitable Swainson's thrush nesting habitat in the low-elevation coniferous forests of western Washington will be unaffected.

Hutton's vireo: This species is a resident of mixed forests with evergreens and oaks, with moderate to dense canopy cover (Davis 1995). Most of the habitat impacted by the Master Plan Update projects does not contain adequate canopy cover to provide habitat for the species. Because only a small amount of marginal Hutton's vireo habitat will be impacted by the proposed action, the project will not have a significant affect on the species.

The Port's review also considered eight additional species:

Sharp-shinned hawk and Cooper's hawk: Loss of forest represents loss of habitat for these species. However, forest types impacted under the proposed action (i.e., young, deciduous

forest) are relatively common in the Puget Sound region and adequate habitat outside the project area will remain for these species.

Northern harrier, American kestrel and western meadowlark: Harriers, kestrels, and meadowlarks prefer open habitats. Approximately two-thirds of the existing unmanaged grassland habitat will remain upon completion of the proposed action. Although some existing managed grassland will be impacted, the total acreage of managed grasslands will increase overall (due to creation of new managed grassland areas).

Common nighthawk: This species nests in open areas and forages in a wide variety of habitats (Csuti et. Al. 1997). By increasing the amount of open habitat, the project will increase the amount of nighthawk nesting habitat. Some loss of foraging habitat will occur where areas are paved and similarly developed. However, given the wide variety of foraging habitat that this species will use, foraging habitat is not expected to be a limiting factor for this species, and other habitat in surrounding areas will remain as foraging areas.

Vaux's swift: This species uses a wide variety of habitats where suitable cavities (i.e., dead trees, chimneys) are available (Smith et al. 1997). Removal of trees and abandoned houses (with chimneys) will reduce available cavities for this species, although remaining trees within and near the project site will continue to provide cavities for the species.

Streaked horned lark: This species has been extirpated from most of the Puget Trough, and no breeding records for the species are present in the project vicinity (Smith et al. 1997). Use of the project area is likely limited to occasional fly-overs and stop-overs during migration.

In summary, many of the bird species listed in **Table 2** rely on habitat types that are very different from those affected by the Master Plan Update projects. The remaining species likely use the project area only briefly during migration. Further, 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 Master Plan Update project development. Since urban habitats similar to those being eliminated are common in Puget Sound and the Sea-Tac Airport vicinity, significant impacts on the regional populations of birds are unlikely. Consequently, the proposed action will not have a significant effect on regional populations of bird species considered in this analysis.

As is shown in this section, the proposed project would not have a significant adverse effect on migratory birds, and the documented project effects are consistent with the impacts discussed in the Final EIS and FSEIS.

David Field
Manager, Planning, Programming and Capacity Branch
Responsible Official for the Seattle-Tacoma International
Airport Master Plan Re-Evaluation

TABLE 1
Comparison of Wetlands In Study Area

Wetland	Classifications (percent of each type)	Size of Wetland/Water(Acres)		Project Impact (Direct and Indirect)	
		Refined	Original FSEIS	Refined	Original FSEIS
	Other Waters of U.S.	0.33	0.00[1]	0.14	0.00
1	Forested	0.07	0.07	0.00	0.07
2	Forested	0.73	0.74	0.00	0.74
3	Forested	0.56	0.56	0.00	0.19
4	Forested	5.00	5.02	0.00	0.46
5	Forested/Scrub-Shrub	4.63	4.58	0.14	1.69
6	Scrub-Shrub	0.86	0.87	0.00	0.00
7	Forested/Open Water/Emergent	6.68	6.70	0.00	0.00
8	Scrub-Shrub/Emergent	4.95	4.95	0.00	0.00
9	Forested/ Emergent (40/60)	2.83	2.85	0.03	0.13
10	Scrub-Shrub	0.31	0.31	0.00	0.00
11	Forested/Emergent (80/20)	0.50	0.50	0.50	0.47
12	Forested/Emergent (20/80)	0.21	0.21	0.21	0.21
13	Emergent	0.05	0.05	0.05	0.05
14	Forested	0.19	0.19	0.19	0.19
15	Emergent	0.28	0.28	0.28	0.28
16	Emergent	0.05	0.06	0.05	0.06
17	Emergent	0.02	0.03	0.02	0.03
18	Forested/Scrub-Shrub/Emergent (50/20/30)	3.56	0.12	2.84	0.12
19	Forested	0.56	0.57	0.56	0.57
20	Scrub-Shrub/Emergent (90/10)	0.57	0.06	0.57	0.06
21	Forested	0.22	0.22	0.22	0.22
22	Scrub-Shrub/Emergent (10/90)	0.06	0.06	0.06	0.06
23	Emergent	0.77	0.78	0.77	0.78
24	Emergent	0.14	0.14	0.14	0.14
25	Forested	0.06	0.06	0.06	0.06
26	Emergent	0.02	0.02	0.02	0.00
28	Scrub-Shrub/Emergent/Open Water (65/15/20)	35.45	18.10	0.07	0.06
29	Forested	0.74	0.74	0.00	0.74
30	Forested/Scrub-Shrub (80/20)	0.88	0.50	0.00	0.50
31	Emergent	0.05	0.05	0.00	0.00
32	Emergent	0.09	0.05	0.00	0.05
33	Forested/Shrub-Scrub/Emergent/Open Water	17.60	17.60	0.00	0.00
34	Open Water	1.40	1.40	0.00	0.00
35	Forested/Emergent (40/60)	0.67	0.21	0.67	0.18
36	Forested/Emergent	0.30	0.30	0.00	0.00
37	Forested/Emergent (70/30)	5.73[1]	2.41	4.11	1.68
38[2]	Emergent/Shrub Scrub	0.00	0.00	0.00	0.00
39	Forested	0.90	0.07	0.00	0.00
40	Scrub-Shrub	0.03	0.09	0.03	0.09
41a	Emergent/Open Water	0.35	NA	0.35	NA
41b	Emergent	0.09	0.09	0.09	0.08

Wetland	Classifications (percent of each type)	Size of Wetland/Water(Acres) Refined	Original FSEIS	Project Impact (Direct and Indirect) Refined	Original FSEIS
43	Forested/Scrub-Shrub/Emergent (estimated -50/30/20)	30.30	30.30	0.00	0.00
44a,b	Forested/Scrub-Shrub (70/30)	3.08	0.70	0.26	0.00
45	Emergent	5.00	5.00	0.00	0.00
46	Open Water	0.06	0.06	0.00	0.00
47	Open Water	0.20	0.20	0.00	0.00
48	Forested/Emergent (20/80)	1.58	0.02	0.00	0.00
49 [3]	Emergent	0.00	0.02	0.00	0.03
50 [3]	Shrub-Scrub	0.00	0.03	0.00	0.12
51	Forested	16.00	2.41	0.00	0.48
52	Forested/Scrub-Shrub/Emergent (80/20/20)	4.70	1.00	0.54	1.00
53	Forested	0.60	0.60	0.60	0.60
54	Shrub-Scrub/Open Water	25.70	25.70	0.00	0.00
55 [3]	Shrub-Scrub	0.00	0.04	0.00	0.04
A1	Forested/Scrub-Shrub/Emergent (15/15/70)	4.66	NA	0.59	NA
A2	Scrub-Shrub	0.05	NA	0.00	NA
A3	Scrub-Shrub	0.01	NA	0.00	NA
A4	Scrub-Shrub	0.03	NA	0.00	NA
A5	Emergent	0.03	NA	0.03	NA
A6	Forested	0.16	NA	0.16	NA
A7	Forested	0.30	NA	0.30	NA
A8	Forested/Scrub-Shrub (30/70)	0.38	NA	0.08	NA
A9	Scrub-Shrub	0.04	NA	0.00	NA
A10	Scrub-Shrub	0.01	NA	0.00	NA
A11	Scrub-Shrub	0.02	NA	0.00	NA
A12	Scrub-Shrub	0.11	NA	0.08	NA
A13	Forested	0.12	NA	0.00	NA
A14	Forested/ Scrub-Shrub/ Emergent (50/25/25)	0.19	NA	0.00	NA
A15	Emergent	0.04	NA	0.00	NA
A16	Scrub-Shrub/Emergent (20/80)	0.09	NA	0.00	NA
A17	Forest/Scrub-Shrub/Emergent (25/25/50)	2.66	NA	0.00	NA
A18	Scrub-Shrub	0.01	NA	0.01	NA
A19	Emergent	0.04	NA	0.00	NA
Lora Lake	Open Water	3.06	NA	0.00	NA
B1	Forested/Scrub-Shrub (30/70)	0.27	NA	0.00	NA
B10	Forested	0.02	NA	0.00	NA
B11	Emergent	0.18	NA	0.18	NA
B12 [4]	Scrub-Shrub	0.63	NA	0.07	NA
B14	Scrub-Shrub/Emergent (70/30)	0.78	NA	0.78	NA
B15a [4]	Shrub	0.21	NA	0.00	NA
B15b	Shrub	0.02	NA	0.00	NA
B4	Scrub-Shrub	0.07	NA	0.00	NA
B5	Forested/Scrub-Shrub (40/60)	0.08	NA	0.00	NA
B6	Forested/Scrub-Shrub (30/70)	0.55	NA	0.00	NA
B7	Forested/Scrub-Shrub (30/70)	0.03	NA	0.00	NA
B9	Forested	0.05	NA	0.00	NA

Wetland	Classifications (percent of each type)	Size of Wetland/Water(Acres) Refined	Original FSEIS	Project Impact (Direct and Indirect) Refined	Original FSEIS
E1	Forested	0.23	NA	0.00	NA
E2	Forested	0.04	NA	0.04	NA
E3	Forested	0.06	NA	0.06	NA
FW1	Farmed Wetland	0.03	NA	0.00	NA
FW2	Farmed Wetland	0.09	NA	0.00	NA
FW3	Farmed Wetland	0.59	NA	0.00	NA
FW5	Farmed Wetland	0.08	NA	0.08	NA
FW6	Farmed Wetland	0.07	NA	0.07	NA
FW8	Farmed Wetland	0.03	NA	0.00	NA
FW9	Farmed Wetland	0.01	NA	0.00	NA
FW10	Farmed Wetland	0.02	NA	0.00	NA
FW11	Farmed Wetland	0.11	NA	0.00	NA
G1	Emergent	0.05	NA	0.05	NA
G2	Emergent	0.02	NA	0.02	NA
G3	Emergent	0.06	NA	0.06	NA
G4	Emergent	0.04	NA	0.04	NA
G5	Emergent	0.87	NA	0.87	NA
G6	Emergent	0.01	NA	0.00	NA
G7	Forested/Scrub-Shrub (30/70)	0.50	NA	0.50	NA
G8	Emergent	0.04	NA	0.00	NA
R1	Emergent	0.17	NA	0.13	NA
R2	Scrub-Shrub/Emergent (70/30)	0.12	NA	0.00	NA
R3	Scrub-Shrub	0.02	NA	0.00	NA
R4	Emergent	0.11	NA	0.00	NA
R4b	Forest/Emergent (25/75)	0.11	NA	0.00	NA
R5	Emergent	0.05	NA	0.00	NA
R5b	Forest/Emergent (25/75)	0.07	NA	0.00	NA
R6	Forested/Emergent (25/75)	0.21	NA	0.00	NA
R6b	Emergent	0.09	NA	0.00	NA
R7	Forested	0.04	NA	0.00	NA
R7a	Emergent	0.04	NA	0.00	NA
R8	Scrub-Shrub/Emergent (40/60)	0.40	NA	0.00	NA
R9	Forested	0.38	NA	0.00	NA
R9a	Forest/Scrub-Shrub/Emergent (25/50/25)	0.74	NA	0.00	NA
R10	Forested	0.04	NA	0.00	NA
R11	Emergent	0.42	NA	0.00	NA
R12	Forested	0.03	NA	0.00	NA
R13	Emergent	0.12	NA	0.00	NA
R14a	Scrub-Shrub/Emergent (25/75)	0.13	NA	0.00	NA
R14b	Emergent	0.08	NA	0.00	NA
R15a	Forested/Scrub-Shrub/Emergent (25/65/10)	0.79	NA	0.00	NA
R15b	Forested/Emergent (25/75)	0.25	NA	0.00	NA
R17	Forested	0.31	NA	0.00	NA
IWS a, b	Forested	0.67	NA	0.00	NA
WH	Open water	0.25	NA	0.00	NA
DMC	Forest/Scrub-Shrub/Emergent	1.08	NA	0.00	NA

Wetland	Classifications (percent of each type)	Size of Wetland/Water(Acres) Refined	Original FSEIS	Project Impact (Direct and Indirect) Refined	Original FSEIS
W1	Emergent	0.10	NA	0.10	NA
W2	Forested/Emergent (20/80)	0.22	NA	0.22	NA
Auburn 1[5]	Emergent	20.42	NA	0.11	NA
Auburn 2	Emergent	0.60	NA	0.00	NA
Auburn 3	Emergent	0.01	NA	0.01	NA

[1] Impacts to non-wetland waters of the U. S. (i.e. relocation of Miller Creek) were described in the FEIS and FSEIS. Their acreage is quantified here.

[2] This area was determined not to be a regulated wetland by the City of SeaTac and the U.S. Army Corps of Engineers.

[3] Wetland areas 49, 50, and 55 were incorporated into Wetlands B-11, B-4, and 52, respectively.

[4] The portions of these wetlands located adjacent to the project site are estimated.

[5] This wetland extends off-site. The reported area includes wetlands in the construction access easement.

TABLE 2

Bird Species Reported near Sea-Tac Airport, wildlife surveys at Dumas Bay, and in the Kent Christmas Bird Count Area.

Common Name	Sea-Tac Master Plan EIS	Dumas Bay	Christmas Bird Count
Red-throated loon	No	Yes	Yes
Pacific loon	No	Yes	Yes
Common loon	No	Yes	Yes
Pied-billed grebe	Yes	Yes	Yes
Horned grebe	No	Yes	Yes
Red-necked grebe	No	Yes	Yes
Eared grebe	No	Yes	Yes
Western Grebe	No	Yes	Yes
Double-crested cormorant	No	Yes	Yes
Brandt's cormorant	No	Yes	Yes
Pelagic cormorant	No	Yes	Yes
American bittern	No	No	No
Great blue heron	Yes	Yes	Yes
Green heron	No	Yes	Yes
Trumpeter swan	No	No	Yes
Great white-fronted goose	No	No	Yes
Snow goose	No	Yes	Yes
Black brant	No	Yes	Yes
Canada goose	Yes	Yes	Yes
Wood duck	Yes	No	Yes
Green-winged teal	Yes	Yes	Yes
Mallard	Yes	Yes	Yes
Northern pintail	No	Yes	Yes
Cinnamon teal	No	Yes	Yes
Northern shoveler	No	Yes	Yes
Gadwall	Yes	Yes	Yes
Eurasian wigeon	No	Yes	Yes
American wigeon	Yes	Yes	Yes
Canvasback	No	Yes	Yes
Redhead	No	No	Yes
Ring-necked duck	No	No	Yes
Greater scaup	No	Yes	Yes
Lesser scaup	No	Yes	Yes
Harlequin duck	No	No	Yes
Black scoter	No	Yes	Yes
Surf scoter	No	Yes	Yes
White-winged scoter	No	Yes	Yes
Common goldeneye	No	Yes	Yes
Barrow's goldeneye	Yes	Yes	Yes
Bufflehead	No	Yes	Yes
Hooded merganser	No	Yes	Yes
Common merganser	Yes	Yes	Yes
Red-breasted merganser	No	Yes	Yes
Ruddy duck	No	Yes	Yes
Osprey	No	Yes	Yes

Common Name	Sea-Tac Master Plan EIS	Dumas Bay	Christmas Bird Count
Bald eagle	Yes	Yes	Yes
Northern harrier	Yes	No	Yes
Sharp-shinned hawk	Yes	Yes	Yes
Cooper's hawk	Yes	Yes	Yes
Northern goshawk	No	No	Yes
Red-tailed hawk	Yes	Yes	Yes
Rough-legged hawk	No	Yes	Yes
Swainson's hawk	No[13]	No	No
American kestrel	No	Historic	Yes
Merlin	No	Yes	Yes
Peregrine falcon	No	Yes	Yes
Ring-necked pheasant	No	Historic	Yes
Ruffed grouse	No	Historic	Yes
California quail	No	Yes	Yes
Virginia rail	No	Historic	Yes
Sora	No	Historic	Yes
American coot	No	Yes	Yes
Black-bellied plover	No	Yes	Yes
Semipalmated plover	No	Yes	No
Killdeer	Yes	Yes	Yes
Greater yellowlegs	No	Yes	Yes
Lesser yellowlegs	No	No (Expected)	No
Spotted sandpiper	No	Yes	Yes
Black turnstone	No	No (Expected)	Yes
Western sandpiper	No	Yes	Yes
Least Sandpiper	No	Yes	Yes
Dunlin	No	Yes	Yes
Snaderling	No	Yes	No
Long-billed dowitcher	No	No (Expected)	Yes
Short-billed dowitcher	No	Yes	No
Common snipe	No	Yes	Yes
Whimbrel	No	No	No
Parasitic Jaegar	No	Yes	No
Mew gull	No	Yes	Yes
Ring-billed gull	No	Yes	Yes
California gull	No	Yes	Yes
Herring gull	No	Yes	Yes
Thayer's gull	No	Yes	Yes
Western gull	No	Yes	Yes
Glaucous-winged gull	Yes	Yes	Yes
Glaucous x western gull	No	Yes	Yes
Gull sp	No	Yes	Yes
Heerman's gull	No	Yes	Yes
Caspian tern	No	Yes	No
Common tern	No	Yes	No
Common murre	No	Yes	Yes
Pigeon guillemot	No	Yes	Yes

[13] This species has been reported as salvaged on the STIA airfield.

Common Name	Sea-Tac Master Plan EIS	Dumas Bay	Christmas Bird Count
Marbled murrelet	No	Yes	Yes
Rhinoceros auklet	No	Yes	Yes
Band-tailed pigeon	Yes	Yes	Yes
Rock dove	Yes	Yes	Yes
Mourning dove	No	Historic	Yes
Common barn-owl	No	Yes	Yes
Western screech-owl	No	Yes	Yes
Great horned owl	Yes	Yes	Yes
Northern pygmy-owl	No	No	Yes
Snowy owl	No[1]	No	No
Short-eared owl	No	No	Yes
Northern saw-whet owl	No	Yes	Yes
Anna's hummingbird	No	Yes	Yes
Rufous hummingbird	No	Yes	No
Black swift	No[1]	No	No
Common nighthawk	No[1]	No	No
Belted kingfisher	Yes	Yes	Yes
Downy woodpecker	Yes	Yes	Yes
Hairy woodpecker	Yes	Yes	Yes
Northern flicker	Yes	Yes	Yes
Pileated woodpecker	Yes	Yes	Yes
Red-breasted sapsucker	No	Yes	Yes
Willow flycatcher	No	Yes	No
Pacific-slope flycatcher	No	Yes	No
Olive-sided flycatcher	Yes	Yes	No
Tree swallow	Yes	Yes	No
Violet-green swallow	No	Yes	No
Purple martin	No	Yes	No
Northern rough-winged swallow	No	Yes	No
Barn swallow	Yes	Yes	No
Cliff swallow	No	Yes	No
Bank swallow	No[1]	No	No
Horned lark	No[1]	No	No
Steller's jay	Yes	Yes	Yes
Common raven	No	Yes	Yes
Black-capped chickadee	Yes	Yes	Yes
Mountain chickadee	No	Yes	Yes
Chestnut-backed chickadee	No	Yes	Yes
Bushtit	Yes	Yes	Yes
Red-breasted nuthatch	Yes	Yes	Yes
White-breasted nuthatch	No	Historic	No
Brown creeper	Yes	Yes	Yes
Bewick's wren	Yes	Yes	Yes
Winter wren	Yes	Yes	Yes
Marsh wren	No	Yes	Yes
American dipper	No	Yes	Yes
Golden-crowned kinglet	No	Yes	Yes
Ruby-crowned kinglet	No	Yes	Yes
Hermit thrush	No	Yes	Yes

Common Name	Sea-Tac Master Plan EIS	Dumas Bay	Christmas Bird Count
American robin	Yes	Yes	Yes
Varied thrush	No	Yes	Yes
Swainson's thrush	No	Yes	No
Townsend's solitaire	No	Yes	No
American Pipit	No	Yes	Yes
Cedar waxwing	No	Yes	Yes
Northern shrike	No	Yes	Yes
European starling	Yes	Yes	Yes
Western warbling-vireo	No	Yes	No
Solitary vireo	No	Historic	No
Hutton's vireo	No	Yes	Yes
Orange-crowned warbler	Yes	Yes	Yes
Nashville warbler	No	Yes	No
Yellow warbler	Yes	Yes	No
Black-throated gray warbler	No	Yes	No
Common yellowthroat	No	Yes	Yes
Townsend's warbler	No	Yes	Yes
Audubon's warbler	No	Yes	Yes
MacGillivray's warbler	No	Yes	No
Wilson's warbler	No	Yes	No
Black-headed grosbeak	No	Yes	No
Western tanager	No	Yes	No
Rufous-sided towhee	Yes	Yes	Yes
Rustic bunting	No	No	Yes
Vesper sparrow	No	No	Yes
American tree sparrow	No	No	Yes
Savannah sparrow	No	Historic	Yes
Fox sparrow	No	Yes	Yes
Song sparrow	Yes	Yes	Yes
Lincoln's sparrow	No	No (Expected)	Yes
Swamp sparrow	No	No	Yes
White-throated sparrow	No	No	Yes
Golden-crowned sparrow	No	Yes	Yes
White-crowned sparrow	Yes	Yes	Yes
Harris' sparrow	No	No	Yes
Dark eyed junco	Yes	Yes	Yes
Red-winged blackbird	No	Yes	Yes
Western meadowlark	No	No	Yes
Brewer's blackbird	No	No	Yes
Brown-headed cowbird	No	Yes	Yes
Purple finch	No	Yes	Yes
House finch	No	Yes	Yes
Red crossbill	No	Yes	Yes
Pine siskin	No	Yes	Yes
American goldfinch	Yes	Yes	Yes
Evening grosbeak	No	Yes	Yes
House sparrow	Yes	Yes	Yes

Kent Christmas Bird Count Area. (modified from letter to US Army Corps of Engineers by Donald Norman, February 16, 2001)

ATTACHMENT A

BIOLOGICAL OPINION/CONCURRENCES FROM THE SERVICES

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Western Washington Office
510 Desmond Drive SE, Suite 102
Lacev Washington 98503
Phone: (360) 753-9440 Fax: (360) 753-9008

MAY 2 2 2001

Lowell H. Johnson
Federal Aviation Administration
1601 Lind Avenue SW
Renton, Washington 98055-4056

FWS Reference #: 1-3-00-F-1420, Master Plan Update Improvements, Seattle-Tacoma International Airport

X Reference #: 1-3-96-I-29, 1-3-99-SP-0744

Dear Mr. Johnson:

This document transmits the U. S. Fish and Wildlife Service's (FWS) biological opinion (BO) regarding the effects of the proposed Master Plan Update Improvements (MPUI) for the Seattle-Tacoma International Airport (Sea-Tac) in King County, Washington on the threatened bull trout (*Salvelinus confluentus*), bald eagle (*Haliaeetus leucocephalus*), and marbled murrelet (*Brachyramphus marmoratus*) in accordance with Section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). This project is proposed by the Port of Seattle, Sea-Tac (Port). Your June 15, 2000, request for formal consultation was received by our office on approximately June 16, 2000. We received a letter by fax from you on August 21, 2000, requesting that we concur with a "may affect, not likely to adversely affect" call for the marbled murrelet rather than a "no effect."

This biological opinion is based on the following information: biological assessment (BA) dated June 2000; Supplement for Property Acquisition and Demolition for 34X Runway Protection Zone, dated September 2000; supplement to the BA, dated December 18, 2000; Memorandum, dated December 21, 2000; Sea-Tac Runway Fill Hydrology Studies Report (PGG 2000), Comprehensive Stormwater Management Plan (Parametrix 2000a); Seattle-Tacoma Airport Master Plan Update, Low Streamflow Analysis (Earth Tech, Inc. 2000) letter dated October 30, 2000 transmitting new Joint Aquatic Resources Permit Application; Final Natural Resource Mitigation Plan (Parametrix 2000b) information provided by fax from you on October 16, 2000 and January 10, 2001; e-mail and telephone communications from the Port on April 20, 21, and 23, 2001; e-mails, letters and attachments dated March 26 and 30, and April 20 and 24, 2001 from James Lynch, Stoel Rives, LLP, the law firm representing the Port; information provided by telephone, fax and e-mail by your consultant, Parametrix Inc., on August 18, 21, 22, and 23, 2000, December 28 and 29, 2000, and January 17, 18, and 19, 2001; documents from the Airport

Communities Coalition; and other supplemental information provided in numerous telephone calls, and email or written correspondence up through May 22, 2001. A complete administrative record of this consultation is on file at this office.

CONSULTATION HISTORY

The FAA originally consulted with the Service on this action in 1995. The BA for that consultation addressed effects to bald eagles and peregrine falcons, and concluded that the proposed MPUI "may affect, but will not adversely affect" these species (Tims 1995, FAA 1995). The FWS concurred with these determinations (USFWS 1995).

Due to the recent listing of bull trout, new information regarding the presence of marbled murrelets in the action area, and modifications to the project proposal not previously analyzed, the FAA has requested reinitiation of this consultation. Since that time, the peregrine falcon has been delisted (August 25, 1999, 64 FR 46542), and therefore, is not addressed in this reinitiation of consultation.

The FAA determined that the current proposed action is "not likely to adversely affect" the bull trout, the bald eagle and the marbled murrelet. Although ESA Section 7 compliance for the proposed project could be completed through informal procedures, the FAA requested that the FWS use the formal consultation process. Therefore, this BO will address the effects to bull trout, bald eagle, and marbled murrelet.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

Project Location

The proposed MPUI is located at Sea-Tac within the cities of SeaTac and Des Moines, King County, Washington (Sections 4 and 5, Township 22 North, Range 4 East, and Sections 20, 21, 28, 29, 32, and 33, Township 23 North, Range 4 East, Willamette Meridian). Associated with these improvements is the off-site wetland mitigation located in the City of Auburn, King County, Washington (Section 31, Township 22 North, Range 5 East, Willamette Meridian).

Project Description

The MPUI would develop portions of property located on and near the existing Sea-Tac airport, and provide wetland mitigation near the Green River in the City of Auburn. The proposed actions will impact creek, riparian and wetland habitats within the action area. The FAA's proposed actions are:1) to approve future collection and use authorization for passenger facility charges related to implementation of Sea-Tac Master Plan update MPUI; 2) issue future grants and grants issued after May 24, 1999, related to the implementation of MPUI; and 3) direct

construction of the airport traffic control tower and navigational aids. The U. S. Army Corps of Engineers (Corps) proposed action is the issuance of a Clean Water Act 404 permit for the proposed fill within waters of the United States, including wetlands, and associated mitigation. The proposed project will result in the permanent filling on-site of approximately 18.37 acres of wetlands and temporarily filling of 2.05 acres of wetlands. Also, approximately 21.64 acres of historically farmed and emergent wetlands will be temporarily filled and 0.12 acres of wetlands will be permanently filled as part of the off-site mitigation in Auburn. Mitigation for proposed aquatic impacts includes but is not limited to the following: restoration or enhancement of 25.21 acres of wetlands in basin and 49.48 acres of wetlands out-of-basin at the Auburn mitigation site. The following (Table 1) is a listing of all proposed actions included in the MPUI.

Table 1. Proposed Master Plan Update improvement projects at Sea-Tac Airport.

Project	Description
Runway and Taxiway Projects	
Property Acquisition, Street and Utility Vacation	Includes purchasing property and demolishing existing structures between existing Sea-Tac boundary west to Des Moines Memorial Drive and State Route (SR) 509. Required for third runway embankment fill and construction impact mitigation. Acquisition and demolition are also required for the south runway protection zone (RPZ).
Embankment Fill	Embankment for third runway, constructed using imported fill. Approximately 16.5 million cubic yards (cy) will be placed over a 5- to 7-year period. Existing roads and streets under the embankment footprint will be removed.
Interconnecting Taxiways	New connecting taxiways between existing runway and third runway. Project is located on existing airfield, requiring only minimal grading.
Runway 16X/34X	Paving of third runway after completion of embankment fill.
Extension of Runway 34R by 600 feet (ft)	Extend runway by 600 ft for improved warm weather and large aircraft operations. Project is located at the southern end of the east runway.
Additional Taxiway Exits on 16L/34R	Construction of new ramps to the existing terminal apron.
Dual Taxiway 34R	Improvements to taxiways serving the South Aviation Support Area (SASA) and south apron.

Project (cont.)	Description (cont.)
Runway Safety Areas (RSAs)	
Runway 34R Safety Fill	Extend runway safety fill to meet FAA standards.
RSAs 16R/16L	Extend safety fills by 1,000 ft to meet FAA standards.
Relocation of Displaced Threshold on Runway 16L	Airfield taxiway improvements. The runway threshold (i.e., the emergency landing pad at end of runway pavement) to be relocated onto new RSA.
Miller Creek Sewer Relocation	Relocate sewer for third runway embankment and runway safety fills. New sewer to run along alignment of new 154th/156th Street.
Borrow Sites	
Borrow Sites	Sources of fill for third runway embankment, located on Sea-Tac property south of the airport. Approximately 6.7 million cy[1] of material to be excavated from three sites and transported across airport property to the embankment.
FAA Navigation Aids (NAVAIDS)	
New Airport Traffic Control Tower	New air traffic control tower to be located in existing developed area near terminal.
Relocate Airport Surveillance Radar, Airport Surface Detection Equipment, NAVAIDS	Existing radar and navigation equipment will be relocated to allow construction of third runway.
Airfield Building Improvements	
New Snow Equipment Storage	New building to house snow removal equipment.
Weyerhaeuser Hangar Relocation	Relocate existing hangar on west side of airfield to allow construction of third runway. New hangar will be located near south end of third runway.
Terminal/Air Cargo Area Improvements	
Relocation of Airborne Cargo	Relocate existing cargo building from air traffic control tower site to north cargo area. Located in existing developed area near terminal.
Central Terminal Expansion	Passenger terminal remodel. Located in existing developed area at terminal.
South Terminal Expansion Project (STEP)	Passenger terminal remodel. Located in existing developed area to the south of the main passenger terminal.
Northwest Hangar Relocation	Relocate Northwest hangar to site now occupied by Delta hangar. Located in existing developed area.

Project (cont.)	Description (cont.)
Satellite Transit Shuttle System Rehabilitation	Remodel and upgrade underground transit system linking terminal to satellites.
Redevelopment of North Air Cargo	New or expanded air cargo facilities along Air Cargo Road at north end of airport.
Expansion of North Unit Terminal (North Pier)	Addition to new passenger terminal located north of existing terminal. Located in existing developed area (Doug Fox parking lot and airport access freeway).
New Airport Rescue and Fire Fighting Facility	Replaces facility displaced by new North Terminal. The new facility will be located to the north of the North Terminal.
Cargo Warehouse at 24th Avenue South	New air cargo facility located north of SR 518 on 24th Avenue South.
Westin Hotel	New hotel located immediately north of main passenger terminal. Located in existing developed area at terminal.
New Water Tower	Construct new water tower and piping in engineering yard south of South 160th Street in subbasins (Gilliam Creek watershed) served by stormwater outfalls 012 and 013.
Roads[2]	
Temporary SR 518 and SR 509 Interchanges	Temporary access ramps to serve construction of third runway embankment and runway safety fill; to be removed after project completion.
154th/156th Street Relocation	Relocate public roadway to allow construction of third runway embankment and runway safety fills. Existing road to be demolished.
154th/156th Street Bridge Replacement	Relocate existing South 156th Street bridge over Miller Creek to accommodate the third runway footprint and South 154th/156th Street relocation. In-water work associated with this project is limited to the removal of the existing bridge and bank restoration.
Improvements to Main Terminal Roads	Transportation circulation, seismic and other improvements to roadway systems serving terminal.
Improved Access and Circulation Roadway Improvements	Improvements to existing roadway system serving passenger terminal, garage, and air cargo facilities.
North Unit Terminal Roadways	Improvements to existing roadway system to serve the new North Terminal and garage.
Improvements to South Access Connector Roadway (South Link)	Improvements to existing roadway system serving passenger terminal, garage, and air cargo facilities. Will connect terminal and garage area to South Access roadway and SR 509 extension south of the airport.

Project (cont.)	Description (cont.)
Parking	
Main Parking Garage Expansion	Expand parking facility at main passenger terminal on north and south sides (existing developed areas), and add floors to portions of the existing garage.
The North Employees Parking Lot (NEPL), Phase 1	New parking facility for employees, located north of SR 518.
North Unit Parking Structure	Construction of new garage serving new North Terminal facility. Facility will be located at existing Doug Fox parking lot.
The South Aviation Support Area	
The SASA and Access Taxiways	New airport support facility for cargo and/or maintenance, located at the south end of the airport south of the Olympic Tank Farm and South 188th Street. Airplane access will be by new parallel taxiway constructed along Runway 34R.
Relocation of Existing Facilities to the SASA	Airport operation support facilities will be relocated to the SASA once SASA site development is completed. Many of these facilities must be relocated from their present locations due to main terminal expansion (i.e., STEP and North Terminal), including Northwest hangar, ground support equipment, ground and corporate aviation facilities, new airport maintenance building, and United maintenance complex.
Stormwater Facilities[3]	
Miller Creek Detention Facility Expansion	Expand the Miller Creek Detention Facility by 16.4 acre-ft to provide flow control retrofitting for existing Sea-Tac discharges to Miller Creek. All construction would take place in uplands, and would create free-draining detention volume.
SASA Detention Pond	Create regional stormwater detention pond for the SASA project and other sites. The pond is 33.4 acre-ft and discharges to Des Moines Creek.
NEPL Vault	A 13.9 acre-ft vault to retrofit the NEPL; discharges to Miller Creek via Lake Reba.
Third Runway Vaults and Ponds	Stormwater detention vaults and ponds at the north, west, and south sides of the airport, discharging to Miller, Walker, and Des Moines Creeks.
Sea-Tac Retrofit Facilities	Detention vaults or ponds to provide flow control retrofitting for existing Sea-Tac discharges to Des Moines Creek. Vaults to be constructed in combination with third runway facilities when possible.

Project (cont.)	Description (cont.)
Cargo Vault	Detention vault for North Cargo Facility (4.5 acre-ft discharging to Miller Creek via Lake Reba).
Natural Resources	
Miller Creek Relocation	Approximately 980 ft of Miller Creek immediately downstream of the Miller Creek Detention Facility will be relocated to accommodate third runway embankment and runway safety fill.
Miller Creek Buffer and Wetland Enhancement	Establish a 100-ft buffer (average) along approximately 6,500 linear ft of Miller Creek and riparian wetlands associated with Miller Creek within the acquisition area. Enhance approximately 7.4 acres of existing wetlands along the stream.
Miller Creek Floodplain and Wetland Restoration	Excavate approximately 9,600 cy from the Vacca Farm site adjacent to Miller Creek to compensate for approximately 8,500 cy of floodplain fill for third runway embankment and north safety fill. Restore and enhance approximately 17 acres of stream habitat, floodplain wetlands, aquatic habitat in Lora Lake, and buffers at Vacca Farm.
Miller Creek Instream Habitat Enhancement	Project 1: South of the Vacca Farm site, approximately 650 ft of channel. Remove rock riprap, footbridges, and trash. Place large woody debris (LWD) throughout this section of the stream. Plant riparian areas along the stream with native wetland and upland plant species. Project 2: Approximately 150 ft upstream of South 160th Street, approximately 235 ft[1] of channel. Install LWD in the stream channel, grade a small section of the west bank of the stream to create a gravel bench in the floodplain, remove two rock weirs to improve fish passage, and plant the upland area with native trees and shrubs. Project 3: Immediately downstream of South 160th Street, approximately 380 ft[1] of channel. Grade a section of the east bank, remove a rubber-tire bulkhead and install LWD in the stream and on its banks. Plant buffer areas with native trees and shrubs. Project 4: Miller Creek immediately upstream of 8th Avenue South, approximately 820 ft[4] of channel. Grade portions of both banks. Remove footbridges and portions of concrete block walls. Install LWD in the stream and on its banks. Plant buffer areas with native trees and shrubs.

Project (cont.)	Description (cont.)
Miller Creek Instream Habitat Enhancement (cont.)	In addition to these specific enhancements, debris such as tires, garbage, and fences will be removed throughout the entire stretch of Miller Creek from the Vacca Farm site south to Des Moines Memorial Drive. In areas where access is readily available, LWD will be selectively placed throughout the stream to improve instream habitat conditions.
Drainage Channels Relocation	Relocate a minimum of 1,290 linear ft of drainage channels to accommodate the third runway embankment. Plant buffers along the drainage channels with native grass and shrubs.
Restoration of Temporarily Impacted Wetlands	Approximately 2.05 acres of wetland located west of the third runway embankment, north of relocated South 154th Street, and west of the Miller Creek relocation project, will be temporarily filled or disturbed during embankment construction. When construction activities are completed, remove fill material, restore pre-disturbance topography, and plant wetlands with native shrub vegetation.
Tyee Valley Golf Course Wetlands Enhancement and Des Moines Creek Buffer Enhancement	Restore approximately 4.5 acres of emergent wetland area and approximately 1.6 acres of buffer located within Tyee Valley Golf Course to a native shrub vegetation community. The enhancement actions would be integrated into plans to construct a Regional Detention Facility on the golf course[2] (King County Capital Improvement Project Design Team 1999). The enhancement would convert the existing turf wetland to native shrub wetland community. Enhance approximately 3.4 acres (average 100 ft wide) of buffer and 1.0 acre of existing wetland along Des Moines Creek.
Wetland Habitat (including Avian Habitat) near the Green River in Auburn	Restore wetland functions to a 67-acre parcel near the Green River in the City of Auburn. Create and/or restore approximately 17.2 acres of forest, 6.0 acres of shrub, 6.2 acres of emergent, and 0.60 acre of open-water wetland. Enhance approximately 19.5 acres of existing wetlands. Enhance protective buffers totaling about 15.90 acres.

[1] Size modified from that originally stated in BA.

[2] Temporary roads used to haul fill material from three on-site borrow areas to construction sites are included in the analysis of the borrow areas and are not listed here.

[3] Des Moines Creek Basin Plan Committee may construct a Regional Detention

Facility on Tyee Golf Course to provide regional flow control. This project would eliminate the need for Sea-Tac retrofit facilities described above. As this is project would be subject to a future federal action, it is not considered a Master Plan Update improvement and is not addressed in this BO.

[4] Project length includes approximately 12 ft of instream work as part of driveway demolition, and 400 ft of riparian enhancement.

The proposed project would result in a relatively small increase in the total number of operations (airplane take-offs or landings) over existing conditions. Operations without the new facilities are approximately 460,000 annually. With the proposed project, by 2010, the operations would reach 474,000 (M. Vigelanti, Synergy Consultants, pers. com., 2001). This is an increase of approximately 14,000 take-offs or landings or approximately 3 percent.

STATUS OF THE SPECIES (rangewide and/or recovery unit)

Bull Trout

On November 1, 1999, the FWS (USDI 1999a) listed all distinct population segments (DPSs) of the bull trout, a member of the family Salmonidae, within the coterminous United States as threatened. Five DPSs with 187 subpopulations are currently identified. They include 1) Coastal/Puget Sound, 34 subpopulations; 2) Columbia River, 141 subpopulations; 3) Jarbidge River, 1 subpopulation; 4) St. Mary-Belly River, 4 subpopulations and; 5) Klamath River, 7 subpopulations. Critical habitat has not been designated at this time. The bull trout is mainly threatened by habitat degradation, passage restrictions at dams, and competition from non-native lake trout (*Salvelinus namaycush*) and brook trout (*Salvelinus fontinalis*).

The FWS has identified 35 subpopulations of native char (bull trout and/or Dolly Varden) within the Coastal/Puget Sound DPS. These subpopulations are grouped into five analysis areas based on their geographic location: Coastal, Strait of Juan de Fuca, Hood Canal, Puget Sound, and Transboundary. These groupings were made in order to identify trends that may be specific to certain geographic areas.

The FWS has rated the subpopulations as either strong, depressed, or unknown, modified after Rieman et al. (1997). A strong subpopulation is defined as having all life history forms that once occurred, abundance that is stable or increasing, and at least 5,000 total fish or 500 adult fish present. A depressed subpopulation is defined as having either a major life history form eliminated, abundance that is declining or half of the historic abundance, or less than 5,000 total fish or 500 adults present. A subpopulation status is unknown if there is insufficient information to determine whether the status is either strong or depressed. Within the Coastal/Puget Sound DPS, only one subpopulation is considered strong, 10 are depressed, and 25 are unknown.

The proposed project is located within the Puget Sound Analysis Area of the Coastal/Puget Sound DPS. Fifteen subpopulations occur in the Puget Sound Analysis Area, from the Nisqually River north to the Upper Middle Fork Nooksack River. The more northern subpopulations appear to be relatively more abundant compared to the southern populations (USDI 1999). The large amount of federal land in these northern drainages, and the lower levels of urbanization, provide better habitat conditions than in southern Puget Sound. All five of the subpopulations within the Seattle-Olympia urban corridor are considered depressed. These subpopulations are within the Nisqually River, Puyallup River, Green River, and Lake Washington basins. Although there is scant historical information on population abundance, adverse impacts associated with habitat degradation have been documented for other salmonid species in these systems (e.g., chinook salmon (*Oncorhynchus tshwytscha)*). Given the bull trout's more restrictive habitat requirements, it is reasonable to assume that native char have been similarly affected. These adverse impacts include fish passage barriers, water temperature, interactions with nonnative salmonids, geomorphic processes, timber harvest, agricultural practices, and urban development.

Taxonomists have considered the bull trout to be a separate char species from Dolly Varden (*Salvelinus malma*) since 1978 (Cavender 1978). The American Fisheries Society formally accepted the two separate species in 1980. Bull trout populations exhibit four distinct life history forms: resident, fluvial, adfluvial, and anadromous.

Resident bull trout inhabit the same streams or nearby tributaries in which they were hatched. Fluvial bull trout spawn in tributary streams where the young rear from one to four years before migrating to a river where they grow to maturity. Adfluvial bull trout spawn in tributary streams, and, after rearing, migrate to a lake (Fraley and Shepard 1989). Anadromous char are known only to occur in Coastal/Puget Sound DPS subpopulations where major growth and maturation occurs after migration to and from salt water. Potentially anadromous bull trout populations have been identified in the Puyallup, White, Carbon, and Green Rivers. These diverse life histories are important to the stability and viability of bull trout populations (Rieman and McIntyre 1993).

Bull trout have more specific habitat requirements than other salmonids. High quality bull trout habitat is typically characterized by cold temperatures; abundant cover in the form of large wood, undercut banks, boulders, etc.; clean substrate for spawning; interstitial spaces large enough to conceal juvenile bull trout; and stable channels. Because habitat has been degraded in many basins and bull trout populations in these basins may be depressed, the fish may utilize less optimal habitat.

Stream temperatures and substrate types are critical for their sustained long-term residence. Bull trout are found primarily in colder streams, although the fish are also found in larger, warmer river systems that may cool seasonally or provide migratory corridors and important forage bases. Bull trout are associated with the coldest, cleanest and most complex stream reaches within basins. Temperature is critical for spawning and early life history requirements. Very cold water is required for incubation, and juvenile rearing appears to be restricted to areas with cold water.

Spawning areas are often associated with the coldest streams in a river basin. In one study by Goetz (1994), juvenile bull trout were not found in water temperatures above 12 ° Celsius (C). Many studies show that temperatures must drop below 9 ° C or 10 ° C before spawning occurs (McPhail and Murray 1979; Craig 1997). Egg survival decreases as water temperature increases, with higher survival levels documented at 2 ° C to 4 ° C (McPhail and Murray 1979). The best bull trout habitat in several Oregon and Washington streams had temperatures which seldom exceeded 15 ° C (Buckman et al. 1992; Craig 1997; Ratliff and Howell 1992; Ziller 1992). Stream bottom and substrate composition are also highly important for bull trout (Pratt 1992), especially for juvenile rearing and spawning site selection (Rieman and McIntyre 1993; Graham et al. 1981; McPhail and Murray 1979). Fine sediments can influence incubation survival and emergence success (Weaver and White 1985) but might also limit access to substrate interstices that are important cover during rearing and over-wintering (Goetz 1994; Jakober 1995; USDI 1999a).

The anadromous life-form is more complex than the other life-forms discussed. Limited information on the marine and estuarine residency for bull trout is known. While it was thought that the Dolly Varden were primarily anadromous and the bull trout were fluvial and adfluvial in the north Puget Sound area, this is not the case. In the limited sampling done in Port Susan and Skagit Bay, the char have been identified as both bull trout and Dolly Varden (Kraemer in prep.).

In the north Puget Sound area many of the sub-adult char migrating out of headwater or mainstem areas adopt an anadromous life history. The smolts move downstream in the spring of the year (April, May, and early June) to the river mouths and nearby beaches. Sub-adults typically spend the spring and most of the summer in the marine environment where they experience rapid growth (25 millimeters (mm) to 40 mm per month).

Bull trout are opportunistic feeders. Like other apex predators, they require a large prey base and a large home range. Sub-adult and adult migratory bull trout move throughout and between basins in search of prey. Resident and juvenile bull trout prey on terrestrial and aquatic insects, macrozooplankton, amphipods, mysids, crayfish, and small fish (Wyman 1975; Rieman and Lukens 1979 in Rieman and McIntyre 1993; Goetz 1989; Donald and Alger 1993). Adult and sub-adult migratory bull trout are primarily piscivorous, feeding on various trout and salmon species, whitefish, yellow perch, and sculpin. A recent study in the Cedar River Watershed of western Washington found adult bull trout diets to also consist of salamanders (Connor et al. 1997).

Limited stomach content work and feeding observations indicate that while the char are in the marine environment of Skagit Bay and Port Susan they feed heavily on surf smelt (*Hypomesus pretious*). Other food items eaten in the marine waters include Pacific herring (*Clupea harengus pallasi*), Pacific sand lance (*Ammodytes hexapterus*), pink salmon smolts (*Oncorhynchus gorbuscha*), chum salmon smolts (*O. keta*), and a number of invertebrates. In Port Susan and Skagit Bay the smelt and herring spawning beaches match nearly exactly those used by the char while they are in the marine area (Kraemer in prep.). This matches information for foraging in

freshwater, where bull trout were found to aggregate near seasonally concentrated forage fish in Flathead Lake, Montana (MBTSG 1998).

After several months in salt water, maturing adult bull trout begin their spawning migration. The fish leave the tidal areas in late May, June and early July. At this time, the first time spawners are 400 mm to 525 mm in length. In the Sauk basin the spawning migration can be as long as 195 km and the fish may climb to an elevation of 1000 meters (Kraemer in prep.). Bull trout become sexually mature between 4 and 9 years of age (Shepard et al. 1984), and may spawn in consecutive or alternate years (Shepard et al. 1984; Pratt 1992). Migratory bull trout frequently begin their spawning migrations as early as May, moving from the salt water back to the lower river and its tributaries to begin their spawning migration. The anadromous life-form does make considerable migrations. Migratory bull trout have been known to move upstream as far as 259 kilometers (155 miles) to spawning grounds (Fraley and Shepard 1989). Fish may be in salt water areas 40 km from the river mouth in the spring of the year and have been documented moving nearly 200 km upstream of the river mouth during spawning migrations. An adult tagged while staging in the spawning areas of the upper South Fork Sauk was recaptured by a fisherman the following spring in the marine area on the east side of Camano Island, fifteen air miles from the mouth of the Skagit River. A radio tagging study on the South Fork Skykomish (Kraemer pers. com. *in* WDFW 1997) showed that when the fish did migrate in the upper watershed, they commonly moved 2 km to 3 km a day with the maximum distance traveled of 15.2 km. In the lower river, the fish may travel at an even greater rate. During the low flows of summer and fall, most of the movement seemed to occur during the low-light periods just after dawn or before sunset. Once the fish reach staging areas near the spawning ground they may remain in the same general area, even the same pool, for several months.

In the Coastal/Puget Sound region, spawning occurs from August through December. Spawning typically occurs in cold, low-gradient 1st- to 5th-order tributary streams, over loosely compacted gravel and cobble having groundwater inflow (Shepard et al. 1984; Brown 1992; Rieman and McIntyre 1996; Swanberg 1997; MBTSG 1998). Spawning sites usually occur near cover (Brown 1992). They typically spawn in headwaters of tributary streams (Craig 1997). Hatching occurs in winter or early spring, and alevins may stay in the gravel for extended periods, sometimes exceeding 220 days. After spending the winter in the lower 35 kilometers (km) to 40 km of the river, the sub-adult char return to the marine environment. Some fish reenter the salt water as early as late February. Post-spawning mortality, longevity, and repeat-spawning frequency are not well known (Rieman and McIntyre 1996), but lifespans may exceed 10-13 years (McPhail and Murray 1979; Pratt 1992; Rieman and McIntyre 1993; USDI 1999a).

The full range of depths bull trout may use in Puget Sound is not known. There is some limited information on preferred depths available from freshwater lakes. This may be an appropriate surrogate for marine waters. One bull trout has been captured at 60 meters in Lake Washington, Washington (D. Beauchamp, University of Washington, pers. com. 2000). Bull trout were captured infrequently in Flathead Lake, Montana at depths greater than 34 meters (MBTSG

1998). However, there appeared to be tendency for bull trout to be associated with depths less than 34 meters (Leathe and Graham 1982 *in* MBTSG 1998, Huston 1975 *in* MBTSG 1998).

Bull trout are threatened by land management activities, water management activities, over-harvest, and competition or hybridization with non-native fishes (USDI 1999a). Urban and agricultural development has resulted in the loss of riparian habitat and wetlands, with a subsequent increase in impervious surfaces. These changes, especially in the lowland streams, have resulted in increased stream temperatures, alteration of stream flows and water quality, and impacts to forage species. Logging, road building activities and associated cumulative effects impact bull trout through increased sediment production and delivery to streams, loss of large pools and woody debris, increased water temperatures, and degradation of water quality and quantity. Dam, reservoir and irrigation construction and operations have altered portions of bull trout habitat. Dams without fish passage create barriers to migratory bull trout metapopulations. Dams and reservoirs also alter the natural hydrograph, thereby affecting forage, water temperature, and water quality.

Bald Eagle

A detailed account of the taxonomy, ecology, and reproductive characteristics of the bald eagle is presented in the Pacific States Bald Eagle Recovery Plan (USFWS 1986) and the final rule to reclassify the bald eagle from endangered to threatened in all of the lower 48 States (60 FR 36010). Additional information on the listing of the species, and its status in Washington State was included in the biological opinion for the Point Roberts golf course (USFWS 1999a).

The bald eagle is found throughout North America. It breeds primarily in Alaska, Canada, the Pacific Northwest states, the Rocky Mountain states, the Great Lake states, and Chesapeake Bay (USFWS 1986, American Ornithologists' Union 1983). The bald eagle winters over most of the breeding range, but is most concentrated from southern Alaska and southern Canada southward.

The recent proposal to delist the bald eagle in the lower 48 states (USDI 1999b) indicates that numeric delisting goals have been met for the bald eagle in the Pacific Recovery Region since 1995. The proposed project is located within the Pacific Recovery Region.

In Washington, bald eagles are most common along saltwater, lakes, and rivers in the western portion of the state and along the Columbia River east of the Cascade Mountains (Larrison and Sonnenberg 1968). Resident, breeding eagles are found throughout the state near large bodies of water. Most nesting habitat in Washington is located in the San Juan Islands and on the Olympic Peninsula coastline (Grubb 1976).

The primary wintering range of bald eagles in Washington is Puget Sound and its major rivers. Most eagles wintering in Washington occur along the Skagit, Nooksack, and Sauk River Basin (USFWS 1986).

The bald eagle is found along the shores of saltwater, and freshwater lakes and rivers. In Washington, breeding territories are located in predominantly coniferous, uneven-aged stands with old-growth components (Anthony et al. 1982).

Bald eagles typically build large stick nests in mature or old-growth trees, and these nests are generally used over successive years. In Washington, courtship and nest building activities normally begin in March or early April, with eaglets hatching in mid-April or early May. Eaglets usually fledge in mid-July (Anderson et al. 1986).

The size of an eagle nest is dictated by the forest type and tree species found within a geographic area; eagles apparently select nest sites for structure rather than tree species (Anthony et al. 1982, Anthony and Isaacs 1989). The three main factors affecting distribution of nests and territories include: 1) nearness to water and availability of food, 2) suitable trees for nesting, perching, and roosting, and 3) the number of breeding-aged eagles (Stalmaster 1987).

Wintering bald eagles generally concentrate in areas where food is abundant and disturbance is minimal. The birds use perches near feeding areas during the day, which are typically isolated areas in old-growth and mature stands that have trees larger than the surrounding trees; the perches also provide views of foraging areas. Night roost trees are chosen according to their diameter and growth form. The canopy of night roost trees provides protection from inclement weather and disturbances (USFWS 1986).

Important food items during fall and winter include carrion such as "spawned out" salmon taken from gravel bars along wide, braided river stretches (Stalmaster et al. 1985, Stalmaster 1987). Anadromous and warm-water fishes, small mammals, carrion, waterfowl, and seabirds are among the most prevalent food items consumed during the breeding season (Anderson et al. 1986, USFWS 1986).

Marbled Murrelet

The marbled murrelet was federally listed as threatened on September 28, 1992 (57 FR 45328). Critical habitat was designated on May 24, 1996 (61 FR 26256). In North America, marbled murrelets range along the Pacific coast from Alaska south to central California. Wintering birds have occasionally been found in southern California. Puget Sound has one of the more concentrated marbled murrelet populations of California, Washington and Oregon (USFWS 1997). An account of the taxonomy, ecology, and reproductive characteristics of the marbled murrelet is found in: the 1988 Status Review (Marshall 1988); the final rule designating the species as threatened; the Service's biological opinion for Alternative 9 (USFWS 1994) of the FSEIS (USDA and USDI 1994); the *Ecology and Conservation of the Marbled Murrelet* (Ralph et al. 1995a); the final rule designating critical habitat for the species (61 FR 26256); the recovery plan for the species (USFWS 1997); and, the biological opinion on the Simpson Habitat Conservation Plan (USDI 2000). The following summarizes some of this information.

The population size of murrelets in Washington, Oregon, and California has been estimated at 18,550 to 32,000 (Ralph et al. 1995b). The large range in the population estimate is a result of two widely divergent population estimates in Oregon. Based on demographic analyses, Beissinger and Nur (1997) estimate the murrelet population to be declining at a rate of at least 4 percent per year and perhaps as much as 7 percent per year in Washington, Oregon, and California.

Ralph et al. (1995b) summarized some of the reasons for variability in population estimates among researchers, including differences in methodology, assumptions, spatial coverage, and survey and model errors. Nevertheless, both Ralph et al. (1995b) and the Marbled Murrelet Recovery Team (1994) have concluded that the listed population appears to be in a long-term downward trend. The Marbled Murrelet Recovery Team estimates that the population may be declining at rates of between 4 and 12 percent, which means that in 20 years the population could be less than one-half to one-twelfth its current size.

In Washington, Speich and Wahl (1995) concluded that murrelet populations are lower now than they were at the beginning of the century. Total estimates for Washington, which were derived from surveys conducted in the early 1980s, are about 5,500 murrelets (Speich and Wahl 1995). Based on surveys conducted in 1993, Varoujean and Williams (1995) estimated that 3,250 murrelets occur on the outer coast of Washington and the western portion of the Strait of Juan de Fuca.

Nesting habitat is crucial to murrelets. Unlike other alcids, marbled murrelets nest inland in mature and old growth coniferous forests as far as 52 miles from the ocean (Marshall 1989). In Washington, Oregon, and California, murrelet nests have been found in trees. South of the Alaskan tundra, murrelets nesting occurs within mature or old growth coniferous forests within 50 miles of the ocean (Carter and Erickson 1988, Hamer and Cummins 1990, Hamer and Cummins 1991, Nelson 1989, Nelson 1990, Paton and Ralph 1990, Sealy and Carter 1984).

Murrelet nests have been found on platforms or broad surfaces that are formed by large limbs, moss, branches deformed by diseases such as mistletoe, or damaged branches. Suitable nesting platforms are found most commonly on older trees. Most nests are directly under overhanging branches, which may provide protection from harsh weather and predators. The Pacific Seabird Group defines potential nesting habitat as 1) mature (with or without an old growth component) and old growth coniferous forests; and 2) younger coniferous forests that have deformation or structures suitable for nesting (Ralph et al. 1993). Preferred tree species are Douglas-fir, coast redwood, western hemlock, Sitka spruce, or western red cedar. Because murrelets are seabirds, their nesting habitat must be within flight distance of a marine environment (USDA Forest Service et al. 1993).

The loss of nesting habitat (older forests) has generally been identified as the primary cause of the marbled murrelet's population decline and disappearance across portions of its range (Ralph et al. 1995a). Prey resources and nesting habitat are identified as the two main factors which can

affect seabird populations (Cairns 1992 *in* USFWS 1997). As the proposed project may affect the marine environment as opposed to nesting habitat, we will focus on the former aspect of the environment.

Marbled murrelets typically are found foraging within 0.6 miles to 1.2 miles from shore (USFWS 1997). Marbled murrelets feed mostly in near-shore marine waters and in inland saltwater bays and sounds, and occasionally inland freshwater lakes (Marshall 1989). They often gather at the mouths of rivers. Many prey species concentrate in specific nearshore areas where conditions concentrate lower trophic levels which are food for marbled murrelet prey species. In areas were marbled murrelet prey are concentrated, foraging marbled murrelets have also been concentrated (Carter 1984 *in* USFWS 1997, Carter and Sealy 1990 *in* USFWS 1997).

Marbled murrelets are considered opportunistic foragers. They are known to feed on invertebrates as well as fish. Mysids, gammarid amphipods and euphausiids invertebrates have been identified as important forage species during various times of the year and in certain localities. Invertebrate species appear to be more important during the winter and spring, as opposed to the summer breeding period. The prey is known to differ by species and/or its size between that eaten by adults versus chicks (Sealy 1975 *in* USFWS 1997, Carter 1984 *in* USFWS 1997, Carter and Sealy 1990 *in* USFWS 1997, Burkett 1995).

In the Pacific Northwest, the main fish prey for marbled murrelets has been identified as Pacific sand lance (*Ammodytes hexapterus*), Pacific herring (*Clupea harengus*), northern anchovy (*Engraulis mordax*), and smelt (Osmeridae) (USFWS 1997). Marbled murrelets have been seen occasionally foraging on salmonids in inland lakes in British Columbia and Washington (Carter and Sealy 1990 *in* USFWS 1997).

While declines in forage species may affect marbled murrelet populations, little information on any direct effect is available. Declines in species such as the Pacific herring have been documented in parts of Puget Sound (Burkett 1995, WDFW 1995 *in* USFWS 1997). However, the spawning biomass of Pacific herring has remained stable over the last 20 years (WDFW 1995 *in* USFWS 1997).

Marbled murrelets may shift their feeding areas in response to changes in prey in localized areas. Marbled murrelets are known to shift their nearshore foraging areas between years off of the Oregon coast (Strong 1995). Marbled murrelets may change their foraging area by up to 50 miles, based on daily foraging distances from nest sites and feeding areas (Carter and Sealy 1990 *in* USFWS 1997, Jodice and Collopy 1995 *in* USFWS 1997, Kuletz et al. 1995).

Some anthropogenic impacts to marbled murrelets in marine waters include mortality from gill nets, oil spills, and other marine pollution. The actual number of net mortalities in Washington is low. These impacts are addressed in the biological opinions for Puget Sound area non-treaty commercial salmon net fisheries (USFWS 1996) and the treaty commercial salmon net fisheries in the Strait of Juan de Fuca and Puget Sound (USFWS 1999b). Oil pollution is a significant

threat or conservation problem in southern Alaska, southern British Columbia, Washington, and California (King and Sanger 1979 *in* USFWS 1997, Wahl et al. 1981, Sealy and Carter 1984, Carter and Erickson 1988, Carter and Erickson 1992 *in* USFWS 1997, Marshall 1988, Carter and Kuletz 1995 *in* USFWS 1997). Oil spills include large spills, such as the 1991 Tenyo Maru spill off the Olympic Peninsula, Washington to small spills which may result from tank cleaning and bilge pumping. Other marine pollution which may affect marbled murrelets includes chemical contaminates which enter the water way via direct dumping and effluent from onshore sources. Marbled murrelets in Washington which were analyzed for contaminants appeared to be within the normal ranges for seabirds from clean environments (Grettenberger et al., in prep.).

Habitat Conservation Plans

The range-wide status of the bald eagle, marbled murrelet and bull trout has been affected by a number of recent Habitat Conservation Plans (HCPs) that were prepared in conjunction with incidental take permit applications to the Service pursuant to Section 10(a)(1)(B) of the Act.

Six HCPs have been completed within Washington. The following summarizes the anticipated and/or permitted take of bald eagles, marbled murrelets, and bull trout for the HCPs which include these species:

- West Fork Timber Co. HCP (formerly Murray Pacific HCP): bald eagle, marbled murrelet
- Port Blakely L.P.- Robert .B. Eddy Tree Farm HCP: bald eagle, marbled murrelet
- Washington Department of Natural Resources (WDNR) HCP: bald eagle, bull trout, marbled murrelet
- Seattle Public Utility's Cedar River Watershed HCP: bald eagle, bull trout, marbled murrelet
- Plum Creek Timber Company I-90 HCP: bull trout, marbled murrelet
- Simpson Timber HCP: bald eagle, bull trout, marbled murrelet,

West Fork Timber Co. HCP (formerly Murray Pacific HCP)

The West Fork Timber Co. HCP 100-year amended incidental take permit for the 53,527-acre Mineral Tree Farm, located in Lewis County in western Washington, was approved in June, 1995. Although no marbled murrelet occupancy has been identified by current surveys, the amended permit allows incidental take of murrelets associated with 800 acres out of 1,091 acres of potential murrelet habitat. If murrelets occupy potential habitat in the future, some incidental take may occur as a result of disturbance.

The HCP does not anticipate the incidental take of bald eagles, although bald eagles are a "covered" species under the terms of the permit.

Port Blakely L .P.- Robert B. Eddy Tree Farm HCP

The Port Blakely Tree Farms, L. P. 50-year incidental take permit for the 7,486-acre R. B. Eddy Tree Farm, located in Pacific and Grays Harbor counties in southwest Washington, was approved in July, 1996. No modification nor disturbance of known occupied murrelet sites is authorized under the HCP. However, due to the possibility that habitat surveyed in the first 5 years of the plan could eventually become occupied in the future, incidental take may result from harvest of 210 acres of deferred habitat and 250 acres of habitat that may develop in Riparian Management Zones. In addition, incidental take from disturbance due to harvest may occur during the nesting season. The HCP permits the incidental take of up to 25 wintering eagles due to harvest of wintering habitat.

City of Seattle for the Seattle Public Utility's Cedar River Watershed HCP

The City of Seattle for the Seattle Public Utility's Cedar River Watershed HCP permitted the take of an undetermined number of marbled murrelets associated with one known occupied stand and an unknown number of other occupied stands over a 50-year period as a result of the proposed action. The number of marbled murrelets taken annually could not be determined. Specifically, incidental take of marbled murrelets was authorized within the watershed as a result of 14,400 acres of forest restoration (ecological and restoration thinning, and conifer under-planting), 240 miles of road removal, and 380-520 miles of on-going road maintenance, and as much as 4 miles of streambank stabilization and re-vegetation work and 50 in-stream wood placement projects over the term of the HCP.

The incidental take permit for the HCP allowed an undetermined number of bald eagles to be taken over a 50-year period as a result of this proposed action. The number of bald eagles taken annually could not be determined. However, the number of bald eagles expected to be taken is very small, both because of the low number of bald eagles thought to occur within the watershed at this time (only transients and migrants and no known nesting activity), and due to the level of protection provided by the HCP.

Two harm and harassment estimates of take were determined for bull trout based on the assumption that this species occurs throughout lands managed by the City of Seattle.

The incidental take permit for the HCP allows the take of bull trout associated with 420 acres of restoration thinning (0 to 30-year old trees) conducted in the first fifteen years on the HCP and 150 acres of ecological thinning (30 to 60-year old trees) over the full term of the HCP. It also included take associated with maintenance of 520 miles of currently maintained roads, and with the ground disturbance associated with removing about 240 miles of existing roads during the first 20 years of the HCP. However, by year twenty of the HCP, the total maintained road mileage will drop to approximately 380. Some incidental take in the form of harm associated with improvement of about 4 miles to 10 miles of road per year is also anticipated.

Incidental take of bull trout in the Chester Morse Lake/Masonry Pool system occurs from entrainment through two intakes devices, the Cedar Falls Hydroelectric Project at Masonry Dam

and the Overflow Dike into Masonry Pool. It is expected that no more than seven percent of the estimated bull trout population in that system will be killed per year through any combination of these intake devices. Take is also expected to occur due to inundation of redds and preventing spawners from accessing the tributaries of the reservoir by unusually low water levels in the reservoir. Studies have shown that less than ten percent of the bull trout redds in the Cedar River have been located below the normal high pool elevation of 1,563 feet. Thus, these lower elevation redds would be subject to take every year. Nearly all (~95 percent) Rex River bull trout redds were annually located below 1,563 feet. Therefore, these redds would be subject to some form of take, because they can be reasonably expected to be inundated for some duration before juvenile bull trout emerge. Reservoir management zones of "Infrequent" (2) and "Very Infrequent" (1) are expected to take more bull trout than the "Normal" (3) operating zone. Zone (2) and (1) are expected to occur once every ten and fifty years, respectively, with durations exceeding one week. Short durations of spawner impedance can be expected to occur in the reservoir management zone (Appendix 38) of "Normal" (3) every year, but periods longer than one week will only occur once every four years. Spawner blockage is not expected to occur in the "Normal" (3) zone. The "Infrequent" zone (4) is expected to occur with a frequency of one in ten years where both spawner impedance and blockage is expected to occur with durations of one to three weeks. The "Very Infrequent" zone (5) will impede and block spawners, but is expected to occur only once in fifty years.

Plum Creek Timber Company I-90 HCP

The Plum Creek Timber Company I-90 HCP addressed about 170,600 acres for 50 to 100 years in King and Kittitas Counties, Washington. The permit allows incidental take of murrelets associated with up to 400 acres of unsurveyed low-quality habitat west of the Cascade Crest and 1,400 acres of unsurveyed land east of the Crest. The amended HCP to address the I-90 land exchange in 1999 permitted the additional take of 721 acres of low-quality suitable habitat or marginal habitat west of the Cascade Crest. Also, some portion of 1,741 acres of nonhabitat (Mature Forest Structural Stage) west of the Cascade Crest, could eventually become habitat during the 100-year permit, and subsequently subject to harvest without surveys.

The Plum Creek Timber Company's HCP amended the HCP (USDI 1998a) to include the Columbia River DPS of bull trout. The amendment allowed for the take of bull trout associated with habitat degradation/loss due to 150 acres of selective and thinning/restoration-oriented silvicultural harvest per year, 2 miles of stream restoration per year, and 20.2 miles of road construction, maintenance, and removal per year.

WDNR's HCP

The WDNR incidental take permit for 1.6 million acres of State forest land in the State of Washington was approved on January 30, 1997. The 70-year permit covers all WDNR-managed lands within the range of the spotted owl and authorizes incidental take occurring from commercial forest activities as well as non-timber resource activities. The HCP permits the

incidental take (in the form of harm) of all bald eagles associated with the harvest of 200,000 acres of forested habitat over the life of the HCP. In addition, incidental take (in the form of harassment) of bald eagles due to disturbance may occur on a total of 2,402,820 acres over the life of the HCP. This disturbance is due to both forest (i.e., harvest) and non-forest resource activities. Incidental take was issued for bald eagles under the WDNR HCP. However, inadvertent incidental take of bald eagles will be minimal because the DNR will actively conserve known nest sites.

Approximately 376,000 acres of State Forest land occurs within the Olympic Peninsula. Of this 376,000 acres, 23,836 acres of suitable murrelet habitat are scheduled for harvest under the HCP. In addition to habitat removal, disturbance related take for marbled murrelets due to timber harvest and non-timber resource activities may occur on 6,402 acres per year for the first decade of the HCP on the Olympic Peninsula.

The WDNR's HCP amendment (USDI 1998b) to include bull trout allowed for incidental take of bull trout associated with habitat degradation/loss due to 29 miles of road construction and maintenance per year, and 158 acres of selective and thinning harvest per year. This amendment added only the Coastal/Puget Sound DPS of bull trout to the WDNR's HCP.

Simpson Timber HCP

The Simpson Timber incidental take permit was issued on October 12, 2000. The HCP encompasses the Plan Area of 261,575 acres and approximately 640,000 acres of additional lands (known as the Assessment Area) surrounding the Plan Area. The Assessment Area lands are not currently owned by Simpson, but may be in the future. All lands occur in Mason, Grays Harbor, and Thurston counties. The incidental take permit authorizes take of bald eagles, bull trout, and marbled murrelets associated with commercial timber harvest and land management activities for a period of 50 years.

The FWS authorized incidental take of marbled murrelets in the form of harm, as a result of harvest of up to a total of 315 acres of suitable marbled murrelet (but currently unoccupied) habitat outside of Riparian Conservation Reserves (RCR). Take, in the form of harassment, due to disturbance of undiscovered nesting marbled murrelets, is anticipated to occur. Specifically, the FWS authorized take of marbled murrelets due to disturbance associated with timber harvest activities within the Plan Area, on potentially covered lands allowed to be added per Provision 10 of the Implementing Agreement (IA), and those immediately adjacent (within one mile) of the Plan Area. The FWS authorized take of marbled murrelets, due to harassment, as a result of activities near suitable habitat within the RCRs that are currently occupied, or which could become occupied over the proposed incidental take permit term (162 acres expected to develop within the RCR by the year 25, and 1231 acres are expected to develop within the RCR by the year 50 of the incidental take permit term). Marbled murrelets could be taken due to harassment as a result of harvest of trees outside of, but adjacent to RCRs. The FWS authorized take for marbled murrelets associated with habitat outside of RCRs that becomes occupied prior to being

harvested, and for marbled murrelets associated with occupied habitat outside of the RCRs as a result of harvest of trees within 300 feet of such habitat. The FWS authorized take, due to harassment, of marbled murrelets associated with habitat that is within 0.25 mile of up to 250 miles of new road construction over the term of the HCP, a small portion of which may be as close as 300 feet to occupied marbled murrelet habitat, and for activities associated with potential remediation of a maximum of 2,001 miles of system roads (during the first 15 years of the proposed permit term,100 percent of all roads needing remediation would have such work completed; thus all potential take associated with road remediation would occur within the first 15 years of the permit term). The FWS authorized take due to harassment of all marbled murrelets associated with activities in habitat adjacent to a maximum of 6,160 acres of experimental thinning sites over the proposed ITP term, where timber harvest may occur. A small portion of the 6,160 acres could be adjacent to occupied marbled murrelet habitat (but would not occur within suitable or occupied habitat). The FWS anticipated take due to harassment for all marbled murrelets within one mile of any blasting activities occurring between September 1 and September 15 of any given year. Take due to harassment of marbled murrelets is not authorized during the time period April 1 through August 30 for blasting, as Simpson has stated that they would not blast during this time period near marbled murrelets. Take may occur on an unknown number of acres due to blasting in an unknown number of sites and locations over the life of the HCP, potentially causing nesting upset, loss of eggs, or nest abandonment if this blasting occurs proximal to nests. The FWS anticipated take in the form of harassment in limited areas of the Plan Area involved in proposed Covered Activities that were subject to protocol surveys and determined to be unoccupied, but become occupied during the ITP term.

The FWS authorized bull trout take as a result of timber harvest and experimental thinning associated with stream habitats on 2,987 acres (187 acres in the first 10 years of the permit term, and up to 5,973 (total of 6,160 acres minus 187 acres) for the remaining 40 years of the permit term. In addition, the FWS authorized take for bull trout associated with habitat adjacent to 250 acres of new road construction, and with habitat adjacent to potential remediation of 2,001 miles of system roads (during the first 15 years of the proposed permit term, 100 percent of all roads needing remediation would have such work completed). By year 15 of the HCP, effects to bull trout habitat resulting from road remediation should be eliminated.

The FWS authorized take, in the form of harassment, due to disturbance of all bald eagles associated with timber harvest adjacent to bald eagle roosting habitat, a maximum of 250 miles of new road construction, a maximum of 2,001 miles of system road remediation within the first fifteen years of the proposed ITP term, and a maximum of 6,160 acres of experimental thinning. Only winter roosting and migrant bald eagles are currently known from the Plan Area; no nesting activity is currently known. The communal roost site supports approximately 30 bald eagles. A small amount of nesting is likely to occur during the proposed ITP term within the Plan Area. Nesting during the proposed permit term is more likely within lands allowed to be added for coverage per Provision 10 of the IA, particularly near Puget Sound (nesting activity in this area is currently undetermined). The number of bald eagles anticipated to be taken is small, but the potential for take to occur is moderate. A small number of bald eagles are expected to occur

within the Plan Area and environs during the proposed permit term as most of the potential habitat is in a relatively young successional stage, and a relatively small amount of high function perching and nesting habitat is expected to develop during the proposed ITP term.

ENVIRONMENTAL BASELINE (in the action area)

Bull Trout and Aquatic Resource Conditions

The proposed project is located within and adjacent to the Green River Sub-Population of bull trout. Very limited information is available on the status of bull trout in this sub-population of the Coastal/Puget Sound DPS.

Green River

Very limited information is available on the status of bull trout in the Green River basin. Extensive surveys specifically for bull trout have not been conducted in the Green River. Bull trout are presumed to occur in very low numbers in this system. It is unknown how bull trout specifically use the Green River and its tributaries, although it is likely used for foraging, and migration for the purpose of this BO. However, there is unlikely to be any suitable spawning habitat in the action area. No spawning locations are known (WDFW 1998). The life history forms of bull trout in this drainage are not known; however, they are likely to be anadromous and/or fluvial. Historical accounts suggests that bull trout were once common (Suckley and Cooper 1860). However, creel counts on the Green River, dating from 1940, indicate bull trout are now extremely rare, with only four char taken by over 35,500 anglers checked between 1940 and 1973 (Cropp *in* WDW 1993). Though few in number, Cropp (*in* WDW 1993) indicated that char are still occasionally caught in the Green River. A native char was caught in May 1994 in the Duwamish River that was positively identified as a bull trout both by Haas measurements and by genetic work (E. Warner, Muckleshoot Indian Tribe, pers. com. 1997). Eight native char were caught in the turning basin of the Duwamish River Estuary near river mile (RM) 1.5 in August and September, 2000 (Taylor Associates 2001). Positive identification as bull trout has been established by genetic analysis for two of the six fish; the remaining fish have not been analyzed to date (W. Mavros, King County, pers. com. 2001a). Watson and Toth (1994 *in* WDFW 1998) state that native char have been harvested in the Green River as far upstream as RM 64. More recently, a bull trout, as determined by genetic work, was caught at the mouth of Newaukum Creek off the mainstem of the Green River, approximately 40 miles upstream from the mouth of the Green/Duwamish River (E. Warner, Muckleshoot Indian Tribe, 2000). Plum Creek Timber Company has conducted presence/absence surveys for bull trout in the upper Green River watershed above Howard Hanson dam, with no presence documented.

Mongillo (1993) listed bull trout in the Green River as a remnant population, with status unknown, and with an immediate need for data. WDFW (1998) lists the Green River population as unknown status. The FWS believes the status of this subpopulation is depressed, based on available information that indicates native char occur in very low numbers in comparison to

historic levels. Total abundance for the subpopulation is believed to be less than 5,000 individuals or 500 adults.

The Green River and its tributaries presently provide only poor to fair habitat for bull trout because of industrial, residential and agricultural developments along the lower and middle reaches of the Green River and its tributaries, the presence of two dams at RM 61 and 64.5, and extensive timber harvest in the upper basin. These activities have resulted in the increase in fine sediments, a severe reduction in the riparian corridor, constriction of the river channel and isolation from its floodplain, a reduction in channel complexity and habitat diversity, instream flow reductions, alteration of the natural flow regime, elevated water temperatures, the interruption of the transport of large woody debris and spawning gravels, and the blockage of access to upstream habitats.

Bull trout spawning habitat is limited by the availability of suitable substrate and water temperatures. The Green River channel below Howard Hanson Dam and extending downstream to near Flaming Geysers Park is largely armored due to the interception of coarse sediments by Howard Hanson Dam (Perkins 1999). A large landslide near Flaming Geysers State Park and several tributaries, including Soos, Newaukum and Burns Creeks, contribute large amounts of fine sediment. Most of the tributary streams are also impacted by sedimentation. The temperature of the water released from Howard Hanson Dam may be too high for successful bull trout spawning and incubation in the Green River downstream from Howard Hanson Dam, but springs entering the channel bed may provide suitable conditions. Some of the spring fed tributaries, both upstream and downstream of Howard Hanson Dam, may also provide suitable spawning and incubation habitat.

Bull trout rearing habitat is likely limited by high water temperatures and the relative lack of channel complexity and habitat diversity. The Green River has been listed as water quality impaired by Washington Department of Ecology (WDOE) (WDOE 2000). It is on the 303(d) list for the following parameters: elevated temperatures, metals, ammonia, fecal coliform bacteria, pH, low dissolved oxygen, and high biochemical oxygen demand. However, State temperature standards themselves may not be adequate for bull trout given that the temperature standard for the highest class of waters is 16 ° C, whereas temperatures in excess of about 15 ° C are thought to limit bull trout distribution (Rieman and McIntyre 1995). The removal of riparian vegetation and large woody debris from the system, the confinement of the channel by levees and riprap, the elimination of the channel forming flood flows, water withdrawals, and reduced groundwater recharge have all contributed to degradation of bull trout rearing habitat. As a consequence, the Green River mainstem probably provides suitable rearing habitat for only a portion of the year, with spring fed tributaries providing summertime refuge.

The Green River and many of its tributaries provide suitable foraging habitat for bull trout, given the significant number of chinook, coho (*Oncorhynchus kisutch)* and chum salmon, and steelhead trout that are produced within the basin. Other potential prey resources include sculpins, suckers,

whitefish, and crayfish, as well as a number of estuarine and marine species within the tidally influenced portion of the lower river.

Gilliam Creek

Gilliam Creek basin is highly developed by urban land uses. This has resulted in increased peak flows and runoff due to impervious surfaces. The creek is scoured and eroded in its upper reaches, with sediment deposition in the lower reaches. Gilliam Creek drains into the Green River with its confluence at RM 12.7. Its basin is composed of 2.9 square miles. The creek has been fragmented by streets, freeway crossings, residential and commercial development, and wetland fill.

Gilliam Creek does not have a specific water quality designation by the WDOE. The water quality designation is determined by its receiving water, the Green River (City of Tukwila 2000), which is currently listed as impaired.

Chinook, coho, chum, steelhead, and sea-run cutthroat (*Oncorhynchus clarki clarki*) have been reported from Gilliam Creek (Partee1999 pers. com. *in* City of Tukwila 2000, Jones and Stokes 1990 *in* City of Tukwila 2000). Partee (2000) reports that the correct list for Gilliam Creek is chinook and coho salmon, and cutthroat trout. Partee (2000) has identified juvenile chinook salmon in the lower reaches of the creek. Pacific lamprey (*Lampera tridentata*), river lamprey (*L. ayresi*), rainbow trout (*Oncorbynchus mykiss*), western brook lamprey (*L. richardsoni*), cutthroat trout (*O. clarki*), sculpin (*Cottus* sp.), longnose dace (*Rhinichthys cataractae*), largescale sucker (*Catostomus macrocheilus*), three-spine stickleback (*Gasterosteus aculeatus*), and speckled dace (*R. osculus*) may also occur within this creek system (Wydoski and Whitney 1979). There is a flap gate where Gilliam Creek drains into the Green River. Anadromous fish access to Gilliam Creek is therefore limited, although access by juveniles does occur. There is potential salmon spawning and rearing habitat in the lower reach of the creek (City of Tukwila 2000).

Miller Creek, Walker Creek and Miller Creek Estuary

The Miller Creek Watershed is approximately 8 square miles in size. The creek is approximately 4 miles long. At RM 1.8, the creek flows through a ravine. Miller Creek has been altered as a result of the loss of riparian habitat, and impervious surfaces which has lead to stream degradation. The estimates of the amount of impervious surfaces range from 23 percent to 49.4 percent.

Benthic macroinvertebrate sampling was performed in Miller Creek. A benthic index of biotic integrity (B-IBI) of 10 was scored. B-IBI scores tend to decrease with increasing impervious areas. B-IBI may be as high as 40 plus in Puget Sound lowlands for areas of low impervious surface (Kleindl 1995 *in* Karr and Chu 1999). Low B-IBI scores in Puget Sound creeks have

indicated habitat degradation. Miller Creek has not been listed by WDOE as an impaired stream (WDOE 2000).

The streambank and riparian condition are variable. The upper sections of the creek are within urbanized areas, with housing in close proximity to the stream. Native and non-native vegetation occurs along the streambanks, providing some canopy cover and detrital matter. Some sections of the creek have been stabilized with hardened structures. The lower section winds through a private park, which includes its estuary. The park is primarily a grassy area with deciduous trees. The estuary banks are confined by riprap. The shoreline adjacent to Miller Creek is predominantly gravel and sand, with some driftwood. The intertidal zone at the mouth of the creek is composed predominantly of mixed gravel and sand. The creek channel in the upper intertidal zone contains more cobble than adjacent areas. The estuary channel is vegetated with green algae.

A water fall at RM 3.1 may be a migration barrier for anadromous fish. No anadromous fish have been reported upstream of this location, to date. Bull trout are known to ascend waterfalls that other anadromous fish are unable to pass. No bull trout have been noted within the creek. Bull trout may use the Miller Creek estuary for foraging. It is unlikely that they forage upstream of tidal influence due to the low forage base produced in the stream, high water temperatures, lack of cover, and their inability to osmoregulate rapidly.

Threespine stickleback, pumpkinseed sunfish, black crappie, and cutthroat trout have been found upstream of the water fall. Cutthroat and coho have been detected rearing below the falls. Chum salmon spawn in lower Miller Creek. Five chum redds were located in the lower 1.75 miles of the creek during the 1998-1999 spawning period.

Walker Creek is a tributary to Miller Creek. It enters Miller Creek at approximately 300 ft upstream from the mouth of Miller Creek. Its watershed is primarily urbanized. Its channel is approximately 3-ft wide and is incised approximately 1.5 ft. The creek is tidally influenced to approximately 100 ft of a control weir. Walker Creek is an anadromous fish bearing stream. Coho and chum salmon redds, and potentially a cutthroat trout redd have been located in the lower sections of the creek.

Des Moines Creek and Estuary

The Des Moines Creek Watershed is approximately 5.8 square miles. The watershed is urbanized, with approximately 35 percent impervious surface. Most of the stream in the upper watershed has been placed in culverts, road side ditches and drainage pipe. The creek is 3.5 miles long, beginning on a plateau, and then descending through a ravine before it reaches Puget Sound. The Des Moines Creek estuary is located within the Des Moines Creek Beach public park. Prior to flowing into the estuary, the creek flows through the park, and under buildings which span the creek.

Des Moines Creek is listed as a 303(d) stream by the WDOE (WDOE 2000). It is listed as an impaired water due to high fecal coliform levels.

Fish production in Des Moines Creek is limited due to fish barriers, high stream flows, limited rearing and overwintering habitat, low summer flows, low dissolved oxygen, and high water temperatures (Des Moines Creek Basin Committee 1997). Due to high flows, some areas of the creek have eroded, and the stream bed has been scoured of gravel.

Bull trout have not been noted within Des Moines Creek. Bull trout may use the creek estuary for foraging. It is unlikely that they forage upstream of tidal influence due to the low forage base produced in the stream, high water temperatures, lack of cover, and their inability to osmoregulate rapidly.

In the lower reaches of the creek, coho and chum salmon, steelhead, and cutthroat trout have been seen. Some spawning in the lower reaches also occurs. A culvert at Marine View Drive (RM 0.4) limits the migration of fish to spawn upstream. In 1998-1999, 22 coho redds were found in the first 1.24 miles of Des Moines Creek, with 21 of these redds in the first half mile. Sixteen chum redds were found during this same time period in the first half mile of the creek.

Puget Sound

Limited information regarding bull trout use of marine waters is available. No specific sub-population unit is specified for Puget Sound. Bull trout are known to use these waters for migration and foraging.

Puget Sound has been significantly altered from its original condition. It has been estimated that one-third of the shoreline in Puget Sound has been altered (PSWQAT 1998). In the eastern side of Puget Sound's main basin, which includes the action area, approximately 80 percent of the shoreline from Mukilteo to Tacoma has been altered (PSWQAT 1998). It is not known how the distribution of eelgrass has been affected over time. Eelgrass is important spawning and rearing habitat for bull trout forage fish.

Declines in populations, productivity and survival of a number of organisms that live in Puget Sound have been noted in recent years. This includes declines in the spawning runs of Pacific herring, rockfish stocks, and coho salmon, as well as declines in over-wintering grebes and scoters (PSWQAT 1998).

The distribution of the char in marine waters is believed to be closely tied to the distribution of the bait fish, especially their spawning beaches. A sandlance spawning area is known from less than one mile north of the Miller Creek estuary. Surf smelt spawning areas are identified approximately one mile north and south of the Des Moines Creek estuary (WDFW 2000). Marine observations of native char, including bull trout, nearest to the proposed project site have

occurred in the turning basin of the Duwamish River and at Shilshole (W. Mavros, King County, pers. com. 2001b).

Toxic contaminants have also been released into Puget Sound from various sources, degrading the aquatic habitat. Some contaminants are in declining levels, which may be a result of improved pollution control. However, there is some evidence that polyaromatic hydrocarbons may be increasing in some areas. There has been a higher incidence of liver lesions in English sole in Elliot Bay, which may be the result of increased polyaromatic hydrocarbons (PSWQAT 1998). The WDFW is conducting tests on Pacific herring, a forage species for bull trout and marbled murrelet, to monitor the pollutants in Puget Sound (PSWQAT 1998). Results from the1995 pilot study in Fidalgo Bay showed that Pacific herring accumulated the same type of contaminants that have been observed for other species in Puget Sound. Some of the contaminants detected included polychlorinated biphenyls (PCB's), dichloro diphenyl dichloroethane (DDD) and dichloro diphenyl dicholorethylene (DDE) (metabolites of dichloro diphenyl tricholoroethane)(DDT)), and metals (i.e., mercury). These levels were within the range of that observed for other Puget Sound fish species (PSWQAT 1998). The Washington State Puget Sound Ambient Monitoring Program in the future plans to monitor the effects of PCB accumulation in the Puget Sound food webs (PSWQAT 1998).

Sea-Tac currently uses deicers, flocculents, petroleum products, pesticides, and herbicides which may enter the ground and surface water. Existing treatment facilities reduce but may not eliminate these contaminants in the aquatic system. Existing levels of potential contaminants, such as copper (Cu) and zinc (Zn), may be at levels which could have acute and/or chronic toxicity effects on aquatic species.

Des Moines Creek and Miller Creek, and discharges from the industrial wastewater system (IWS) may currently exceed lethal and sub-lethal toxicity levels for bull trout and their forage species for Cu and Zn (Eisler 1998) (Table 2). Except for lethal levels for Zn, all potential impacts are based on values available for other fish species. There is currently no specific information available for bull trout regarding Cu toxicity or sublethal effects of Zn.

Table 2. Cu and Zn concentrations within action area and sublethal and acute toxicity values for fish species, including bull trout.

Chemical	Location		
	Mouth of Miller Creek	Mouth of Des Moines Creek	IWS Outfall
Cu, existing levels, micrograms/liter[1](µg/L)	7 - 45	10 - 24	2 - 30

Cu sublethal effects (µg/L)[2]	4 - 10		
Cu LC_{50} toxicity value (µg/L)[3]	42 - 110		
Zn, existing levels (µg/L)[1]	35-234	24-60	7-103
Zn, sublethal and lethal effects (µg/L)[4]	50-235 4.9-9.8 for the brown trout (*Salmo trutta*)		
Zn LC_{50} toxicity value for bull trout, (µg/L)[5]	31.9-86.9		

1 Adapted from BA, Tables 7-10 and 7-11.

2 Eisler 1998.

3 Adapted from BA, Table 7-12.

4 Eisler (1993).

5 96 hour and 120 hour exposures at variable temperatures (8° C and 12° C), pH (6.5 and 7.5) and hardness (30 mg/L and 90 mg/L), and based on Spearman-Karber and Probit statistical analyses, Stratus Consulting, Inc. (1999).

Tempo, Banner, Triester, Cidekick, Diuron, Roundup, Crossbow, and Deluxe Turf with Trimec are included on the list of pesticides and herbicides that may be used on Sea-Tac. Tempo and Diuron have not been used. The Landscape Management Plan for Sea-Tac currently imposes a 50 ft buffer around waterbodies. A buffer of 50 ft may not adequately prevent some of these chemicals from entering the aquatic system via surface water and/or groundwater. This plan does not apply to the proposed mitigation areas and their buffers (J. Kelley, Parametrix, Inc. pers. com. 2000).

Cationic polyacrylamides (PAM) are currently used at Sea-Tac, and are proposed for continued use to reduce suspended solids from its treatment systems. Sojka and Lentz (no date) state that neutral and especial cationic PAMs have been shown to have LC_{50}s low enough for concern to certain aquatic organisms, whereas, anionic PAMs do not. Cationics are attracted to the hemoglobin in fish gills, which may result in suffocation. It is noted, however, that when PAMs are used in waters containing sediments, humic acids, or other impurities, the effects of PAMs on biota are buffered greatly (Buchholz 1992 *in* Sojka and Lentz (no date), Goodrich et al. 1991 *in* Sojka and Lentz (no date).

Bald Eagle

The action area is located in the Puget Sound Management Zone, which has the highest density of nesting bald eagles in Washington. In 1998, 298 occupied territories were documented (WDFW data), which far exceeds the recovery objective of 115 territories.

No bald eagle nest sites are located within the action area. The nearest nest is approximately one mile east of the action area, near Angle Lake. Bald eagles forage within Puget Sound and the Green River. It is assumed that the bald eagles occupying the Angle Lake nest site forage primarily in Angle Lake, though use of Puget Sound is also possible. Angle Lake has been stocked with rainbow trout and kokanee for a number of years (at least since 1982), therefore providing a very localized forage base for these eagles.

There is currently a risk of airplane strikes with bald eagles at the airport. However, no airplane strikes of bald eagles have been reported to date at Sea-Tac. Bald eagles have been seen on, and flying over and near the airport (Tables 3 and 4).

Table 3. Total bald eagle sightings reported by month at Sea-Tac, 1995 - April 2001.[1]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
2001	3	1 (2)[2]	5	3								
2000			3	1 (2)	1	1			1	3 (5)		
1999					1							
1998	1 (2)	1 (2)		1							1	
1997	1				1							
1996					2 (3)							
1995		2 (3)	1 (2)							1 (2)	1 (2)	1
Total	5 (6)	4 (7)	9 (10)	5 (6)	5 (6)	1	0	0	1	4 (7)	2 (3)	1

[1] Osmek (2001a)

[2] Numbers in parentheses represent actual number of birds sighted.

Table 4. Bald eagle behavior reported at Sea-Tac, 1995 - April 2001.[1]

Behavior	Total	Frequency (percent)
Fly (Passing over)	21 (25)[2]	
Fly (Passing over)/Harassed (by birds)	1	
Total Fly	22 (26)	59
Towering/Soaring	9 (15)	
Towering/Soaring/Harassed (by birds)	1	
Total Towering/Soaring	10 (16)	27
Loafing/Standing	4 (5)	
Perching	1	
Total Loafing/Standing/Perching	5 (6)	14
Grand Total	37 (48)	100

[1] Osmek (2001a)

[2] Numbers in parentheses represent actual number of birds sighted.

Based on the information provided by Osmek (2001a), most bald eagle sightings have been during the nesting and late wintering seasons. The number of bald eagles sighted has increased over the six and a half year period that was reported. This may be due to two factors: an increase in observer effort and an overall increase in bald eagle numbers in Washington.

Observations on the airport include the use of the embankment for loafing and use of the VHF tower for perching (S. Osmek, Port of Seattle, pers. com. 2001b). The embankment is currently about 50 ft higher than the rest of the airport (excluding facilities). Bald eagles have also been seen on the infield of the airport (between the runway and the taxiway) (M. Cleland, USDA, pers. com. 2001). There are likely to be close encounters between bald eagles and airplanes which do not result in airplane strikes. For example, a bald eagle was recently seen hunting over the Tyee Golf Course, in proximity to the end of runway 34R (M. Cleland, USDA, pers. com.2001) when a plane was landing. The majority of landings and take-offs on the runways are from the north heading south (71 percent). Bald eagle sightings at the airport are primarily in the south (65 percent). The largest risk to bald eagles may therefore occur in the southern portion of the airport due to the higher number of bald eagles and take-offs. Airplanes on take-off tend to lift-off at

about the central part of the airport, and reach an altitude of approximately 1000 ft at the end of the airport. Bald eagles are more likely flying at a lower elevation at this point in their use near the airport, especially if they are moving between Angle Lake and Puget Sound.

Bald eagles may also forage near the mouths of Miller and Des Moines Creeks, but specific information on the use of these areas is not known. Due to the developed nature of and associated activity at Des Moines Creek estuary, use by bald eagles is likely to be minimal.

Marbled Murrelet

The action area for the proposed project is located in the Puget Sound Conservation Zone (USFWS 1997) in the marbled murrelet recovery plan. A population estimate for this zone has not been made. However, Speich and Wahl (1992) have estimated that there are approximately 2,600 marbled murrelets for the Strait of Juan de Fuca and Puget Sound. In this management zone, the largest number of murrelets is found in the northern Cascades and east Olympic Mountains and associated marine waters. Murrelets are found most commonly in the near shore waters of the San Juan Islands, Rosario Strait, the Strait of Juan de Fuca, Admiralty Inlet, and Hood Canal. They are more sparsely distributed elsewhere in this region, with smaller numbers observed at various seasons as far south as the Nisqually Reach and Budd Inlet, as well as in Possession Sound, Skagit Bay, Bellingham Bay, and along the eastern shores of Georgia Strait. Aggregations of murrelets are consistently observed in certain locations and at certain seasons. Marbled murrelets use these areas because of food availability, shelter or other ecological factors, and are also affected by the proximity and availability of nesting habitat.

In Puget Sound, few marine surveys have been conducted in the action area, primarily because murrelet occurrence is so infrequent. WDFW conducted surveys of Puget Sound from 1993 through 1995 during the marbled murrelet post-breeding season (Stein, J. and D. Nysewander 1999). Although the survey did not include the area specifically within the action area of this project, it did include areas north and south. These included surveys from Picnic Point to Edwards Point in the north, and Garden Point to Tatsolo Point, transect from Tatsolo Point to Sandy Point, transect from Yoman Point to McNeil Island stack, and shoreline from McNeil Island stack to Hyde Point. As the first survey in 1993 did not locate any marbled murrelets (first survey for Garden Point to Tatsolo Point occurred in 1994), future surveys of these areas were discontinued. The majority of marbled murrelet occurrences were documented in the Hood Canal area (Nysewander pers. com. 2000). Additional information regarding marbled murrelet occurrences in Puget Sound, including summer occurrences, is provided in Table 5. The majority of these occurrences are south of the action area.

Table 5. Marbled murrelet observations in Puget Sound.[1]

Date of Observation	Location	Number of Birds	Observer
NI[2]	Saltwater State Park	NI	T. Bock
NI	Redondo Beach	2 (1 pair)	T. Bock
NI	Narrow's Bridge, Tacoma	2 (1 pair)	T. Bock
NI	Brown's Point	NI	T. Bock
NI	Dash Point to Des Moines	6 (3 pair)	T. Bock
NI	Des Moines	4 (2 pair)	T. Bock
Summer 1990	Des Moines	6	T. Bock
NI	Des Moines	2 (1 pair)	T. Bock
NI	Brown's Point	12	T. Bock
NI	Brown's Point	8 (4 pair)	T. Bock
May 26 - June 3, 1993	Brown's Point	35-40	T. Bock
NI	Brown's Point	15	T. Bock
May 6, 1996	Brown's Point	8	T. Bock
NI	Brown's Point	7 (3 pair)	T. Bock
Summer 1999	Eastern Shore of Vashon-Maury Island	NI	M. Raphael, USFS

[1] Adapted from information provided by Norman, D. 2001 *in* Airport Communities Coalition. 2001.

[2] NI - No information provided.

Anecdotal observations indicate that marbled murrelets may occasionally forage in or near the Miller and Des Moines Creek estuaries on fish produced in these watersheds (including Walker Creek) and which migrate to the estuary and Puget Sound. The use of these estuaries and their vicinity by marbled murrelet, particularly during the breeding season, is likely to be limited due to low numbers of birds nesting in the nearest habitat, and possibly the lack of preferred prey species present in this area.

The number of murrelets nesting in the Cascades east of the action area, and using marine waters

associated with the action area is relatively small. No suitable nesting habitat for marbled murrelets occurs within the action area. Detections of marbled murrelet exhibiting occupied behavior associated with nesting habitat, occur between 17 and 45 miles from the action area. There have been nine marbled murrelet detections (four occupied sites and five detections only) east of Sea-Tac whose flight path mi . cross the airport. It is likely that numbers of marbled murrelets are low in the Cascades east of the proposed project area and in the marine area west of the project area because of the limited availability of suitable nesting habitat and the degraded condition of the marine shoreline as a result of urban development.

Outside of marine areas, observations of marbled murrelets in the vicinity of the action area have been rare. In addition to the detections of marbled murrelets described in the BA, two additional detections of marbled murrelets are provided in the WDFW data base. These occurred approximately 8 miles north and south of the action area. These detections were for a marbled murrelet in flight (1992) and a grounded chick in a person's yard (1974). It is unknown how the marbled murrelet reached the yard, as it still had down, which could indicate a nearby nest. A sandlance spawning area is known to be less than one mile north of the Miller Creek estuary. Surf smelt spawning areas are identified approximately one mile north and south of the Des Moines Creek estuary (WDFW 2000). However, most spawning areas are disjunct from known marbled murrelet feeding areas (USFWS 1997). Certain herring stocks in local areas have probably gone extinct in Puget Sound due to the loss of eelgrass beds, which provide spawning habitat for this species (Pantella, pers. com. 1996 *in* USFWS 1997).

Information does not exist to indicate that, other than Pacific sardine and the northern anchovy in offshore and shelf waters, marbled murrelet prey resources have either increased or decreased in inner Washington waters from historical ranges (MacCall pers. com. *in* USFWS 1997, Pantella pers. com. 1996 *in* USFWS 1997). Although prey species abundance, such as Pacific herring in Puget Sound, may have been reduced in certain areas this is not known to affect the overall prey abundance and their availability for marbled murrelets (USFWS 1997). As a result, insufficient information exists to state that the overall prey abundance and availability have changed to a degree that it affects the maintenance and recovery of marbled murrelet populations.

EFFECTS OF THE ACTION

The proposed action may result in a variety of environmental effects, including short-term negative impacts from construction, and potentially long-term negative impacts from reduced baseflows and increased peak flows in Miller and Des Moines Creeks and chronic and acute toxicity due to chemical contaminants. Longer-term positive effects may result from improved forage fish habitat, and a reduction of sediments and chemical contaminants. There is also a risk of long-term adverse effects due to potential bird strikes from in-coming or out-going airplanes. How these impacts affect listed species will be evaluated below.

Bull Trout

The subpopulation of bull trout in Puget Sound, Miller and Des Moines Creek estuaries, and the Green River is likely composed of individuals from other spawning streams in the Coastal/Puget Sound DPS. Bull trout spawning and rearing habitat are not known to be present in Puget Sound, Miller, Des Moines, Walker, and Gilliam Creek, or the mainstem Green River at this time. Therefore, bull trout spawning and rearing habitats are unlikely to be affected by the proposed project. Bull trout habitats that could be affected, therefore, are primarily foraging and migratory habitat.

The proposed project would result in the construction of mechanically stabilized earth (MSE) walls in proximity to Miller Creek. Failure of these walls could result in significant impacts to Miller Creek and the aquatic resources within the creek and the estuary due to filling the creek and wetlands, and increasing sediment loads. There have been concerns raised regarding the potential failure of the embankment. FAA has stated that the embankment has been properly engineered to avoid failures (FAA, pers. com. May 2001). The Corps will be evaluating the stability of the MSE wall. We also understand that an independent review is being conducted by the University of Washington on the stability of this wall (M. Walker, Corps, pers. com., 2001). Should their evaluation determine that there is a high and/or likely risk of failure, we will reevaluate our determination of the effects of the proposed MSE walls. We currently do not believe that failure of the MSE walls is reasonably foreseeable, and therefore the effects of its failure will not be further addressed in this BO.

There are potential long term and short term direct and indirect effects to bull trout from the proposed project. These impacts include a potential reduction of forage species, exposure of bull trout to contaminants through surface water and consumption of contaminated forage species, and physical effects due to sediment. However, due to proposed water quality measures during construction, potential water quality improvements over baseline conditions, minimal exposure to potential contaminants, and the very low likelihood for bull trout to be present during construction or in proximity to the affected areas, we believe that the proposed impacts are not likely to be significant, as discussed below.

To reduce water quality impacts related to construction of the proposed action, the BA states that the Washington Department of Ecology standard best management practices are to be implemented (Table 6).

Table 6. Summary of the Ecology Manual BMPs generally applicable to Master Plan construction sites.

Category	Applicable BMPs
Temporary cover practices	Temporary seeding, straw mulch, bonded fiber matrices, and clear plastic covering
Permanent cover practices	Preserving natural vegetation, buffer zones, permanent seeding and planting
Structural erosion control BMPs	Stabilized construction entrance, tire wash, construction road, stabilization, dust control, interceptor dike and swale, and check dams
Sediment retention	Filter fence, storm drain inlet protection, and sedimentation basins

In addition to the above measures, the BA also commits to the following:

- MPU projects will meet the turbidity standard for Class AA waters. This standard states that turbidity may not increase more than 5 Nephelometric Turbidity Units (NTU) over background when background is 50 NTU or less, or register more than 10 percent increase in turbidity when background exceeds 50 NTU.

- Implementation of advanced BMPs, as needed, including polymer stormwater batch treatment system or high-volume mechanical filtering devices.

Stormwater quality and hydrology mitigation implemented as part of the Sea-Tac MPU projects is proposed to improve water quality and hydrologic conditions in Miller and Des Moines creeks. Improved conditions may occur due to:

- Improved stormwater quality and quantity treatment of runoff from new development compared to the existing baseline,

- Retrofitting of existing airport facilities to upgrade water quality and quantity treatment of runoff to King County standards,

- Implementation of improved Ecology BMPs for construction and operation, and

- Mitigation activities in Miller and Des Moines creeks to improve instream habitat for fish and invertebrates.

Standard sediment and erosion control practices to minimize sedimentation may result in other potential water quality impacts including solar heating of the stored runoff which could affect stream temperatures when water is finally discharged. Temperature effects from retained

construction stormwater are unlikely because significant storms that would result in several days of water storage during warm weather are rare.

Some MPU project elements include in-water construction (e.g., Miller Creek Relocation, Vacca Farm restoration, 154th Street bridge replacement, and culvert replacement on the Tyee Golf Course) that could cause a direct increase of sediments to Miller and Des Moines creeks.

Degradation of the natural bank and stream will occur due to relocating and dewatering approximately 980 ft of the existing Miller Creek channel, and habitat enhancement activities. Some increased turbidity is likely to occur due to construction activities in-stream and along the banks. Construction elements for the stream relocation and the floodplain expansion occur concurrently, and are expected to occur during the driest time of the year, taking approximately 15 weeks, beginning in late June and ending by early October.

De-watering of Miller Creek within the project area will impact invertebrates inhabiting the substrate. These organisms could represent a potential food source for bull trout, but are primarily a food source for their forage fish. As the channel will only be dewatered for approximately 2 weeks and nearby sources of invertebrates are likely to recolonize the affected area following re-establishment of stream flows, the impact to bull trout is likely to be minimal.

Downstream of the floodplain and buffer enhancement areas at the Vacca Farm site, a 100-ft buffer will be established along the west side of approximately 6,500 linear ft of Miller Creek (within the acquisition area). Buffer averaging will be used on the east side of the creek, where a minimum 50-ft buffer will be established. Where the embankment design allows, buffers will be increased so that the average buffer width is 100 ft. A 100-ft buffer is also proposed on the West Branch of Des Moines Creek. The buffer enhancement should improve creek habitat over existing conditions. However, a 100-ft. buffer may not fully protect the aquatic resources. A 100-ft buffer may not adequately provide for sources of large woody debris. Large wood delivery into streams lessens at distances greater than one site potential tree height (FEMAT 1993). On the west side of the Cascades, one site potential tree height equates to approximately 150 ft.

Foraging bull trout are likely to be found in close association with their forage species. A sandlance spawning area is known from less than one mile north of the Miller Creek estuary. Surf smelt spawning areas are identified approximately one mile north and south of the Des Moines Creek estuary (WDFW 2000). Miller and Des Moines Creek estuaries may be used primarily as migration corridors for bull trout, with occasional foraging occurring on salmonids produced in these creeks. Since we believe that their primary forage base is not found within the Miller and Des Moines Creek estuaries, bull trout are unlikely to use these areas for extended periods of time. Therefore, their exposure to any potential increased sediment or contaminants which may enter the Miller or Des Moines Creek estuaries, or consumption of forage species which may have accumulated any contaminants from discharges associated with the proposed project, are reduced and likely insignificant.

Construction activities at the Auburn mitigation site could result in increased sediment inputs to the Green River. Prior to construction, the Auburn mitigation site will be dewatered. The pumped water will be discharge to the Green River about 1 mile north of the site via an existing drainage channel and outfall at South 277th Street. Dewatering will occur from approximately May 2001 through September 2001 for one or two seasons. The volume of dewatering water will be very small (2-8 cfs) compared to typical Green River flows (250-2000 cfs that occur during months when the system will operate), and therefore, unmeasurable and insignificant changes to river flows are expected. The existing farm drainage ditch between the site and South 277th Street will later be enlarged to create the outlet channel for the wetland. Discharged water will meet state water quality standards, and include pre-discharge treatment for sediment removal if necessary. Following dewatering, the mitigation site will be excavated and planted.

Pumped ground water may contain some sediments, but levels are not expected to be high. During excavation and until vegetation has formed adequate cover, turbid water may leave the site via the drain system, which eventually enters the Green River. Due to the proposed water quality controls and low levels of sediment which may be discharged, the distance from the project site to where the flows enter the Green River (thus allowing for some settling of sediments), and low likelihood for bull trout to be present near the existing outfall of the Green River, impacts to bull trout are expected to be insignificant.

During flood events, the Green River will back water into drainage channels and the wetland mitigation site (events greater than the approximate 10-year flood). The existing flap-gated culvert on the Green River, in its existing condition, may allow bull trout to access the drainage channel, where stranding may be possible. However, there is a low probability that bull trout access the drainage ditch through the drainage pipe. If bull trout do access the ditch, it is not anticipated that they would swim upstream to the mitigation site due to the lack of favorable conditions in the ditch and the minimal numbers of forage species present.

As bull trout are unlikely to be found within Miller, Walker, Des Moines, and Gilliam Creeks, as previously discussed, direct effects to this species in these waterways are unlikely. Indirect impacts may result due to impacts to bull trout forage species within these water bodies due to changes in flow, sediment discharges and chemical toxicity. However, based on the minimization measures proposed, these effects are likely to be minimal.

Indirect impacts caused by increases in impervious surfaces within a basin can increase the peak flows (duration and frequency) in receiving streams because the conversion to impervious surface speeds runoff and decreases infiltration and evapotranspiration (May *et al.* 1997). When a watershed's natural runoff cycle is modified by stormwater runoff, abnormal high flows increase erosion and destabilize channels during the wet season, and low summer flows are diminished due to lack of groundwater recharge. This limits fish populations by a number of interrelated mechanisms (Scott *et al.* 1986; Weaver *et al.* 1994; Whiles *et al.* 1995).

The proposed project will result in an increase of impervious surfaces as follows: approximately

106 acres (net) in Miller Creek watershed; approximately 6 acres in Walker Creek watershed; and approximately 128 acres in Des Moines Creek watershed. No increase in impervious surfaces is proposed for the Gilliam Creek watershed.

To minimize impacts from increases in impervious surfaces within these watersheds, stormwater management actions are proposed to reduce and minimize peak flows. Detention facilities will be sized to meet King County Level 2 flow control standards. These standards require that the flow duration of post-developed runoff match the pre-developed flow duration for all flow magnitudes between 50 percent of the 2-year flow event and the 50-year flow event.

The proposed project may result in reduced baseflows within Miller and Des Moines Creeks. Existing baseflows in Miller and Des Moines Creeks are approximately 1.8 cfs and 2.4 cfs, respectively. A reduction of approximately 4 percent (0.07 cfs) in Miller Creek baseflows and 7 percent (0.17 cfs) in Des Moines Creek baseflows was projected by Pacific Groundwater Group (2000). For Miller Creek, this equates to a reduction of approximately 1/8 inch to 1/4 inch in depth. In Miller Creek, there may be lower winter flows, but higher summer flows as a result of the potential for more groundwater infiltration with the project than currently exists. No information is available in the change in depth for Des Moines Creek. Additional streamflow analyses were conducted by Earth Tech, Inc. (2000) which also predicted reduced streamflows for both Des Moines and Miller Creeks during the low flow periods of August and September. Stream flows for Walker Creek were predicted to increase during August and September, 0.008 cfs and 0.010 cfs, respectively, as a result of pervious fill recharge and secondary impervious recharge. No net change in 7-day/2-year low flow is anticipated for Walker Creek. For the 7-day duration/2-year frequency stream discharge, a deficit of 0.10 cfs for Miller Creek at the SR 509 crossing and 0.08 cfs for Des Moines Creek were predicted. The reduction in baseflow may affect forage fish species. To minimize these impacts, reserved stormwater releases are proposed to be provided to Miller and Des Moines Creeks to off-set these reduced flows. The stormwater needs are calculated as 8.9 acre-feet for Miller Creek and 7.1 acre-feet for Des Moines Creek. The stormwater would be released at a prescribed rate, aerated, and discharged to the stream. Augmentation of baseflow in Des Moines Creek is also proposed using an existing Port owned well on the Tyee Golf Course. However, there are unresolved water rights issues with use of this well; therefore, other augmentation measures are being investigated. The well currently draws water from two zones. The Des Moines Creek Basin Plan includes inserting a casing and "packing off" the upper zone to eliminate potential wetland impacts resulting from well pumping. The Des Moines Creek Basin Committee would be responsible for implementing the use of the well for baseflow augmentation. Please see Table 7 for a summary of potential low flow changes.

Table 7. Summary of Des Moines, Miller and Walker Creek Streamflow Effects[1].

Creek		HSPF Model Stream Flow (cfs) 1994	1996	Predicted 2006 Conditions (cfs)[2]	Net Change from 1994 Conditions (cfs)
Des Moines	August	1.08	1.07	1.15	+0.07
	Sept	1.64	1.73	1.81	+0.17
	Aug./Sept	1.36	1.40	1.48	+0.12
	7-day/2-year low flow	0.35	0.27	0.35	0
Miller	August	1.27	1.10	1.31	+0.04
	Sept	1.50	1.40	1.55	+0.05
	Aug/Sept	1.39	1.25	1.43	+0.04
	7-day/2-year low flow	0.79	0.64	0.79	0
Walker	August	0.033	0.031	0.041	+0.008
	Sept	0.035	0.039	0.045	+0.010
	Aug/Sept	0.034	0.035	0.043	+0.009
	7-day/2-year low flow	0.021	0.015	0.021	0

[1] Based on Earth Tech, Inc. (2000).

[2] Flows based on the sum of 2006 HSPF streamflow, fill pervious recharge, non-hydrologic changes, secondary impervious recharge, and reserved stormwater release, as appropriate.

With the successful implementation of the proposed mitigation within the Miller and Des Moines Creek watersheds, the proposed action may benefit fish species due to improved riparian and instream conditions. The removal of structures near the stream channel, elimination of water withdrawals within the action area of Miller Creek, reduced turbidity, increased riparian vegetation, and augmented summer flows in Des Moines Creek should result in improved instream conditions in the long term for bull trout prey species. It is expected that baseline

production for salmonids should be maintained or improved with successful implementation of the proposed mitigation as described in the BA and supporting documents. Even if the projected streamflows are not achieved, and potential forage species for bull trout are impacted (i.e., reduced spawning grounds, reduced survival due to increased temperatures, increased stranding, reduced flows, dewatering, and/or a reduction in invertebrate forage), we do not anticipate these levels to be reduced to such an extent as to significantly impact this listed species. Potential forage fish currently produced in Miller, Des Moines, and Walker creeks are believed to represent an insignificant portion of the available forage base for bull trout in Puget Sound.

There is a potential for contaminated leachate to enter Miller Creek from the embankment fill, as well as for terrestrial organisms to expose and possibly bioaccumulate toxic materials that are contained in the fill material. Exposure of bull trout, bald eagles and marbled murrelets could potential result in impacts to these species. Some fill materials which have been accepted for use as part of the proposed action are known to contain DDT, PCBs, PAHs, and mercury (Table 8).

Table 8. Detected contaminants in fill material for the Sea-Tac MPUI.

Contaminant	Maximum Level Detected (USCOE[1])	Maximum Level Detected (Boeing[2])
Total DDT	14 parts per billion (ppb)	no detection
Total PCB	160 ppb	no detection
PAHs (Carcinogenic)	no detection	459 ppb
Mercury	0.074 parts per million (ppm)	0.51 ppm

[1] Corps detections, Hamm Creek Restoration Site, sampled June 16 and 17, 1997.

[2] Boeing detections, Hamm Creek Restoration Site, sampled April 17 and 18, 1990.

The Port is accepting fill material which generally meets the Model Toxics Control Act (MTCA) Method A contaminant levels. The Port may determine that specific material that does not satisfy MTCA Method A contaminant levels is appropriate for placement in a specific project location and will consult with the Washington Department of Ecology (WDOE) for approval prior to placement. Material that is obtained from state-certified commercial borrow pits is generally accepted for airport airfield projects without source-specific environmental certification. State certified materials are those that the Washington Department of Transportation has found to have geotechnically suitable material. The Washington Department of Transportation testing does not include testing for contaminants. Over 50 percent of the soil that the Port has placed to date has been from large pits. Most of these pits are state-certified and do not have historical sources of contamination. To date, all fill material accepted by the Port

has met the requirements of the Port/WDOE 1999 airfield project soil fill acceptance criteria, which includes the Method A standards for MTCA.

Limited information is available regarding effects of contaminants on bull trout. The lake trout, *S. namaycush,* a closely related species to bull trout, is the most sensitive species known for early life stage mortality associated with exposure of embryos to tetrachlorodibenzo-dioxin and related compounds. However, Cook et al. (1999) looked at the effects of 2, 3, 7, 8-Tetrachlorodibenzo-p-dioxin (TCDD) and polychlorinated biphenyl (PCB) 126 on early life stages of bull trout. Preliminary data indicated that bull trout are approximately three times more sensitive to TCDD than lake trout.

To ensure that leachate from the embankment fill does not result in contamination of aquatic resources in and adjacent to Miller Creek, and to reduce the risk to terrestrial organisms, the Port has agreed to the following measures, which are summarized below (see Enclosures 1 and 2 for the complete text):

1. No soil will be accepted that exceeds MTCA Method A standards for Resource Conservation and Recovery Act (RCRA) metals (Table 9) or organochlorines. If the Port considers placement of fill material that does not meet MTCA Method A Standards, the Port will discuss the results with the Service and reinitiate consultation, as appropriate. To mitigate stormwater runoff impacts on Miller and Des Moines creeks, the flow control standards adopted by the Port will comply with the approved MPU FEIS (FAA 1996), the Governors Certificate (Locke 1997), the King County Surface Water Design Manual (King County DNR 1998), and the Ecology Manual. The drainage layer cover (that layer immediately above the drainage layer of the embankment) will be composed of "ultra-clean" fill (as described below). It will measure at least 40 ft thick at the face of the embankment and will reduce in height to the east at a rate of 2 percent.

2. No soil will be accepted for the drainage layer cover that exceeds the back-calculated values in the second column of Table 9, unless the Synthetic Precipitation Leaching Procedure (SPLP) confirms the suitability of the soil, as described in Appendix 1, Attachment A, 1(b)(iv). The Port will consult with the FWS if site-specific data is collected which may merit a recalculation of the three phase model soil concentrations in Table 5, and reinitiate consultation, as appropriate.

3. If soil in the drainage cover layer exceeds background concentrations of metals, as stated in column 6 of Table 9, SPLP testing will be conducted to demonstrate that MTCA Method A criteria are protective of the baseline conditions for surface water receptors.

4. The Port will require testing for organochlorines where such compounds may be present.

5. Soils found to contain organochlorines at concentrations below Three Phase Partitioning Model concentrations (adjusted for PQLs) will be deemed acceptable. No soil will be

accepted for the drainage layer cover that exceeds Three Phase Partitioning Model concentrations unless SPLP testing confirms the suitability of the soil.

6. The surficial three feet of fill will be screened to not exceed the Proposed Ecological Standard or MTCA Method A, which ever is less.

7. The Port shall develop a plan to monitor the quality of seepage from the drainage layer beneath the embankment fill. Should monitoring detect adverse impacts to aquatic life in the project area, the Port shall reinitiate consultation as appropriate and implement measures to address such impacts.

Table 9. Soil Screening Criteria for the SeaTac Embankment Fill (milligram/kilogram (mg/kg)) (adapted from J. Lynch, Stoel Rives, pers. com. 2001).

RCRA [1] Metals	Three Phase Partioning Model Concentrations[2]	MTCA [3] Unrestricted Land Use			Puget Sound Background (upper 90 percent) [5]	Screening Criteria	
		Current Method A Standard	Proposed Method A Standard [4]	Proposed Ecological Standard [4]		Drainage Layer Cover	Top 3-feet of Embankment
Arsenic	88	20	20	95 (As V)	7	7 - 20 [6]	20 [7]
Barium	12,000	NA [8]	NA	1,250	NA	12,000 [9]	1,250 [10]
Cadmium	0.15	2	2	25	1	1 - 2 [11]	2 [7]
Chromium (total)	NA	100	NA	42	48	48 - 100 [11, 12]	48 [13]
Lead	500	250	250	220	24	24 - 250 [14]	220 [10]
Mercury (inorganic)	0.013	1	2	9	0.07	0.07 - 2 [11]	2 [7]
Selenium	0.52	NA	NA	0.8	NA	5 (PQL [15]) [16, 17]	5 (PQL) [16]
Silver	0.11	NA	NA	NA	NA	5 (PQL [15]) [16, 17]	5 (PQL) [16]

1 RCRA: Resource, Conservation and Recovery Act

2 MTCA WAC 173-340 747 (3), (4), and (5) Three Phase Partitioning Model soil concentrations calculated using aquatic freshwater quality criteria (WAC 173-201A). For purposes of this table, the lowest criteria from "Freshwater CCC Chronic" Screening Quick Reference Table (NOAA SQuiRT Table) were used.

3 MTCA: Model Toxics Control Act, Washington Administrative Code (WAC) 173-340.

[4] Proposed MTCA Method A and Ecological standards were finalized on February 15, 2001, and will become effective on August 15, 2001.

[5] Natural Background Soil Metals in Washington State (Ecology Publication 94-115).

[6] The MTCA Method A standard of 20 mg/kg is less than the Three Phase Partitioning Model concentration of 88 mg/kg indicating that the MCTA Method A standard is protective of surface water receptors. When soil concentrations are greater than background but below the MCTA Method A standard, sufficient SPLP testing will be conducted to confirm that the MCTA Method A standard is protective (see associated text in Attachment A for discussion of SPLP testing).

[7] Screening criteria based on MTCA Method A standards.

[8] NA: not available. Insufficient information available to develop the criteria.

[9] Three Phase Partitioning Model concentrations calculated using MTCA Method B ground water quality criteria because there was no available criteria for barium in surface water. If concentrations exceed calculated values, SPLP testing will be required to evaluate the suitability of the soil.

[10] Screening criteria based on ecological standards.

[11] Three Phase Partitioning Model concentrations, adjusted upward to background, and MTCA Method A standards. To verify the protectiveness of MCTA Method A standards, SPLP testing will be conducted when soil concentrations exceed background but are below MCTA Method A standards. (Note: exceedances in background concentrations anticipated due to natural variability of soil types being used as fill.)

[12] Chromium speciation may be conducted in the event SPLP is applied.

[13] Screening criteria based on ecological standards, adjusted for background.

[14] The MTCA Method A standard of 250 mg/kg is less than the Three Phase Partitioning Model concentration of 500 mg/kg indicating that the MTCA Method A standard is protective of surface water receptors. When soil concentrations are greater than background but below the MTCA Method A standard, sufficient SPLP testing will be conducted to confirm that the MCTA Method A standard is protective.

[15] PQL: Practical Quantification Limit

[16] PQLS from Department of Ecology "Implementation Memo No. 3: PQLs as Cleanup Standards," November 24, 1993.

[17] Three Phase Partitioning Model concentrations, adjusted upward to PQL. If soil concentrations exceed the PQL, SPLP testing will be required to evaluate the suitability of the soil.

In addition to these measures, the exposure to terrestrial organisms is further reduced as portions of the embankment are paved, and therefore, species cannot come into contact with fill material. Also, the Port actively manages the airport to dissuade the use of terrestrial organisms due to potential aircraft safety issues. Although some wildlife, such as small birds and rodents, may use and feed in areas of embankment fill, the numbers are expected to be low. It is anticipated that organisms which may utilize the embankment would provide a minor food source for bald eagles and there would be a low risk of bioaccumulation occurring should this listed species feed on these organisms.

Des Moines Creek and Miller Creek, and discharges from the IWS may currently exceed sub-lethal toxicity levels for bull trout and their forage species for Cu based on values available for other fish species (Eisler 1998) (Table 2). No specific information on Cu toxicity is available for bull trout.

IWS discharge rates will increase as a result of the proposed action. The plume from the IWS outfall diffuser is located at a depth of 156 ft to178 ft, 1,800 feet off shore in Puget Sound, and could raise baseline levels above ambient within 65 meters (213.2 ft) of the outfall. Bull trout could occur within this zone. Bull trout may also occur at the mouths of Des Moines and Miller Creeks. However, bull trout are unlikely to be exposed for long periods of time to chronic toxicity levels. Bull trout are opportunistic feeders, and their presence within an area of the marine environment is based largely on the forage base present. Cu is known to interact with many compounds in water. The amount of Cu compounds and complexes in solutions depends on many factors, including water pH, temperature, and alkalinity, as well as the concentrations of bicarbonate, sulfide, and organic ligands (USEPA 1980 *in* USGS 1998). The toxicity of Cu will depend on the interactions it has with other compounds. For example, mixtures of Cu and Zn salts are more-than-additive in toxicity in the marine and freshwater environment (Eisler and Garner 1973 *in* USGS 1998, Birge and Black 1979 *in* USGS 1998, Hodson et al. 1979 *in* USGS 1998). However, sequestering agents, increasing salinity, sediments and other variables reduce the toxicity of Cu in invertebrates and aquatic plants that have been tested (USGS 1998). Mortality from Cu to bony-fish is reduced in waters with high concentrations of organic sequestering agents (Hodson et al. 1979 *in* Eisler 1998). In rainbow trout, high salinities resulted in lower Cu toxicity (Wilson and Taylor 1993 *in* Eisler 1998).

The proposed project may result in a minor increase or possibly a reduction of Cu over existing levels due to the proposed conversion of land use from residential to open space and runway and taxiways, based on information provided in the BA and additional information provided by the consultants (Table 10).

Table 10. Estimation of Cu concentration change for Sea-Tac.[1]

	Runway/Taxiway	Residential	Commercial	Open-Space	Total Cu µg/L
Cu µg/L (median)	26	20	32	10	
Existing Conditions (acres)	149.2	373.7	0	0	
Existing Conditions (acres * Cu µg/L)	3,879	7,474	0	0	11,353
With Project (acres)	343.5	0	7.3	172.1	
With Project (acres * Cu µg/L)	8,931	0	234	1,721	10,886

[1] Based on information provided by Parametrix, from J. Lynch dated April 20, 2001.

The BA states that the median level of Cu from the runway and taxiway areas is 37 µg/L. This value has been updated based on two years of additional water quality data, and is currently calculated as 26 µg/L of Cu. Data for residential areas was assumed by the consultants to be similar to the data available for King County Metro of 20 µg/L. It was also assumed that any open space areas converted from residential would have a lower Cu value. Ten µg/L was estimated as the value for open-space based on the consultant's best professional judgement.

The Cu values cited for residential areas may not represent the Cu values currently discharged from the residential areas in the project area as the data used is a composite from King County rather than site specific information. Additionally, some of the residential area is misclassified. For example, Vacca Farms should be classified as agricultural lands, which may have a different Cu value from that presented. Therefore, the above values do not accurately predict existing or future conditions for Cu. However, we believe it is likely that lands that will be taken out of residential use and converted to open-space should result in a reduction of Cu being generated for this land use type. Taking into account the revised Cu discharges levels from Sea-Tac and the conversion of residential areas to open-space lands which should result in less Cu being generated over existing levels, we believe that the predicted Cu discharges are not likely to increase significantly over baseline values and may, in fact, be reduced.

Therefore, due to the relatively low production of forage fish in Miller and Des Moines Creeks,

and the low forage base level near the outfall, limited exposure of bull trout to potential chronic toxicity levels, and potentially minor increase or decrease of Cu over existing conditions, affects from Cu are likely to be minimal compared to baseline conditions.

Zn levels within Des Moines and Miller Creek estuaries, and discharges from the IWS (Table 2) currently exceed acute toxicity levels for bull trout based on studies conducted by Stratus Consulting, Inc. (1999). Acute toxicity analyses were performed for bull trout with regard to Zn and cadmium (Cd) (Stratus Consulting, Inc. 1999). Bull trout had a lethal concentration for fifty percent of the test animals (LC_{50}s) ranging from 31.9 µg to 86.9 µg Zn/L, with an average value of 54 µg Zn/L. Higher hardness and lower pH water produced lower toxicity of Zn and Cd in bull trout, but higher water temperature increased their sensitivity to Zn. Several trends have been noted regarding the affects of Zn on fish: 1) freshwater fish are more sensitive to Zn than marine species; 2) embryos and larvae are the most sensitive developmental stages; 3) effects are lethal or sublethal for most species in the range 50-235 µg Zn/L and at 4.9-9.8 µg Zn/L for the brown trout specifically; and 4) behavioral modifications, such as avoidance, occur at concentrations as low as 5.6 µg Zn/L (Eilser 1993). Impacts to reproduction may be one of the more sensitive indicators of Zn stress in freshwater teleosts, with effects evident in the 50-340 µg Zn/L range (Spear 1981 *in* Eisler 1993).

The toxicity of Zn to aquatic organisms depends on the physical and chemical forms, the toxicity of each form, and the degree of interconversion among the various forms (Eisler 1993). Suspended Zn has minimal effect on aquatic plants and fish, but many aquatic invertebrates and some fish may be adversely affected from ingesting enough Zn-containing particulates (EPA 1987 *in* Eisler 1993). Freshwater fish are affected by Zn toxicosis by destruction of gill epithelium and consequent tissue hypoxia. Osmoregulatory failure, acidosis and low oxygen tensions in arterial blood, and disrupted gas exchange at the gill surface and at internal tissue sites are all indicators of acute Zn toxicosis in freshwater fish (Spear 1981 *in* Eisler 1993). Zn may also affect fish immune systems (Ghanmi et al. 1989 *in* Eisler 1993). Additionally, combinations of Zn and Cu are generally more-than-additive in toxicity to a wide variety of aquatic organisms, including freshwater fish (Skidmore 1964 *in* Eisler 1993; Hilmy et al. 1987a *in* Eisler 1993) and marine fish (Eisler and Gardner 1973 *in* Eisler 1993; Eisler 1984 *in* Eisler 1993).

There are a number of factors which are known to modify the biocidal properties of Zn in aquatic environment. Zn tends to be more toxic to embryos and juveniles than to adult, to starved animals, at elevated temperatures, in the presence of Cd and mercury, in the absence of a chelating agent, at reduced salinities, under conditions of marked oscillations in ambient Zn concentrations, at decreased water hardness and alkalinity, and at low dissolved oxygen concentrations (Skidmore 1964 *in* Eisler 1993; Weatherley et al. 1980 *in* Eisler 1993; Spear 1981 *in* Eisler 1993; EPA 1987 *in* Eisler 1993; Paulauskis and Winner 1988 *in* Eisler 1993).

Although the existing levels of Zn typically exceed those levels detected to have an acute effect on bull trout, the toxicity values are based on 96 and 120 hours of exposure. It is unlikely that bull trout will remain in proximity to the mouths of Des Moines and Miller Creeks, or in the vicinity of the IWS outfall for this length of time. Chronic toxicity levels of Zn were not tested and are not known for bull trout. Chronic toxicity levels would be expected to be lower than acute levels.

Again, bull trout exposure at these sites to acute or chronic levels is expected to be minor due to the low likelihood of their feeding or occupying these areas for a significant length of time. Additionally, Zn levels may be reduced from existing levels due to the conversion of residential land use to airport runway and taxiway areas based on information provided in the BA as well as from the Washington Department of Ecology NPDES permit for Sea-Tac (WDOE 1998). The predicted levels of Zn may affect other fish or invertebrate species which occupy these water bodies. For example, the LC_{50} values listed in the BA for chinook salmon (446 µg/L) and brook trout (2,100 µg/L) are higher than those found by Stratus Consulting, Inc. (1999) for rainbow trout (27.3 µg/L to 447 µg/L). Therefore, although the data indicates that acute toxicity standards may not be exceeded for some species, prey species for bull trout and their forage fish may be affected by the levels of Zn occurring in these waters. However, we believe that the effects of Zn to bull trout as a result of the proposed project are likely to be minimal compared to existing baseline conditions.

Additionally, the proposed action includes improved stormwater treatment over existing conditions. Currently, approximately 166.2 acres of the 479.1 acres of pollutant generating impervious surface (PGIS) (the area requiring water quality treatment best management practices) are untreated. With the proposed project, approximately 80 acres will remain untreated due to proposed retrofitting of existing facilities or conversion from a PGIS to a non-PGIS status (approximately 7.3 acres). This increased treatment of stormwater includes source controls and additional best management practices, including wet vaults and bioswales. Based on the increased stormwater treatment over existing conditions, even with the new development which will also be fully treated, there is a potential improvement over existing water quality conditions.

The Port has committed to removing Tempo and Diuron from the list of allowable chemicals currently included for use on the airport (K. Smith, Port of Seattle, pers. com., 2001). The other pesticides and herbicides do to not pose as great a risk to aquatic species as do Tempo and Diuron (Meister 1995). In addition to the chemicals already included for use on Sea-Tac, the BA proposes to use 2,4-D amine and Garlon in the Green River mitigation area. No use of herbicides is proposed within other mitigation areas. Due to limited exposure bull trout would have to these chemicals, the effects are likely to be minimal.

Advanced stormwater treatment systems that use flocculation agents could potentially add chemicals to stormwater runoff. The potential water quality impacts from the advanced stormwater treatment BMPs used to control turbidity include changes to pH and the toxicity of treatment compounds. The draft Ecology Stormwater Manual Update includes a BMP for Construction Stormwater Chemical Treatment (Ecology 1999b). For its treatment regimes, the Port has used both organic polymers, such as CatFloc, and inorganic compounds such as alum. The use of cationic PAMs may result in impacts to forage fish and bull trout. However, due to the potential for buffering of treated water from sediments and the limited exposure bull trout may have to this chemical, the effects are likely to be minimal.

Bald Eagle

The proposed action is unlikely to result in significant impacts to bald eagles. Impacts are

expected to be minor since no bald eagle nesting territories occur within the action area and no potential nest trees will be removed. If permits to construct the third runway are obtained, the fill currently elevating the embankment 50 ft above the airport ground would be leveled and no longer serve as a perching area for bald eagles. Although trees within the MPUI are proposed to be removed, there is a low likelihood that th are used for perching due to the small forage base in Des Moines and Miller Creeks. Also, due to the high amount of noise generated by the airport, bald eagles are less likely to frequent this area in high numbers. Bald eagles may use the Tyee Golf Course area to forage for waterfowl. There is likely to be a reduction in waterfowl use of this area due to its conversion to scrub-shrub wetlands and airport facilities. This could result in a reduction in bald eagle foraging in this area over baseline conditions, should it currently occur. However, due to the existing human use and disturbance of this area, loss of this area as a possible foraging base is not expected to be significant to bald eagles. Additionally, since no additional habitat is provided by the proposed airport facilities, flight paths of bald eagles over the airport are not anticipated to increase due to the proposed project.
Runway 34R, which is the runway closest to Angle Lake, will be extended by 600 ft. It is estimated that larger planes will use the additional runway extension several times a year over existing conditions (E. Levitt, Port of Seattle, pers. com., 2001). Bald eagles flying from the nest site are likely to be at a lower flight elevation than planes that may be landing. Although there is a risk of collisions of bald eagles with airplanes due to the extension of this runway, the risk is anticipated to be minimal due to the few additional flights which will use this part of the runway over existing conditions. Additionally, most bald eagles are likely to be below 1000 ft. when planes are taking off from the airport, thus avoiding being struck by a plane.

No air strikes of bald eagles have been documented at Sea-Tac. There are a number of "unidentified" species that were struck by aircraft at Sea-Tac between 1991 and 1997. Of this total of 53 birds, 19 were small, 1 was large, and 33 were unknown (FAA 1999). Bald eagles have been identified in bird strikes by civil aircraft in the United States (FAA 1999). In a national report on bird strikes, out of a total of 22,320 bird strikes reported between 1990 and 1998, 20 were bald eagles and 32 were unidentified hawks, kites, and eagles. At least an additional 7 bald eagle strikes have occurred since 1998 (S. Wright, unpublished data). None of the eagle strikes reported were in Washington. The majority of the eagle strikes occurred in Alaska. Bird strike information is not required to be reported to FAA, and it is estimated that only about 20 percent of the bird strikes are reported, therefore the number of strikes is likely to be an underestimate (FAA 1999). Most bird strikes (53 percent) result during takeoff and climbing. Over 55 percent occurred within 99 ft above ground level and approximately 87 percent occurred within 2,000 ft above ground level (FAA 1999). Although bald eagles may be at risk of airplane strikes, the risk can be very low. Only one unconfirmed bald eagle strike in 1989 has been documented for Whidbey Island Naval Air Station, a site which is on Puget Sound north of the proposed project site and has daily use by bald eagles (M. Klop, Whidbey Island Naval Air Station, pers. com., 2001). Due to the large size of the bald eagle, should an air strike have occurred at Sea-Tac, it would be assumed that the bird would have been identified prior to contact or some body parts, including feathers, would still be identifiable. Even though reports of bird strikes are not required by FAA, Sea-Tac twice daily performs runways searches which would likely find signs of wildlife strikes should they occur. No bald eagles have been reported as a result of these searches.

Therefore, although there is a risk of an air strike of a bald eagle at Sea-Tac, we do not believe that this risk is significantly increased as a result of the proposed action

Concerns have been raised that air strikes of bald eagles might occur as this species may use thermals produced by the proposed retaining wall. It is unlikely that bald eagles would utilize th area near the retaining wall due to the lack of forage. Additionally, bald eagles primarily hunt from perches as opposed to soaring. Therefore, the risk of airplane strikes of bald eagles from their use of thermals is expected to be minimal.

The proposed on-site and off-site mitigation for the project could have some minor long term benefit for the bald eagle should it be successful. The proposed improvements to Miller and Des Moines Creeks may improve the forage base for bald eagles. However, bald eagles are not likely to forage in the upper watersheds. The creeks are relatively narrow with some canopy, limiting the ability of bald eagles to forage effectively. The proposed off-site mitigation may also have a beneficial effect on bald eagles, should it be successful, due to the potential to enhance waterfowl habitat, as waterfowl are prey for the bald eagle. However, depending on the amount of future disturbance due to increased development in the vicinity of the Auburn mitigation site, use of the site by foraging bald eagles may be minimal.

Marbled Murrelet

The proposed project is likely to result in insignificant impacts to marbled murrelets. Suitable marbled murrelet nesting habitat does not occur within the action area, including the off-site mitigation area. The nearest potential habitat to the east of the action area is approximately 32 miles away. The nearest known occupied site is approximately 36 miles away. Potential foraging habitat is present at the mouths of Miller Creek and Des Moines Creek, and within Puget Sound. Although the proposed project may result in some short term impacts to potential prey species (i.e., salmonids) that occur within Miller and Des Moines Creeks, salmonids are not known to form the primary diet of marbled murrelets. Thus, the effect to marbled murrelets from any impacts to the salmonid prey base would be minimal. There is a potential for a long term benefit to marbled murrelets should the proposed mitigation successfully enhance fish habitat and result in increased fish production within these creeks. However, as stated above, this benefit is likely to be minor as salmonids do not form the primary diet of the marbled murrelet.

Impacts from air strikes are unlikely. No air strikes have been documented for marbled murrelets at Sea-Tac. Although there are a number of "unidentified" species which have been struck by airplanes, the likelihood of aircraft striking marbled murrelets is considered insignificant. This conclusion is based on: 1) no alcids have been identified in any reported wildlife strikes to civil aircraft in the United States between 1990 and 1998 (FAA 1999); 2) marbled murrelets typically fly at altitudes greater than 2,770 ft (1,000 meters) in altitude when leaving the ocean to nesting habitat (Burger 1997) and most air strikes are within 900 ft above ground level (FAA 1999); and 3) marbled murrelets are fast fliers and can move quickly to avoid collisions, while the majority of bird strikes involve slower flying birds. Additionally, due to the rarity of marbled murrelets, few are likely to fly over Sea-Tac, therefore the risk of air strikes is reduced. Despite the numerous surveys which have occurred within this area, there have only been nine marbled murrelet

detections (four occupied sites and five detections only) east of Sea-Tac whose flight path might cross the airport. The majority of marbled murrelet sightings and detections for nesting and foraging are north and south of the project area. Their travel paths are unlikely to cross the airport between nesting and foraging locations. Although this does not represent all marbled murrelets which might travel near Sea-Tac between Puget Sound and the Cascades, it does demonstrate the small population that has been found to date.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future state, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this Section because they require separate consultation pursuant to Section 7 of the Act.

Three broad categories of cumulative effects which may occur in the action area include: 1) growth and development; 2) forest management; and, 3) other management actions. Growth and development refer to permanent loss of suitable habitats. Growth and development actions include conversion of forest habitat to urban, other residential, commercial, or agricultural uses, and for structures or networks providing infrastructure support such as hydro power and irrigation diversions, roads, and power-lines. Forest management refers to temporal and spatial changes from other state or private actions in suitable habitats across the landscape in the action area. Examples include age or structural changes resulting from harvest and other forest-management actions such as planting, pruning, fertilizing, forest growth, and wildland fires. Other management actions refer to actions within suitable habitats which impact habitat structures or composition such as recreation, grazing, fishing, and mining. Each of these categories of impacts may result in the loss of secure habitat for species using suitable habitats within the action area. Examples of this include physical displacement, exposure to contaminants, and declining air and water quality. The proposed MPUI site may be developed further. Redevelopment of the borrow or acquisition areas may occur in the future. However, the Port states that they have no immediate plans to develop the sites. Proposed actions near the off-site wetland mitigation project in Auburn include a proposed trail along the Green River and development of private property to commercial and residential uses. Some of these proposals may have a federal nexus (i.e., ACOE Section 404 permits) associated with them. It is not known to what extent these proposals will be addressed by future consultations. These proposed actions could result in increased impervious surfaces with potential stormwater and water quality impacts, increased access and use (including fishing) within the Green River, and the reduction of restoration potential of the riparian buffer and input of large woody debris into the Green River.

CONCLUSION

After reviewing the current status of the bull trout, bald eagle, and marbled murrelet, the environmental baseline for the action area, the effects of the proposed MPUI, and the cumulative effects, it is the FWS's biological opinion that the MPUI, as proposed, is not likely to jeopardize the continued existence of the bull trout, bald eagle or marbled murrelet. We reached this conclusion on the basis that the proposed action is not likely to adversely affect these species, as

discussed in the Effects section of this opinion.

No critical habitat has been designated for the bull trout or bald eagle. Therefore, none will be affected for these species. Critical habitat has been designated for the marbled murrelet. However, the project does not occur within designated critical habitat, therefore none will be affected for this species.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and federal regulation pursuant to Section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the FWS to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the FWS as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of Section 7(b)(4) and Section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The FWS does not anticipate the proposed action will incidentally take bull trout, bald eagle or marbled murrelet. Therefore, no take exemption for the bull trout, bald eagle or marbled murrelet is provided.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

These are as follows:

1. The riparian buffers along Miller Creek and Des Moines Creek should be at least 150 ft on each side to better protect the aquatic environment, including cutthroat trout and coho salmon, which is a federal candidate for listing under the Act. This increased buffer width is critical in providing large woody debris and nutrients to the streams, as well as additional storm water benefits, should development occur immediately outside of the riparian buffers. Wider buffers also benefit wildlife species which use the riparian habitat for reproduction, foraging and resting by reducing the disturbance from human activities.

2. Monitor fish use, including spawning activities, in Miller and Des Moines Creeks to determine success of habitat enhancement and restoration activities.

3. Evaluate effects to invertebrates in the restored section of Miller Creek. Include changes in species composition from existing conditions, and recovery of the system following diversion of flows into the new channel.

4. Viable native plants shall be salvage and reused at mitigation sites.

5. Large diameter trees with attached rootwads or large rootwads that are to be removed as a result of the project should be retained/saved for future use on Port or other restoration/ mitigation sites in King County.

6. Large woody debris placed in Miller Creek should be keyed into the bank at a minimum 1 to 1 ratio (for every foot of wood instream, one foot should to be keyed into the bank). Root wads without boles should not be used. This will better insure the success that large woody debris placed for stream restoration will function as designed.

7. Pesticides and herbicides should not be used due to the potential to enter the groundwater and surface water where it may potentially affect the invertebrate forage base and fish species. Should their use be unavoidable, we recommend that a minimum 200 ft. buffer from waterbodies be required If a 200 ft buffer cannot be implemented, we recommend that a monitoring program be implemented to determine the adequacy of the 50 ft. buffer in protecting aquatic resources, including wetlands, from pesticide and herbicide contamination. Rodeo may be used if other non-chemical methods to control reed canary grass prove to be unsuccessful. If Garlon is used in the Green River mitigation area, it should be restricted to the use of Garlon 3a. Garlon 4 should not be used. Organophosphates, carbamates and triazine herbicides should not be used under any circumstance.

8. Reduce or eliminate airport sources of Cu and Zn. Implement additional best management practices to treat stormwater to levels of Cu and Zn below acute and chronic toxicity levels for aquatic organisms. Sufficient monitoring must be performed to determine that reduced levels are being achieved.

9. New structures should not contain pollution generating impervious surfaces.

10. Use anionic PAM products which have reduced toxicity on aquatic organisms compared to cationic PAM.

11. Evaluate the effectiveness of temporary erosion and sediment control measures.

12. Provide copies of monitoring reports to the Western Washington Office.

13. Conduct research to better define population status and use by bull trout of watersheds and marine areas where Port of Seattle and FAA activities occur.

For the FWS to be kept informed of actions minimizing or avoiding adverse affects or benefitting listed species or their habitats, we request notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation on the actions outlined in the request. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: 1) the amount or extent of incidental take is exceeded; 2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; 3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or 4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

The WDOE and the Corps have not completed their review of the project at this time; therefore, issuance of the NPDES permit, water quality certification (401), and Clean Water Act Section 404 permit have not occurred. The BA includes a number of best management practices which are proposed to meet state water quality standards. The BA acknowledges that additional measures may be necessary. The FWS, in our review of the effects of the proposed action, assumes that the criteria in the Washington State surface water quality standards will be met by the project at all times. Any future actions that may be taken to meet state surface water quality standards or Section 404 permit requirements need to be evaluated to determine if reinitiation of this consultation is necessary.

If you have any questions regarding this Biological Opinion, please contact Nancy Brennan-Dubbs, of my staff, at (360) 753-5835 or Jim Michaels, of my staff, at (360) 753-7767.

Sincerely,

Lynn P. Childers

for Ken S. Berg, Manager
Western Washington Office

c: Corps, Seattle (M. Walker)
NMFS, Seattle (T. Sibley)
WDOE. Bellevue (A. Kenny)
Port of Seattle, Sea-Tac (E. Levitt)

Enclosures

LITERATURE CITED

Airport Communities Coalition. 2001. An examination of issues related to the Port of Seattle's Proposed Third Runway at SeaTac International Airport. February 2001. Unpublished.

American Ornithologist's Union. 1983. Checklist of North American birds. 6th ed. American Ornithologists' Union, Baltimore, MD.

Anderson, B., J. Frost, K. McAllister, D. Pineo, and P. Crocker-Davis. 1986. Bald eagles in Washington. Washington Wildlife 36(4):13-20.

Anthony, R. G., and F. B. Isaacs. 1989. Characteristics of bald eagle nest sites in Oregon. J. Wildl. Manage. 53(1):148-159.

Anthony, R. G., R. L. Knight, G. T. Allen, B. R. McClelland, and J. I. Hodges. 1982. Habitat use by nesting and roosting bald eagles in the Pacific Northwest. Trans. N. Am. Wildl. Nat. Res. Conf. 47:332-342.

Beauchamp, D. 2000. Personal communication by e-mail. March 17, 2000. Univ. of Washington, Seattle, Washington.

Brown, L.G. 1992. On the zoogeography and life history of Washington native char: Dolly Varden (*Salvelinus malma*) and bull trout (*Salvelinus confluentus*). Report #94-04. Washington Department of Wildlife, Fisheries Management Division Report, Olympia, Washington.

Buckman, R. C., W. E. Hosford, and P. A. Dupee. 1992. Malheur River bull trout investigations. Pages 45-57 in P. J. Howell and D. V. Buchanan. Proceedings of the Gearhart Mountain bull trout workshop. Oregon Chapter of the American Fisheries Society. Corvalis, Oregon.

Burkett, E. 1995. Marbled murrelet food habits and prey ecology. Draft document prepared for the marbled murrelet Recovery Team, July 12, 1994. 47pps. *in* USFWS 1997.

Buchholz, F. L. 1992. Polyacrylamides and poly(acrylic acids). *in* Ullmann's encyclopedia of industrial chemistry, vol. A21. B. Elvers, S. Hawkins and G. Schulz (eds.) VCH, Weinheim, Germany (Federal Republic), pp. 143-156 *in* Sojka and Lentz (no date).

Burger, A. 1997. Behavior and numbers of marbled murrelets measure with radar. J. Field Ornithology 68(2): 208-223.

Cairns, D. K. 1992. Bridging the gap between ornithology and fisheries science: use of seabird data in stock assessment models. Condor 94:811-824 *in* USFWS 1997.

Carter, H. R. 1984. At-sea biology of the marbled murrelet (*Brachyramphus marmoratus*) in Barkley Sound, British Columbia. Masters of Science Thesis, Univ. of Manitoba, Winnipeg,

Manitoba.. 144pp. *in* USFWS 1997.

Carter, H. R. and R. A. Erickson. 1988. Population status and conservation problems of the marbled murrelet in California, 1892-1987. Final report, California Department of Fish and Game, Contract FG7569, Sacramento, California.

Carter, H. R. and R. A. Erickson. 1992. Status and conservation of the marbled murrelet in California, 1892-1987. *in* H. R. Carter and M. L. Morrison (eds). Status and conservation of the marbled murrelet in North America. Proc. West. Found. Vert. Zool. 5:92-108 *in* USFWS 1997.

Carter, H. R. and K. J. Kuletz. 1995. Mortality of marbled murrelets due to oil pollution in North America. Pages 261-269 *in* C. J. Ralph, G. L. Hunt, M. Raphael, and J. F. Piatt (Tech. eds). Ecology and conservation of the marbled murrelet. Gen. Tech. Rept. PSW-GTR-152. Albany, CA: Pacific Southwest Research Station, Forest Service, U. S. Dept. of Agriculture. 420pp. *in* USFWS 1997.

Carter, H. R. and S. G. Sealy. 1990. Daily foraging behavior of marbled murrelets. Pages 93-102 *in* S. G. Sealy (ed.) Auks at sea. Studies in Avian Biology 14 *in* USFWS 1997.

Castro, J. and F. Reckendorf. 1995. Effects of sediment on the aquatic environment. Potential NRCS actions to improve aquatic habitat. Working Paper No. 6. Natural Resources Conservation Service. Oregon State University, Corvallis, OR.

Cavender, T. M. 1978. Taxonomy and distribution of the bull trout, *Salvelinus confluentus* (Suckley), from the American Northwest. Calif. Fish and Game 64(3):139-174.

City of Tukwila. 2000. Gilliam Creek Basin: Description of existing conditions and alternatives for improvement. Prepared by Herrera Environmental Consultants, Inc. City of Tukwila, Public Works Department. February 18, 2000. 78pp.

Cleland, M. 2001. Personal communication, telephone, April 12, 2001. USDA, Wildlife Services.

Connor, E., D. Reiser, K. Binkley, D. Paige, and K. Lynch. 1997. Abundance and distribution of an unexploited bull trout population in the Cedar River Watershed, Washington. Pages 403-411 *in* MacKay, W., M. Brewin, and M. Monita, eds. 1997.

Cook, P. M., W. Fredenberg, M. Lawonn, I. K. Loeffler, E. Andreasen, and R. E. Peterson. 1999. Early life stage toxicity of 2, 3, 7,8-Tetrachlorodibenzo-p-dioxin (TCDD) and PCB 125 to bull trout. Abstract. Bull Tout II Conference, British Columbia, November 1999.

Craig, S. D. 1997. Habitat conditions affecting bull trout, *Salvelinus confluentus*, spawning areas within the Yakima River Basin, Washington. Central Washington University. Ellensburg, Washington. Master's Thesis. 74 pp.

Cropp, T., Washington Department of Wildlife (WDW), *in* 1993. Memos to Craig Burley, WDW, regarding bull trout/Dolly Varden in South Puget Sound river basins (Green River and Puyallup River).

Dambacher, J. M., M. W. Buktenica an[illegible]. L. Larson. 1992. Distribution, abundance, and habitat utilization of bull trout and brook trout in Sun Creek, Crater Lake National Park, Oregon. Pages 30-36 *in* P. J. Howell and D. V. Buchanan. Proceedings of the Gearhart Mountain bull trout workshop. Oregon Chapter of the American Fisheries Society. Corvalis, Oregon. *in* MBTSG 1998.

Des Moines Creek Basin Committee. 1997. Des Moines Creek Basin Plan. City of SeaTac, City of Des Moines, Port of Seattle, King County, November 1997.

Donald, D.B., and D.J. Alger. 1993. Geographic distribution, species displacement, and niche overlap for lake trout and bull trout in mountain lakes. Canadian Journal of Zoology. 71:238-247.

Earth Tech, Inc. 2000. Seattle-Tacoma Airport Master Plan Update, Low Streamflow Analysis. Prepared for Port of Seattle. December 2000. 29 pp plus Appendixes.

Eisler, R. 1984. Trace metal changes associated with age of marine vertebrates. Biological Trace Element Research 6:165-180.*in* Eisler, R. 1993. Zinc Hazards to Fish, Wildlife, and Invertebrates: A Synoptic Review. USFWS. Biological Report 10. Contaminate Hazards Review Report 26. April 1993

Eisler, R. 1993. Zinc hazards to fish, wildlife, and invertebrates: A synoptic review. USGS/BRD/BSR- 1997-0002, Biological Sciences Report , Contaminant Hazard Reviews Report 26. April 1993.

Eisler, R. 1998. Copper hazards to fish, wildlife, and invertebrates: A synoptic review. USFWS, Biological Report 10, Contaminant Hazard Reviews Report 33. January 1998.

Eisler, R., and G. R. Gardner. 1973. Acute toxicology to an estuarine teleost of mixtures of cadmium, copper and zinc salts. Journal of Fish Biology 5:131-142 *in* Eisler, R. 1993. Zinc Hazards to Fish, Wildlife, and Invertebrates: A Synoptic Review. USFWS. Contaminate Hazards Review Report 26. April 1993.

Eisler, R. 1993. Zinc hazards to fish, wildlife, and invertebrates: A synoptic review. USFWS, Biological Report 10, Contaminant Hazard Reviews Report 26. April 1993.

Environmental Protection Agency (EPA). 1987. Ambient water quality criteria for zinc-1987. U.S. Environmental Protection Agency Report 440/5-87-003. 207 pp. *in* Eisler 1993.

Federal Aviation Administration (FAA). 1995. Letter transmitting FAA determination of effects for a new parallel runway and associated facilities at the Seattle-Tacoma International Airport

as part of the Master Plan Update and addendum to Biological Assessment. Renton, Washington. December 14, 1995.

FAA. 1999. Wildlife Strikes to Civil aircraft in the United States 1990-1998. FAA, Wildlife Aircraft Strike Database, Serial Report No. 5, November 1999, Washington, DC.

FAA. 2001. Personal communication. Letter dated May 11, 2001 from Lowell H. Johnson, FAA to Ken. S. Berg, USFWS.

Forest Ecosystem Management Assessment Team (FEMAT). 1993. Forest ecosystem management: an ecological, economic, and social assessment. July 1993.

Fraley, J. J. and B. B. Shepard. 1989. Life history, ecology and population status of migratory bull trout (Salvelinus confluentus) in the Flathead Lake and River System, Montana. Northwest Science 63:133-143.

Ghanmi, Z., M. Rouabhia, O. Othmane, and P. A. Deschaux. 1989. Effects of metal ions on cyprinid fish immune response: in vitro effects of Zn2+ and Mn2+ on the mitogenetic response of carp pronephros lymphocytes. Ecotoxicology and Environmental Safety 17:183-189. *in* Eisler 1993.

Goetz, F. A. 1989. Biology of the bull trout *Salvelinus confluentus*: a literature review. U. S. Forest Service, Willamette National Forest, Eugene, Oregon. *in* MBTSG 1998.

Goetz, F. A. 1994. Distribution and juvenile ecology of bull trout (*Salvelinus confluentus*) in the Cascade Mountains. Corvallis, Oregon, Oregon State University: 173 pp.

Goodrich, M. S., L. H. Dulak, M. A. Freidman, and J. J. Lech. 1991. Acute and longterm toxicity of water-soluble cationic polymers to rainbow trout (*Oncorhynchus mykiss*) and the modification of toxicity by humic acid. Environ. Toxicol. Chem. 10:509-551.

Graham, P. J., Shepard, B. B., and Fraley, J. J. 1981. Use of stream habitat classifications to identify bull trout spawning areas in streams. Pages 186-190 *in* N. B. Armantrout. Acquisition and utilization of aquatic habitat inventory information. American Fisheries Society. Portland, Oregon.

Grettenberger, J., M. Wilson, D. DeGhetto and M. Mahaffy. In prep. Contaminant levels, body condition and food habits of marbled murrelets in Washington.

Grubb, T. G. 1976. A survey and analysis of bald eagle nesting in western Washington. Master's of Science Thesis, Univ. of Washington, Seattle. 87 pp.

Hamer, T. E. and E. B. Cummins. 1990. Forest habitat relationships of marbled murrelets in northwestern Washington. Unpublished report, Wildlife Management Division, Nongame Program, Washington Department of Wildlife, Olympia, Washington.

Hamer, T. E. and E. B. Cummins. 1991. Relationships between forest characteristics and use of inland sites by marbled murrelets in northwestern Washington. Unpubl. report, Wildlife Management Division, Nongame Program, Washington Department of Wildlife, Olympia, Washington.

Hilmy, A. M., N. A. El-Domiaty, A. Y. Daabees, and A. Alsarha. 1987. The toxicity to *Clarias lazera* of copper and zinc applied jointly. Comparative Biochemistry and Physiology 87C:309-314. *in* Eisler 1993.

Huston, J. E. 1975. Hungry Horse Reservoir study. Job progress report. Project F-34-R-9, Job II-a. Montana Department of Fish and Game, Helena *in* MBTSG 1998.

Jakober, M. 1995. Influence of stream size and morphology on the seasonal distribution and habitat use of resident bull trout and westslope cutthroat trout in Montana. Master's Thesis. Montana State University, Bozeman.

Jodice, P. and M. W. Collopy. 1995. Habitat selection and activity patterns of marbled murrelets (*Brachyramphus marmoratus*) in forest and marine ecosystems. Fiscal year 1995 Annual Report, National Biological Service, Corvallis, Oregon. 8pp. *in* USFWS 1997.

Jones and Stokes. 1990. City of Tukwila water resource rating and buffer recommendations. Prepared by Jones and Stokes, Bellevue, Washington *in* City of Tukwila 2000.

Karr, J. R. and E. W. Chu. 1999. Restoring life in running waters: better biological monitoring. Island Press. Washington, D. C. 206pp.

Kelley, J. 2000. Personal communication with Nancy Brennan-Dubbs. December 29, 2000.

Kleindl, W. J. 1995. A benthic index of biological integrity for Puget Sound lowland streams, Washington. Masters Thesis, Univ. of Washington. *in* Karr and Chu. 1999.

King, J. G. and G. A. Sanger. 1979. Oil vulnerability index for marine oriented birds *in* J. C. Bartonek and D. N. Nettleship (eds). Conservation of marine birds of North America. Wildlife Research Report 11, USFWS, Washington, D. C. *in* USFWS 1997.

King County Capital Improvement Project Design Team. 1999. Des Moines Creek regional capital improvement projects preliminary design report. CIP Design Team, King County Department of Natural Resources, Water and Land Resources Division, Seattle, Washington *in* Master Plan update improvements Seattle-Tacoma International Airport, June 2000.

Klop, M. 2001. Personal communication. Whidbey Island Naval Air Station. Washington.

Kraemer, C. in prep. Some observations on the life history and behavior of the native char, Dolly Varden (*Salvelinus malma*) and bull trout (*Salvelinus confluentus*) of the north Puget Sound region. WDFW Manuscript in preparation.

Kraemer, C. No date. Personal communication. *in* Washington Department of Fish and Wildlife. 1997.

Kuletz, K. J., D. K. Marks, D. Flint, R. Burns, and L. Pretash. 1995. Marbled murrelet foraging patterns and pilot productivity index for murrelets in Prince William Sound, Alaska. Unpubl. Report, U. S. Fish and Wildlife Service, Exxon Valdez Oil Spill Restoration Project 94102, Anchorage, Alaska. *in* USFWS 1997.

Leathe, S. A. and P. J. Graham. 1982. Flathead Lake fish food habits study. EPA Final Report R008224-0104. Montana Department of Fish, Wildlife and Parks, Helena *in* MBTSG 1998.

Larrison, E. J. and K. J. Sonnenberg. 1968. Washington birds: Their location and identification. Seattle Audubon Soc., Seattle, WA. 258 pp.

Levitt, E. 2001. Personal communication. Port of Seattle, Sea-Tac International Airport.

Lynch, J. M. 2001. Personal communication. Letter dated March 26, 2001 to Carol Schuler. Stoel Rives LLP

MacCall, A. D. no date. Personal communication. National Marine Fisheries Service, Tiburon Laboratory, Tiburon, California. *in* USFWS 1997.

Marshall, D. B. 1988. Status of the marbled murrelet in North America: with special emphasis on populations in California, Oregon, and Washington. U. S. Fish Wildl. Serv., Biological Report 88(30). 19 pp.

Marshall, D. B. 1989. The marbled murrelet. Audubon Wildlife Report. Pages 435-455.

Mavros, W. 2001a. Personal communication by E-mail. King County, Department of Natural Resources. April 30, 2001.

Mavros, W. 2001b. Personal communication. King County, Department of Natural Resources.

MacKay, W., M. Brewin, and M. Monita, eds. 1997. Friends of the bull trout Conference Proceedings. Bull trout Task Force (Alberta), c/o Trout Unlimited Canada, Calgary.

McPhail, J. D., and C. B. McMurry. 1979. The early life-history and ecology of Dolly Varden (*Salvelinus malma*) in the Upper Arrow Lakes. A report submitted to the B.C. Hydro and Power Authority and Kootenay Region Fish and Wildlife Branch. Helena, Montana.

Meister, R. T. (ed). 1995. Farm Chemicals Handbook. Vol. 81, Meister Publishing Company, Willoughby, Ohio.

Mongillo, P. 1993. The distribution and status of bull trout/Dolly Varden in Washington State.

Washington Department of Wildlife. Fisheries Management Division, Report 93-22. Olympia, Washington. 45 pp.

Montana Bull Trout Scientific Group (MBTSG). 1998. The relationship between land management activities and habitat requirements of bull trout. Report prepared for theMontana BullTrout Restoration Team, Helena, MT.

National Oceanographic and Atmospheric Administration. 1999. Screening Quick Reference Tables. Revised October 5, 1999. http://response.restoration.noaa.gov/cpr/sediment/squirt/squirt.html

Nelson, K. 1997. Marbled Murrelet. Birds of North America 276. The Academy of Natural Sciences. 31 pp.

Nelson, S. K. 1989. Development of inventory techniques for surveying marbled murrelets (*Brachyramphus marmoratus*) in the central Oregon coast range. Final report to ODFW. Publication No. 88-6-01.

Nelson, S. K. 1990. List of potential and suspected potential nesting areas for marbled murrelets in the Oregon coast ranges. February 9, 1990, unpubl.

Norman, D. 2001. Letter to J. Freedman and A. Kenny regarding Corps Permit Application1996-4-02325 for the Third Runway at Sea-Tac International Airport, February, 2001 *in* Airport Communities Coalition. 2001. An examination of issues related to the Port of Seattle's Proposed Third Runway at SeaTac International Airport. Unpublished.

Nysewander, D. 2000. Personal communication. WDFW, Olympia, Washington.

Osmek, S. 2001a. Personal communication. Letter dated April 20, 2001. Port of Seattle, Sea-Tac.

Osmek, S. 2001b. Personal communication. April, 2001. Port of Seattle, Sea-Tac.

Pacific Groundwater Group (PGG). 2000. Sea-Tac runway fill hydrologic studies report. JE9907. Prepared for Washington State Department of Ecology, Northwest Regional Office. June 19, 2000. 79 pp. plus appendixes.

Pantella, D. 1996. Personal communication. WDFW, Olympia, Washington. *in* USFWS 1997.

Parametrix, Inc. 2000a. Comprehensive Stormwater Management Plan. Master Plan Update Improvements, Seattle-Tacoma International Airport. #556-2912-001. 4 volumes. December 2000.

Parametrix, Inc. 2000b. Final Natural Resource Mitigation Plan. Master Plan Update Improvements, Seattle-Tacoma International Airport. #556-2912-001. December 2000.

Partee, R .1999. Personal communication Conversation with Doug Gresham, Herrera Environmental Consultants, Inc. regarding fish presence in Gilliam Creek, March 11, 1999. *in* City of Tukwila 2000.

Partee, R. 2000. Declaration of Ryan R. Partee. Airport Communities Coalition, et. al., v. Federal Aviation Administration and Port of Seattle. United States District Court, Western District of Washington at Seattle. No. C00-915R. June 29, 2000

Paton, P. W. C. and C. J. Ralph. 1990. Distribution of the marbled murrelet at inland sites in California. Northwestern Naturalist 71:72-84.

Paulauskis, J. D., and R. W. Winner. 1988. Effects of water hardness and humic acid on zinc toxicity to Daphnia magna Straus. Aquatic Toxicology 12:273-290 *in* R. Eisner. 1993.

Perkins, S. 1999. Geomorphic evaluation of gravel placement in the Green River, Washington. Report prepared for Jones and Stokes Associates, Inc., Bellevue, Washington and the U. S. Army Corps of Engineers, Seattle District, Seattle Washington. 50 pp.

Pratt, K. L. 1992. A review of bull trout life history. Pages 5-9 *in* P. J. Howell and D. V. Buchanan, eds. Proceedings of the Gearhart Mountain bull trout workshop. Oregon Chapter of the American Fisheries Society, Corvallis, Oregon.

PSWQAT (Puget Sound Water Quality Action Team). 1998. 1998 Puget Sound update: Report of the Puget Sound Ambient Monitoring Program, Puget Sound Water Quality Action Team, Olympia, Washington. *in* PSWQAT 2000.

PSWQAT 2000. 2000 Puget Sound update: Report of the Puget Sound Ambient Monitoring Program. Puget Sound Water Quality Action Team, Olympia, Washington. March 2000. 127 pp.

Ralph, C. J., S. K. Nelson, M. M. Shaughnessy, and S. L. Miller, compilers. 1993. Methods for surveying marbled murrelets in forests. Pacific Seabird Group, Oregon Cooperative Wildlife Research Unit, Oregon State University, Corvallis, Oregon. Technical Paper #1.

Ralph, C. J., G. L. Hunt, Jr., M. G. Raphael, and J. F. Piatt (Tech. eds.). 1995a. Ecology and conservation of the marbled murrelet. Gen. Tech. Rep. PSW-GTR-152. Pacific Southwest Research Station, Forest Service, U. S. Dept. of Agric. Albany, CA. 420pp.

Ralph, C. J., G. L. Hunt, Jr., M.G. Raphael, and J. F. Piatt. 1995b. Ecology and Conservation of the Marbled Murrelet in North America: An Overview. *In*: Ralph, C.J., G.L. Hunt, Jr., M.G. Raphael and J. F. Piatt (Tech. Eds.). 1995. Ecology and conservation of the marbled murrelet. Gen. Tech. Rept. PSW-GTR-152. Albany, California: Pacific Southwest Experiment Station, U.S. Department of Agriculture, Forest Service. 420 pp.

Ratliff, D. E. and P. J. Howell. 1992. The status of bull trout populations in Oregon. *in*: P. J.

Howell and D.V. Buchanan (eds.). Pages 10-17. Proceedings of the Gearhart Mountain bull trout workshop. Oregon Chapter of the American Fisheries Society, Corvallis, Oregon.

Rhodes, J. J., D. A. McCullough, and F. A. Espinosa. 1994. A coarse screening process for potential application in ESA consultations. Submitted to NMFS, NMFS/FHWA Interagency Agreement 40 ABNF3.

Rieman, B. E., D. C. Lee, and R. F. Thurow. 1997. Distribution, status, and likely future trends of bull trout within the Columbia River and Klamath Basins. North American Journal of Fisheries Management 17:1111-1125.

Rieman, B.E., and J. R. Lukens. 1979. Lake and Reservoir Investigations: Priest Lake Creel Census. Boise, ID: Idaho Department of Fish and Game. 105 p. Job Completion Report. Proj. F-73-R-1, subproject III. *in* Rieman, B. E. and J. D. McIntyre. 1993.

Rieman, B. E. and J. D. McIntyre. 1993. Demographic and habitat requirements for conservation of bull trout. U. S. Forest Service General Technical Report - INT 3302.

Rieman, B.E. and J.D. McIntyre. 1996. Spatial and temporal variability in bull trout redd counts. North American Journal of Fisheries Management 16:132-141. (Bull Trout - B133).

Rozeboom, W. 2001. Personal communication. Meeting with USFWS and ACC. Northwest Hydraulic Consultants, Inc. April 19, 2001.

Sealy, S. G. 1975. Feeding ecology of the ancient and marbled murrelets near Langara Island, British Columbia. Can. J. Zool. 53:418-433 *in* USFWS 1997.

Sealy, S. G. and H. R. Carter. 1984. At-sea distribution and nesting habitat of the marbled murrelet in British Columbia: Problems in the conservation of a solitarily nesting seabird. *in* Croxal, et al. eds., 1984. Pages 737-756.

Shepard, B., S.A. Leathe, T. M. Weaver, and M. D. Enk. 1984. Monitoring levels of fine sediment within tributaries to Flathead Lake, and impacts of fine sediment on bull trout recruitment. Proceedings of the Wild Trout III Symposium. Yellowstone National Park, Wyoming. On file at: Montana Department of Fish Wildlife, and Parks, Kalispell, Montana.

Skidmore, J. E 1964. Toxicity of zinc compounds to aquatic animals, with special reference to fish. Quarterly Review of Biology 39:227-248. *in* Eisler 1993.

Smith, K. 2001. Personal communication. E-mail dated May 2, 2001. Port of Seattle, Sea-Tac International Airport.

Sojka, R. E. and R. D. Lentz. no date. A brief history of PAM and PAM-related issues. http:/kimberly.ars.usda.gov/PamPrim.shtml

Spear, P. A. 1981. Zinc in the aquatic environment: chemistry, distribution, and toxicology. National Research Council of Canada Publication NRCC 17589. 145 pp. *in* Eisler 1993.

Speich, S. M., and T. R. Wahl. 1995. Marbled murrelet populations of Washington-marine habitat preferences and variability of occurrence. *in*: C.J. Ralph, G.L. Hunt, M. Raphael, and J. F. Piatt (Tech eds). Ecology and Conservation of the Marbled Murrelet. Gen. Tech. Rept. PSW-GTR-152. Albany, CA: Pacific Southwest Experiment Station, U.S. Dept. of Agriculture, Forest Service. 420 pp.

Stalmaster, M. S. 1987. The Bald Eagle. Universe Books, New York, NY. 227pp.

Stalmaster, M. V., R. L. Knight, B. L. Holder, R. J. Anderson. 1985. Bald eagles. Pages 269-290 *in* E. R. Brown, ed. Management of wildlife and fish habitats in forests of western Oregon and Washington: USDA Forest Service, PNW Region, Portland, OR. 332 pp.

Stein, J. and D. Nysewander. 1999. An estimate of marbled murrelet productivity from observations of juveniles on the inland marine waters of Washington State during the 1993 through 1995 post-breeding seasons. WDFW Final Report, Olympia, Washington. July 1999. 15 pp. plus tables and figures.

Strong, C. S. 1995. Distribution of marbled murrelets along the Oregon coast in 1992 *in* S. K. Nelson and S. G. Sealy (eds). Biology of the marbled murrelet: inland and at sea - a symposium of the Pacific Seabird Group 1993. Northwestern Naturalist 76:99-105.

Suckley and Cooper. 1860. Reports explorations and surveys, to ascertain the most practicable and economical route for a railroad from the Mississippi River to the Pacific Ocean. Vol. XII. Book II. Thomas H. Ford, Printer, Washington.

Swanberg, T. 1997. Movements of and habitat use by fluvial bull trout in the Blackfoot River, Montana. Transactions of the American Fisheries Society. 126: 735-746.

Taylor Associates, Inc. 2001. Take permit TE-034300-0, Annual Report. Unpublished memo from Jim Shannon to Western Washington Fish and Wildlife Service Office, Lacey, Washington.

Tims, J. L. 1995. Biological Assessment and request for concurrence for a new parallel runway and associated facilities at the Seattle-Tacoma International Airport as part of the Master Plan Update. Shapiro and Associates, Seattle, Washington. December 6, 1995.

U.S. Department of Agriculture and U.S. Department of the Interior. 1994. Record of decision for amendments to Forest Service and Bureau of Land Management planning documents within the range of the northern spotted owl. Portland, Oregon.

U.S. Department of Interior. 1998a. Reinitiation of intra-Service biological opinion on the addition of the Columbia River distinct population segment of bull trout to incidental take

permit (PRT-808398) for Plum Creek Timber Company (FWS Reference: 1-3-98-FR-0357; X-Reference: 1-3-96-FW-0190) in accordance with the unlisted species provisions of the implementation agreement for all vertebrate species. U.S. Fish and Wildlife Service. Western Washington Office, Lacey, Washington. July 13, 1998.

U.S. Department of Interior. 1998b. Reinitiation of the biological opinion and conference opinion on the amendment of an incidental take permit (PRT-812521) for the Washington State Department of Natural Resources' Habitat Conservation Plan to include bull trout *(Salvelinus confluentus)* on the permit (Service Reference: 1-3-96-FW-594; X-Reference: 1-3-97-HCP-013). U.S. Fish and Wildlife Service. Western Washington Office. Lacey, Washington. December 18, 1998.

U.S. Department of Interior. 1999a. Endangered and threatened wildlife and plants; determination of threatened status for bull trout in the coterminous United States; final rule. Notice of intent to prepare a proposed special rule pursuant to section 4(d) of the Endangered Species Act for the bull trout; proposed rule. U.S. Fish and Wildlife Service. Federal Register Vol. 64:58910. November 1, 1999.

U.S. Department of Interior. 1999b. Endangered and threatened wildlife and plants; proposed rule to remove the bald eagle in the lower 48 states from the list of endangered and threatened wildlife. Proposed Rule. 50 CRF Part 17. July 6, 1999.

U.S. Department of Interior. 2000. Biological and Conference Opinions for the Issuance of an Incidental Take Permit to Simpson Timber Company, Northwest Operations, for Simpson Washington Timberlands Habitat Conservation Plan, in Mason, Grays Harbor, and Thurston Counties, Washington (FWS Ref: 1-3-00-FWF-2098; X-Reference: USFWS-PRT-TE032463-0). U.S. Fish and Wildlife Service. Western Washington Office. Lacey, Washington. October 12, 2000.

U.S. Fish and Wildlife Service. 1986. Pacific bald eagle recovery plan. U.S. Department of the Interior, Fish and Wildlife Service, Portland, Oregon. 163 pp.

U.S. Fish and Wildlife Service. 1994. Biological opinion for Alternative 9 of the final supplemental impact statement on management of habitat for late-successional and old-growth forest related species within the range of the northern spotted owl. U.S. Fish and Wildlife Service, Portland, Oregon. 52 pp.

U.S. Fish and Wildlife Service. 1995. Letter of concurrence for a new parallel runway and associated facilities at the Seattle-Tacoma International Airport as part of the Master Plan Update. (FWS Ref.: 1-3-96-I-29). U.S. Fish and Wildlife Service. Western Washington Office, Lacey, Washington. December 6, 1995.

U.S. Fish and Wildlife Service. 1996. Biological opinion for the Puget Sound area non-treaty commercial salmon net fisheries on the marbled murrelet. (FWS Ref: 1-3-96-F-236). U.S. Fish and Wildlife Service. Western Washington Office, Lacey, Washington. April 10, 1996.

U.S. Fish and Wildlife Service. 1997. Recovery plan for the threatened marbled murrelet (*Brachyramphus marmoratus*) in Washington, Oregon, and California. U.S. Fish and Wildlife Service, Portland, Oregon. 203 pp.

U.S. Fish and Wildlife Service. 1999a. Biological opinion for the Point Roberts golf course (FWS Ref: 1-3-99-F-1085). U.S. Fish and Wildlife Service. Western Washington Office. Lacey, Washington. December 13,1999.

U.S. Fish and Wildlife Service. 1999b. Biological opinion for the treaty commercial salmon net fisheries in the Strait of Juan de Fuca and Puget Sound (Areas 4, 4B, 5, 6, 6C, 7, 7A, 7B, 7C, 7D, 8, 8A, 8D, 9A, 10, 10A, 11, 11A, 12, 12A, 12B, 12C, 12D, 13, 13A, and 13 D-K) (FES Ref. 1-3-99-F-0835). U.S. Fish and Wildlife Service. Western Washington Office, Lacey, Washington. June 16, 1999.

U.S. Forest Service, National Marine Fisheries Service, Bureau of Land Management, U.S. Fish and Wildlife Service, National Park Service, and Environmental Protection Agency. 1993. Forest Ecosystem Management: An ecological, economic, and social assessment. July 1993. Also known as the FEMAT Report. USDA Forest Service, Pacific Northwest Region, Portland, Oregon.

Vigelanti, M. 2001. Personal communication, telephone conversation. Synergy Consultants. April 16, 2001.

Varoujean, D.H., and W.A. Williams. 1995. Abundance and distribution of marbled murrelets in Oregon and Washington based on aerial surveys. *in*: C.J. Ralph, G. L. Hunt, M. Raphael, and J. F. Piatt (Tech. Eds). Ecology and Conservation of the Marbled Murrelet. Gen. Tech. Rept. PSW-GTR-152. Albany, CA: Pacific Southwest Experiment Station, Forest Service, U.S. Dept. of Agriculture. 420 pp.

Walker, M. 2001. Personal communication. Army Corps of Engineers, Seattle, Washington.

Warner, E. J. 1997 Personal communication. Telephone conversation on March 24, 1997. Muckleshoot Indian Tribe (MIT). Fisheries Department.

Warner, E. J. 2000. Personal communication. Muckleshoot Indian Tribe (MIT). Fisheries Department.

Washington Department of Ecology (WDOE). 2000. Final 1998 Section 303(d) list [water quality limited streams in Washington State, Section 303(d) of the Federal Clean Water Act]. April 4, 2000. Washington Department of Ecology, Water Quality Program, Olympia, Washington.

WDOE. 1998. Fact sheet. NPDES permit WA-002465-1. Port of Seattle, Seattle-Tacoma Airport. February 20, 1998.

Washington Department of Fish and Wildlife (WDFW). 1995. 1994 Washington State

baitfish stock status report. Unpubli. Report. Washington Department of Fish and Wildlife, Fisheries Management Division, Olympia, Washington. 77 pp. *in* USFWS 1997.

WDFW. 1997. Grandy Creek trout hatchery Biological Assessment. March 1997. 61 pp. plus appendixes.

WDFW. 1998. 1998 Washington salmonid stock inventory: bull trout/Dolly Varden. Olympia, Washington. 437 pp.

WDFW. 2000. Critical spawning habitat for herring, surf smelt, sand lance, and rock sole in Puget Sound, Washington. Olympia, Washington. March 2000.

Wahl, T. R., S. M. Speich, D. A. Manuwal, K. V. Hirsch, and C. Miller. 1981. Marine bird populations of the Strait of Juan de Fuca, Strait of Georgia, and adjacent waters in 1978 and 1979. Interagency Energy-Env. Res. Dev. Prog. Rept., EPA-600/7-81-156, NOAA, Mar. Eco. anal. Prog., Seattle, Washington.

Watson, G. and S. Toth. 1994. Limiting factors analysis for salmonid fish stocks in the Plum Creek habitat conservation plan (HCP) area. December 14, 1994 draft of fish limiting factors analysis. *in* WDFW 1997.

Weatherley, A. H., P. S. Lake, and S.C. Rogers. 1980. Zinc pollution and the ecology of the freshwater environment. Pages 337-417 in J. O. Nriagu, ed. Zinc in the environment. Part I: ecological cycling. John Wiley, New York *in* R. Eisner. 1993

Weaver, T. M. and R. G. White. 1985. Coal Creek Fisheries monitoring study No. III. Quarterly progress report. U. S. Forest Service, Montana State Cooperative Fisheries Research Unit, Bozeman, MT.

Williams, K. R. and J. M. Mullan. 1992. Implications of age, growth, distribution, and other vitae for rainbow/steelhead, cutthroat, brook, and bull trout in the Metow River, Washington. Appendix K in Mullan, J. W., K, R. Williams, G. Rhodus, T. W. Hillman and J. D. McIntyre 1992. Production and habitat of salmonids in Mid-Columbia River tributary streams. U.S. Fish and Wildlife Service Monograph I.

Wilson, R. W. and E. W. Taylor 1993. Differential responses to copper in rainbow trout (*Oncorhynchus mykiss*) acclimated to sea water and brackish water. J. of Comparative Physiology 163B:239-246. *in* R. Eisler. 1998.

Wright, S. 2001. Personal communication. The data belongs to the Federal Aviation Administration and is formally referred to as the FAA Wildlife Strike Database. U.S. Dept of Agriculture, National Wildlife Research Center.

Wydoski, R. S. and R. R. Whitney. 1979. Inland fishes of Washington, Seattle, Washington and London. University of Washington Press. 220pp.

Wyman, K. H. 1975. Two unfished salmonid populations in Lake Chester Morse. M.S. Thesis, University of Washington. Seattle, Washington.

Ziller, J. S. 1992. Distribution and relative abundance of bull trout in the Sprague River Subbasin, Oregon. Pages 18-29 *in* P. J. Howell and D. V. Buchanan. Proceedings of the Gearhart Mountain bull trout workshop. Oregon Chapter of the American Fisheries

Enclosure A

ATTACHMENT A

Response to U.S. Fish and Wildlife Service Comments and Recommendations
Concerning Embankment Fill at Seattle-Tacoma International Airport
(FWS Comments and Recommendations in Bold)

1. All fill material within the first 20 feet above the rock underdrain of the embankment fill shall be contaminant free (e.g., below probable affect levels stated in the appropriate NOAA SQuiRT tables or below background levels found within the area).

Through its Clean Water Act section 401 permitting process, Washington Department of Ecology (Ecology) has required the Port to develop a process for insuring that contaminated fill material *is not* incorporated into the Third Runway embankment. The screening process developed by the Port includes the use of MTCA Method A standards as a tool to evaluate what is or is not environmentally suitable for placement in the embankment. In our January 22, 2001, meeting, and in its February 27, 2001, comments, FWS requested additional information concerning the Port's screening process, including information indicating this process is adequately protective of listed species.

First, it is important to recognize that the Port is not accepting large amounts of soil with constituent concentrations just at or below levels defined as "clean" by MTCA Method A standards. Over 50 percent of the soil placed in the Third Runway embankment to date has been from large pits, most state-certified, without historical sources of contamination. Though it is the responsibility of the individual contractor to identify sources of fill material, the Port anticipates that large pits will continue to be a primary source of fill for the embankment. Second, the remaining amount of embankment fill will not include contaminated soil that has been remediated to MTCA Method A standards. Rather, such soil will be taken from sites or portions of sites that have not historically been affected by contamination. Thus, Method A standards in this case are used simply as a screening tool to verify that clean fill sources are in fact clean.

To evaluate the environmental suitability of a proposed fill source, the Port currently requires that, for those fill sources for which testing is mandated, the supplier at a minimum test for concentrations of total petroleum hydrocarbons (TPH) and the eight Resource Conservation and Recovery Act (RCRA) metals. Analysis for chemicals other than TPH and metals is presently required based upon site-specific conditions. The approach used for evaluating appropriate testing, including location of samples, number of samples, and type of analysis, is similar to that used for Phase I and Phase II Environmental Site Assessments as discussed below.

When the Washington Department of Ecology and the Port developed the process for evaluating fill material proposed for placement in the Third Runway embankment, they used standards for conducting Phase I and Phase II Environmental Site Assessments as a model. Typically, Phase I and Phase II Environmental Site Assessments are

conducted to identify environmental conditions at a site prior to some change of use or ownership. The nationally-accepted standard for these assessments is the American Society for Testing and Materials Standard (ASTM) Practice for Environmental Site Assessment: Phase I and Phase II Site Assessment Process (ASTM E 1527 and ASTM E 1903). Though not all ASTM procedures are relevant (e.g., lead paint testing, radon surveys, etc), the basic ASTM procedures for a site reconnaissance, review of historic operations, and appropriate testing to be conducted by a qualified environmental professional were adapted to the fill acceptance process. The use of Phase I and Phase II Environmental Site Assessments as a model is appropriate because it is a nationally-accepted process for evaluating the potential for contamination at a site.

Phase I and Phase II Environmental Site Assessments differ in objectives from Puget Sound Dredge Disposal Analysis (PSDDA) and remedial investigation studies. Phase I and Phase II Environmental Site Assessments look specifically for contamination. In contrast, PSDDA is a program which addresses the management and disposal of sediments that may be contaminated. As a result, sampling and analysis protocols are different. For Phase I and Phase II Environmental Site Assessments, the level of sampling and type of analyses can vary considerably from site to site based on the potential presence of contamination. This approach differs from PSDDA, in that PSDDA specifies a standard sampling protocol, including the number of samples and type of analyses, for evaluating the bulk characteristics of material proposed for open water disposal. This Phase I and II Environmental Site Assessment approach also differs from the more rigorous requirements for remedial investigation studies, which are designed to evaluate impacts from known contaminated sites.

When evaluating the suitability of proposed fill material, the Port uses MTCA Method A standards as a screening tool. However, the final suitability determination relies on best professional judgement. In general, the approach used in evaluating the fill suitability is similar to that of a prospective purchaser evaluating environmental information obtained in Phase I and Phase II Environmental Site Assessments. Careful consideration is given to other factors in addition to chemical test results. These include current and historic site uses, adequacy of the environmental documentation, type of proposed fill material (e.g., native vs. non-native) and the nature of the proposed excavation activities (e.g., Does the contractor have sound operational controls in place?). In some cases, the Port will condition acceptance to a specific area of a site, require ongoing testing and monitoring during excavation, or require regular site inspections to insure the quality of the incoming fill material. For example, the Port may determine that upper non-native soil at a source site may not be suitable because of its potential to contain asphalt or other debris, but that the underlying native soils at the same site are suitable. At the same site the Port may require an environmental professional monitor the site to ensure that the native and non-native materials are indeed separated.

In our January 22, 2001, meeting, and in subsequent comments, FWS inquired as to the protectiveness of Method A standards for the RCRA metals and for organochlorines. The Port will address these issues as follows:

(a) Drainage layer cover: The Port will establish a zone of "ultra-clean" fill above the drainage layer, in an area termed "drainage layer cover." The drainage layer cover will measure at least 40 feet thick at the face of the embankment and will reduce in height to the east at a rate of 2 percent (see Figures 1 and 2). The 2 percent slope is required for consistency with the embankment construction design, which has been developed to allow for appropriate drainage and runoff control. The overall thickness of the drainage layer cover will decrease away from the face of the embankment and will vary based on underlying topography. This configuration allows for the greatest protection for aquatic resources in the areas closest to the wetlands and Miller Creek, and will protect surface water quality in nearby Miller Creek.

(b) RCRA metals: The Port will employ the following standards and protocols concerning the placement of fill in the drainage layer cover with the goal of ensuring that baseline conditions are not altered for surface water receptors:

(i) For the drainage layer cover, as with the remainder of the embankment fill, no soil will be accepted that exceeds MTCA Method A standards for the RCRA metals per agreement with the Washington State Department of Ecology. These values are shown in columns 3 and 4 of Table 1.

(ii) The second column of Table 1 shows values for the RCRA metals that have been calculated using the Washington State Department of Ecology's (Ecology) "Three Phase Partitioning Model." Ecology uses this conservative model to establish soil concentrations that are protective of ground water as a drinking water source (see WAC 173-340-747(3), (4), and (5)) (Attachment B). The values in the second column of Table 1 are derived by using this model to "back-calculate" soil concentrations using freshwater ambient water quality criteria (WAC 173-201A) instead of ground water quality criteria. In other words, the model used by Ecology to establish soil concentrations that are protective of groundwater as a drinking water source has been employed to calculate soil concentrations that are protective of surface water receptors exposed to discharge or seepage from the drainage layer. No soil will be accepted for the drainage layer cover that exceeds the back-calculated values shown in the second column of Table 1 (with adjustments for PQLs and background concentrations as noted in Table 1 footnotes) unless the Synthetic Precipitation Leaching Procedure (SPLP) confirms the suitability of the soil as discussed below in (b)(iv). The Port will consult with the FWS if site-specific data is collected which may merit a recalculation of the three phase model soil concentrations in Table 1, and reinitate consultation as appropriate.

(iii) Column 6 shows Puget Sound Background concentrations for the eight RCRA metals. Exceedences of background metal concentrations can be expected due to the natural variability in soil types which will be offered

from numerous sources in the region. Thus, in column 7, a range of screening criteria between background levels, when available, and Method A standards is shown. In the event the Port desires to establish site-specific background criteria, it will discuss proposed criteria with FWS and reinitiate consultation as appropriate. If the suppliers wish to place soil in the drainage cover layer that exceed background concentrations, the Port will confirm the acceptability of the material by requiring suppliers using that source to conduct sufficient SPLP testing to show that Method A criteria are protective of baseline conditions for surface water receptors.

(iv) To confirm the protectiveness of the Method A standards and the Three Phase Partitioning Model, SPLP testing will be used as a laboratory method to ensure that leaching of metals through potential embankment soil will not occurr at unacceptable levels. SPLP testing according to the procedures contained in WAC 173-340-747(7) and SPLP methodology are shown in Attachments B and D respectively. SPLP results will be compared, as an initial screening tool, to freshwater ambient water quality criteria according to guidelines outlined at WAC 173-201A-040 (Attachment C). If the SPLP results indicate that metals in the proposed fill material *do not leach* at levels above the freshwater ambient water quality criteria, adjusted for PQLs as appropriate, the material will be considered suitable for placement. If the SPLP indicates that metals in the proposed fill material *leach* at levels above ambient water quality criteria, the Port will either reject the material or discuss the results of the SPLP with FWS before acceptance of the material. The Port shall submit to FWS for its review and approval a plan describing the Port's SPLP protocol. The FWS shall approve this plan prior the Port's implementation of the SPLP protocol.

(c) Organochlorines: The Port will employ the following standards and protocols concerning the placement of fill in the drainage layer cover:

(i) The Port will require testing for organochlorines on those sites where such compounds may be present, including sites with potential commercial pesticide applications, and sites with historic wood preserving operations. The supplier, with Port review, will identify sites potentially containing such compounds through the process discussed above under Response 1 (i.e., Phase I and II Environmental Site Assessments). The Port will update guidelines provided to suppliers to clearly state that testing for additional constituents must be conducted as appropriate based on current and historical site land uses.

(ii) As with the remainder of the embankment fill, sources of fill proposed for placement in the drainage layer cover which have detectable levels of organochlorines will not exceed MTCA Method A criteria.

(iii) Sources of fill proposed for placement in the drainage layer cover which have detectable levels of organochlorines will be evaluated using the "Three Phase Partitioning Model" discussed in (b) above. When organochlorines are detected in potential fill, the Port will use the Three Phase Partitioning Model to back-calculate soil concentrations using freshwater ambient water quality criteria. Soil found to contain organochlorines at concentrations below Three Phase Partitioning Model concentrations (adjusted for PQLs) will be deemed acceptable. No soil will be accepted for the drainage layer cover that exceeds Three Phase Partitioning Model concentrations (adjusted for PQLs) unless SPLP testing confirms the suitability of the soil as discussed below in (c)(iv).

(iv) The Port will require SPLP testing when proposed soil exceeds calculated Three Phase Partitioning Model concentrations. SPLP test results will be compared, as an initial screening tool, to freshwater ambient water quality criteria according to guidelines outlined at WAC 173-201A-040 (Attachment C). If the SPLP results indicate that organocholorines in the proposed fill material *do not leach* at levels above the freshwater ambient water quality criteria, adjusted for PQLs as appropriate, the material will be considered suitable for placement. If the SPLP indicates that organochlorines in the proposed fill leach at levels above ambient water quality criteria, the Port will either reject the material or discuss the results of the SPLP with FWS before acceptance of the material, and reinitiate consultation as appropriate.

2. **To isolate organisms in the biologically active zone from contaminants that may be contained in the fill material, the surficial 3 feet of fill should be contaminant free (e.g., below probable affect levels stated in the appropriate NOAA SQuiRTs or below background levels found within the area if available).**

As discussed in our January 22, 2001, meeting, and dates thereafter, from a practical standpoint it is difficult to apply different acceptance criteria to the upper three feet of embankment fill material versus the underlying fill material. Final grading of the embankment will involve working and reworking of the upper material to achieve appropriate compaction and site elevations. Portions of the embankment will be paved for the runway and associated taxiways. Remaining embankment areas will be grass covered and will have very strict wildlife controls (i.e., hazing and elimination) in accordance with FAA regulations to insure aircraft safety.

During our January 22, 2001 meeting, the Port agreed to evaluate the eight RCRA metals with respect to the recently-adopted MTCA regulation WAC 173-340-7490 Terrestrial Ecological Evaluation Procedures (Attachment E). The goal of the terrestrial ecological evaluation process is the protection of terrestrial ecological receptors from exposure to contaminated soil with the potential to cause significant adverse effects. Table 749-2 - Priority Contaminants of Ecological Concern for Sites that Qualify for the Simplified Terrestrial Ecological Evaluation Procedure lists soil concentrations for seven

of the eight RCRA metals (Attachment E). These concentrations are developed to protect wildlife through direct ingestion of soil using a robin/shrew food chain model, two surrogate receptors meant to represent highly exposed species. Soil concentrations were also developed for plants and soil invertebrates using toxicity values from the published literature. The most restrictive value was then placed into Table 749-2.

Generally, the Method A concentrations are less than or similar to Table 749-2 (see Table 1). However, the MTCA Method A standards list does not include values for barium, total chromium or selenium. For these constituents, the Table 749-2 ecological standards listed in Table 1 (adjusted for background and PQLs) will be used as screening criteria for the top three feet of embankment fill.

3. The Port of Seattle will monitor the seepage water from the rock underdrain for contaminants. Monitoring shall be for a period of 10 years, on a monthly basis. Based on the monitoring results, the monitoring schedule may be modified by FWS.

The Port of Seattle shall prepare a water quality monitoring plan to track the quality of seepage from the drainage layer beneath the Third Runway embankment fill. Such a plan shall be prepared to address the amount of monitoring in a tiered or phased approach. For example, if it is determined that water flowing through the new embankment is exceeding designated surface water quality criteria, new monitoring points may be established between the embankment and Miller Creek to evaluate the fate and transport of the impacted fill water. Monitoring Miller Creek would represent the final phase of a monitoring program if it were determined that constituents in embankment fill water were reaching the creek. The Port shall develop a monitoring plan in consultation with FWS. The Port shall submit a draft monitoring plan to FWS for its review and approval within 120 days after FWS' issuance of a biological opinion or concurrence letter. The monitoring plan shall provide for a minimum of three years of monthly monitoring, with the monitoring period commencing upon detection of seepage from the drainage layer of the completed embankment. At the end of the three-year monitoring period, the Port and FWS shall reevaluate the need to modify or continue the monitoring program. In the event seepage is not detected within six years after completion of embankment construction, the Port and FWS shall likewise reevaluate the need to modify or continue the monitoring program.

4, 5. If material is used which is known to have contaminants, this material shall be distributed over a large area to avoid creating a "hot spot" in the embankment. The Port of Seattle will request FWS approval for those fill materials proposed that do not meet MTCA Method A standards, at a minimum. Information on why these materials are to be used and proof that their chemical constituents/levels will not result in environmental impacts to aquatic organisms needs to be provided.

The use of MTCA Method A as a screening standard for incoming fill material will avoid the creation of "hot spots" in the embankment. In the event that the Port considers placement of fill materials that do not meet MTCA Method A standards, the Port will discuss results with FWS and consultation will be reinitiated as appropriate.

Acceptance of material above MTCA Method A standards requires Ecology approval. Discussion with the agencies will provide information regarding the environmental suitability of this material and proposed placement methods and locations.

TABLE 1
SOIL SCREENING CRITERIA FOR THIRD RUNWAY EMBANKMENT FILL (MG/KG)

		MTCA(a) – Unrestricted Land Use				Screening Criteria	
RCRA Metals	Three Phase Partitioning Model Concentrations(b)	Current Method A Standard	Proposed Method A Standard (c)	Proposed Ecological Standard (c)	Puget Sound Background (Upper 90%) (d)	Drainage Layer Cover	Top 3-feet Embankment
Arsenic	88	20	20	95 (As V)	7	7 to 20 (e)	20 (
Barium	12000	NA	NA	1250	NA	12,000 (f)	1250 (n
Cadmium	0.15	2	2	25	1	1 to 2 (g)	2 (
Chromium (Total)	NA	100	NA	42	48	48 to 100 (g), (h)	48 (n
Lead	500	250	250	220	24	24 to 250 (i)	220 (n
Mercury (Inorganic)	0.013	1	2	9	0.07	0.07 to 2 (g)	2 (
Selenium	0.52	NA	NA	0.8	NA	5 (PQL), (j), (k)	5 (PQL), (
Silver	0.11	NA	NA	NA	NA	5 (PQL), (j), (k)	5 (PQL), (

Note: See associated text in Attachment A for related discussion.

Footnotes:

NA: Not available. Insufficient information available to develop criteria.

PQL: Practical Quantitation Limit

(a) Model Toxics Control Act WAC 173-340.

(b) MTCA WAC 173-340 747 (3), (4), and (5) Three Phase Partitioning Model soil concentrations calculated using aquatic freshwater quality criteria (WA 173-201A). For purposes of this table, the lowest criteria from "Freshwater CCC Chronic" Screening Quick Reference Table (NOAA SQuiRT Table) wer used.

(c) Proposed Method A and Ecological standards were finalized on February 15, 2001, and will become effective on August 15, 2001.

(d) Natural Background Soil Metals in Washington State (Ecology Publication 94-115).

(e) The MTCA Method A standard of 20 mg/kg is less than the Three Phase Partitioning Model concentration of 88 mg/kg indicating that the Method A standard is protective of surface water receptors. When soil concentrations are greater than background but below the Method A standard, sufficient SPLP testing will be conducted to confirm that the Method A standard is protective (see associated text in Attachment A for discussion of SPLP testing.

(f) Three Phase Partitioning Model concentrations calculated using MTCA Method B ground water quality criteria because there was no available criteria for barium in surface water. If concentrations exceed calculated values, SPLP testing will be required to evaluate the suitability of the soil.

(g) Three Phase Partitioning Model concentrations, adjusted upward to background, and Method A standards. To verify the protectiveness of Method A standards, SPLP testing will be conducted when soil concentrations exceed background but are below Method A standards. (Note: exceedances in background concentrations anticipated due to natural variability of soil types being used as fill.)

(h) Chromium speciation may be conducted in the event SPLP is applied.

(i) The MTCA Method A standard of 250 mg/kg is less than the Three Phase Partitioning Model concentration of 500 mg/kg indicating that the Method A standard is protective of surface water receptors. When soil concentrations are greater than background but the Method A standard, sufficient SPLP testing will be conducted to confirm that the Method A standard is protective.

(j) PQLS from Department of Ecology "Implementation Memo No. 3: PQLs as Cleanup Standards", November 24, 1993.

(k) Three Phase Partitioning Model concentrations, adjusted upward to PQL. If soil concentrations exceed the PQL, SPLP testing will be required to evaluate the suitability of the soil.

(l) Screening criteria based on MTCA Method A standards.

(m) Screening criteria based on ecological standards.

(n) Screening criteria based on ecological standards, adjusted for background.

ATTACHMENT B

WAC 173-340-747(3-5, 7) (February 12, 2001)

WAC 173-340-747 (3) Overview of methods. This subsection provides an overview of the methods specified in subsections (4) through (10) of this section for deriving soil concentrations that meet the criteria specified in subsection (2) of this section. Certain methods are tailored for particular types of hazardous substances or sites. Certain methods are more complex than others and certain methods require the use of site-specific data. The specific requirements for deriving a soil concentration under a particular method may also depend on the hazardous substance.

(a) Fixed parameter three-phase partitioning model. The three-phase partitioning model with fixed input parameters may be used to establish a soil concentration for any hazardous substance. Site-specific data are not required for use of this model. See subsection (4) of this section.

(b) Variable parameter three-phase partitioning model. The three-phase partitioning model with variable input parameters may be used to establish a soil concentration for any hazardous substance. Site-specific data are required for use of this model. See subsection (5) of this section.

(c) Four-phase partitioning model. The four-phase partitioning model may be used to derive soil concentrations for any site where hazardous substances are present in the soil as a nonaqueous phase liquid (NAPL). The department expects that this model will be used at sites contaminated with petroleum hydrocarbons. Site-specific data are required for use of this model. See subsection (6) of this section.

(d) Leaching tests. Leaching tests may be used to establish soil concentrations for certain metals. Leaching tests may also be used to establish soil concentrations for other hazardous substances, including petroleum hydrocarbons, provided sufficient information is available to demonstrate that the leaching test can accurately predict ground water impacts. Testing of soil samples from the site is required for use of this method. See subsection (7) of this section.

(e) Alternative fate and transport models. Fate and transport models other than those specified in subsections (4) through (6) of this section may be used to establish a soil concentration for any hazardous substance. Site-specific data are required for use of such models. See subsection (8) of this section.

(f) Empirical demonstration. An empirical demonstration may be used to show that measured soil concentrations will not cause an exceedance of the applicable ground water cleanup levels established under WAC 173-340-720. This empirical demonstration may be used for any hazardous substance. Site-specific data (e.g., ground water samples and soil samples) are required under this method. If the required demonstrations cannot be made, then a protective soil concentration shall be established under one of the methods specified in subsections (4) through (8) of this section. See subsection (9) of this section.

(g) Residual saturation. To ensure that the soil concentration established under one of the methods specified in subsections (4) through (9) of this section will not cause an exceedance of the ground water cleanup level established under WAC 173-340-720, the soil concentration must not result in the accumulation of nonaqueous phase liquid (NAPL) on or in ground water. The methodologies and procedures specified in subsection (10) of this section shall be used to determine if this criterion is met.

WAC 173-340-747 (4) Fixed parameter three-phase partitioning model.

(a) Overview. This subsection specifies the procedures and requirements for establishing soil concentrations through the use of the fixed parameter three-phase partitioning model. The model may be used to establish soil concentrations for any hazardous substance. The model may be used to calculate both unsaturated and saturated zone soil concentrations.

This method provides default or fixed input parameters for the three-phase partitioning model that are intended to be protective under most circumstances and conditions; site-specific measurements are not required. In some cases it may be appropriate to use site-specific measurements for the input parameters. Subsection (5) of this section specifies the procedures and requirements to establish site-specific input parameters for use in the three-phase partitioning model.

(b) Description of the model. The three-phase partitioning model is described by the following equation:

[Equation 747-1]

Place illustration here.

Where:
Cs = Soil concentration (mg/kg)
Cw = Ground water cleanup level established under WAC 173-340-720 (ug/l)
UCF = Unit conversion factor (1mg/1,000 ug)
DF = Dilution factor (dimensionless: 20 for unsaturated zone soil; see (e) of this subsection for saturated zone soil)
Kd = Distribution coefficient (L/kg; see (c) of this subsection)
&thgr;w = Water-filled soil porosity (ml water/ml soil: 0.3 for unsaturated zone soil; see (e) of this subsection for saturated zone soil)
&thgr;a = Air-filled soil porosity (ml air/ml soil: 0.13 for unsaturated zone soil; see (e) of this subsection for saturated zone soil)
Hcc = Henry's law constant (dimensionless; see (d) of this subsection)
&rgr;b = Dry soil bulk density (1.5 kg/L)

(c) Distribution coefficient (Kd). The default Kd values for organics and metals used in Equation 747-1 are as follows:

(i) Organics. For organic hazardous substances, the Kd value shall be derived using Equation 747-2. The Koc (soil organic carbon-water partition coefficient) parameter specified in Equation 747-2 shall be derived as follows:

(A) Nonionic organics. For individual nonionic hydrophobic organic hazardous substances (e.g., benzene and naphthalene), the Koc values in Table 747-1 shall be used. For hazardous substances not listed in Table 747-1, Kd values may be developed as provided in subsection (5) of this section (variable three-phase partitioning model).

(B) Ionizing organics. For ionizing organic hazardous substances (e.g., pentachlorophenol and benzoic acid), the Koc values in Table 747-2 shall be used. Table 747-2 provides Koc values for three different pHs. To select the appropriate Koc value, the soil pH must be measured. The Koc value for the corresponding soil pH shall be used. If the soil pH falls between the pH values provided, an appropriate Koc value shall be selected by interpolation between the listed Koc values.

[Equation 747-2]
Kd = Koc x foc
Where:
Kd = Distribution coefficient (L/kg)
Koc = Soil organic carbon-water partitioning coefficient (ml/g). See (c)(i) of this subsection.
foc = Soil fraction of organic carbon (0.1% or 0.001 g/g)

(ii) Metals. For metals, the Kd values in Table 747-3 shall be used. For metals not listed in Table 747-3, Kd values may be developed as provided in subsection (5) of this section (variable three-phase partitioning model).

(d) Henry's law constant. For petroleum fractions, the values for Henry's law constant in Table 747-4 shall be used in Equation 747-1. For individual organic hazardous substances, the value shall be based on values in the scientific literature. For all metals present as inorganic compounds except mercury, zero shall be used. For mercury, either 0.47 or a value derived from the scientific literature shall be used. Derivation of Henry's law constant from the scientific literature shall comply with WAC 173-340-702 (14), (15) and (16).

(e) Saturated zone soil concentrations. Equation 747-1 may also be used to derive concentrations for soil that is located at or below the ground water table (the saturated zone). The following input parameters shall be changed if Equation 747-1 is used to derive saturated zone soil concentrations:

(i) The dilution factor shall be changed from 20 to 1;

(ii) The water-filled soil porosity value shall be changed from 0.3 ml water/ml soil to 0.43 ml water/ml soil; and

(iii) The air-filled soil porosity value shall be changed from 0.13 ml air/ml soil to zero.

WAC 173-340-747 (5) Variable parameter three-phase partitioning model.

(a) Overview. This section specifies the procedures and requirements to derive site-specific input parameters for use in the three-phase partitioning model. This method may be used to establish soil concentrations for any hazardous substance. This method may be used to calculate both unsaturated and saturated zone soil concentrations.

This method allows for the substitution of site-specific values for the default values in Equation 747-1 for one or more of the following five input parameters: Distribution coefficient, soil bulk density, soil volumetric water content, soil air content, and dilution factor. The methods that may be used and the requirements that shall be met to derive site-specific values for each of the five input parameters are specified in (b) through (f) of this subsection.

(b) Methods for deriving a distribution coefficient (Kd). To derive a site-specific distribution coefficient, one of the following methods shall be used:

(i) Deriving Kd from soil fraction of organic carbon (foc) measurements. Site-specific measurements of soil organic carbon may be used to derive distribution coefficients for nonionic hydrophobic organics using Equation 747-2. Soil organic carbon measurements shall be based on uncontaminated soil below the root zone (i.e., soil greater than one meter in depth) that is representative of site conditions or in areas through which contaminants are likely to migrate.

The laboratory protocols for measuring soil organic carbon in the Puget Sound Estuary Program (March, 1986) may be used. Other methods may also be used if approved by the department. All laboratory measurements of soil organic carbon shall be based on methods that do not include inorganic carbon in the measurements.

(ii) Deriving Kd from site data. Site-specific measurements of the hazardous substance concentrations in the soil and the soil pore water or ground water may be used, subject to department approval, to derive a distribution coefficient. Distribution coefficients that have been derived from site data shall be based on measurements of soil and ground water hazardous substance concentrations from the same depth and location. Soil and ground water samples that have hazardous substances present as a nonaqueous phase liquid (NAPL) shall not be used to derive a distribution coefficient and measures shall be taken to minimize biodegradation and volatilization during sampling, transport and analysis of these samples.

(iii) Deriving Kd from batch tests. A site-specific distribution coefficient may be derived by using batch equilibrium tests, subject to department approval, to measure hazardous substance adsorption and desorption. The results from the batch test may be used to derive Kd from the sorption/desorption relationship between hazardous substance concentrations in the soil and water. Samples that have hazardous substances present as a nonaqueous phase liquid (NAPL) shall not be used to derive a distribution coefficient and measures shall be taken to minimize biodegradation and volatilization during testing.

(iv) Deriving Kd from the scientific literature. The scientific literature may be used to derive a site-specific distribution coefficient (Kd) for any hazardous substance, provided the requirements in WAC 173-340-702 (14), (15) and (16) are met.

(c) Deriving soil bulk density. ASTM Method 2049 or other methods approved by the department may be used to derive soil bulk density values.

(d) Deriving soil volumetric water content using laboratory methods. ASTM Method 2216 or other methods approved by the department may be used to derive soil volumetric water content values.

(e) Estimating soil air content. An estimate of soil air content may be determined by calculating soil porosity and subtracting the volumetric water content.

(f) Deriving a dilution factor from site-specific estimates of infiltration and ground water flow volume. Site-specific estimates of infiltration and ground water flow volume may be used in the following equation to derive a site-specific dilution factor:

[Equation 747-3]
$DF = (Qp + Qa)/Qp$
Where:
DF = Dilution factor (dimensionless)
Qp = Volume of water infiltrating (m3/yr)
Qa = Ground water flow (m3/yr)

(i) Calculating ground water flow volume. The following equation shall be used under this method to calculate the volume of ground water flow (Qa):

[Equation 747-4]
$Qa = K \times A \times I$
Where:

Qa = Ground water flow volume (m3/year)
K = Hydraulic conductivity (m/year). Site-specific measurements shall be used to derive this parameter.
A = Aquifer mixing zone (m2). The aquifer mixing zone thickness shall not exceed 5 meters in depth and be equal to a unit width of 1 meter, unless it can be demonstrated empirically that the mixing zone thickness exceeds 5 meters.
I = Gradient (m/m). Site-specific measurements shall be used to derive this parameter.

(A) Equation 747-4 assumes the ground water concentrations of hazardous substances of concern upgradient of the site are not detectable. If this assumption is not true, the dilution factor may need to be adjusted downward in proportion to the upgradient concentration.

(B) Direct measurement of the flow velocity of ground water using methods approved by the department may be used as a substitute for measuring the ground water hydraulic conductivity and gradient.

(ii) Calculating or estimating infiltration. The following equation shall be used under this method to calculate the volume of water infiltrating (Qp):

[Equation 747-5]
Qp = L x W x Inf
Where:
Qp = Volume of water infiltrating (m3/year)
L = Estimated length of contaminant source area parallel to ground water flow (m)
W = Unit width of contaminant source area (1 meter)
Inf = Infiltration (m/year)

(A) If a default annual infiltration value (Inf) is used, the value shall meet the following requirements. For sites west of the Cascade Mountains, the default annual infiltration value shall be 70 percent of the average annual precipitation amount. For sites east of the Cascade Mountains, the default annual infiltration value shall be 25 percent of the average annual precipitation amount.

(B) If a site-specific measurement or estimate of infiltration (Inf) is made, it shall be based on site conditions without surface caps (e.g., pavement) or other structures that would control or impede infiltration. The presence of a cover or cap may be considered when evaluating the protectiveness of a remedy under WAC 173-340-350 through 173-340-360. If a site-specific measurement or estimate of infiltration is made, then it must comply with WAC 173-340-702 (14), (15) and (16).

WAC 173-340-747 (7) Leaching tests.

(a) **Overview.** This subsection specifies the procedures and requirements for deriving soil concentrations through the use of leaching tests. Leaching tests may be used to establish soil concentrations for the following specified metals: Arsenic, cadmium, total chromium, hexavalent chromium, copper, lead, mercury, nickel, selenium, and zinc (see (b) and (c) of this subsection). Leaching tests may also be used to establish soil concentrations for other hazardous substances, including petroleum hydrocarbons, provided sufficient information is available to correlate leaching test results with ground water impacts (see (d) of this subsection). Testing of soil samples fro... the site is required for use of this method.

(b) **Leaching tests for specified metals.** If leaching tests are used to establish soil concentrations for the specified metals, the following two leaching tests may be used:

(i) EPA Method 1312, Synthetic Precipitation Leaching Procedure (SPLP). Fluid #3 (pH = 5.0), representing acid rain in the western United States, shall be used when conducting this test. This test may underestimate ground water impacts when acidic conditions exist due to significant biological degradation or for other reasons. Underestimation of ground water impacts may occur, for example, when soils contaminated with metals are located in wood waste, in municipal solid waste landfills, in high sulfur content mining wastes, or in other situations with a pH <6. Consequently, this test shall not be used in these situations and the TCLP test should be used instead.

(ii) **EPA Method 1311, Toxicity Characteristic Leaching Procedure (TCLP).** Fluid #1 (pH = 4.93), representing organic acids generated by biological degradation processes, shall be used when conducting this test. This test is intended to represent situations where acidic conditions are present due to biological degradation such as in municipal solid waste landfills. Thus, it may underestimate ground water impacts where this is not the case and the metals of interest are more soluble under alkaline conditions. An example of this would be arsenic occurring in alkaline (pH >8) waste or soils. Consequently, this test shall not be used in these situations and the SPLP test should be used instead.

(c) **Criteria for specified metals.** When using either EPA Method 1312 or 1311, the analytical methods used for analysis of the leaching test effluent shall be sufficiently sensitive to quantify hazardous substances at concentrations at the ground water cleanup level established under WAC 173-340-720. For a soil metals concentration derived under (b) of this subsection to be considered protective of ground water, the leaching test effluent concentration shall meet the following criteria:

(i) For cadmium, lead and zinc, the leaching test effluent concentration shall be less than or equal to ten (10) times the applicable ground water cleanup level established under WAC 173-340-720.

(ii) For arsenic, total chromium, hexavalent chromium, copper, mercury, nickel and selenium, the leaching test effluent concentration shall be less than or equal to the applicable ground water cleanup level established under WAC 173-340-720.

ATTACHMENT C

WAC 173-201A-040

WAC 173-201A-040 Toxic substances. (1) Toxic substances shall not be introduced above natural background levels in waters of the state which have the potential either singularly or cumulatively to adversely affect characteristic water uses, cause acute or chronic toxicity to the most sensitive biota dependent upon those waters, or adversely affect public health, as determined by the department.

(2) The department shall employ or require chemical testing, acute and chronic toxicity testing, and biological assessments, as appropriate, to evaluate compliance with subsection (1) of this section and to ensure that aquatic communities and the existing and characteristic beneficial uses of waters are being fully protected.

(3) The following criteria shall be applied to all surface waters of the state of Washington for the protection of aquatic life. The department may revise the following criteria on a statewide or waterbody-specific basis as needed to protect aquatic life occurring in waters of the state and to increase the technical accuracy of the criteria being applied. The department shall formally adopt any appropriate revised criteria as part of this chapter in accordance with the provisions established in chapter 34.05 RCW, the Administrative Procedure Act. The department shall ensure there are early opportunities for public review and comment on proposals to develop revised criteria. Values are µg/L for all substances except Ammonia and Chloride which are mg/L:

	Freshwater		Marine Water	
Substance	Acute	Chronic	Acute	Chronic
Aldrin/Dieldrin	2.5a	0.0019b	0.71a	0.0019b
Ammonia (un-ionized NH3) hh	f,c	g,d	0.233h,c	0.035h,d
Arsenic dd	360.0c	190.0d	69.0c,ll	36.0d, cc,ll
Cadmium dd	i,c	j,d	42.0c	9.3d
Chlordane	2.4a	0.0043b	0.09a	0.004b
Chloride (Dissolved) k	860.0h,c	230.0h,d	-	-
Chlorine (Total Residual)	19.0c	11.0d	13.0c	7.5d
Chlorpyrifos	0.083c	0.041d	0.011c	0.0056d
Chromium (Hex) dd	15.0c,l,ii	10.0d,jj	1,100.0c ,l,ll	50.0d,ll
Chromium (Tri) gg	m,c	n,d	-	-
Copper dd	o,c	p,d	4.8c,ll	3.1d,ll
Cyanide ee	22.0c	5.2d	1.0c,m m	-
DDT (and metabolites)	1.1a	0.001b	0.13a	0.001b
Dieldrin/Aldrin e	2.5a	0.0019b	0.71a	0.0019b
Endosulfan	0.22a	0.056b	0.034a	0.0087b
Endrin	0.18a	0.0023b	0.037a	0.0023b
Heptachlor	0.52a	0.0038b	0.053a	0.0036b
Hexachlorocyclohexane (Lindane)	2.0a	0.08b	0.16a	-
Lead dd	q,c	r,d	210.0c,l l	8.1d,ll
Mercury s	2.1c,kk,d d	0.012d,ff	1.8c,ll,d d	0.025d,ff
Nickel dd	t,c	u,d	74.0c,ll	8.2d,ll
Parathion	0.065c	0.013d	-	-
Pentachlorophenol (PCP)	w,c	v,d	13.0c	7.9d
Polychlorinated Biphenyls (PCBs)	2.0b	0.014b	10.0b	0.030b
Selenium	20.0c,ff	5.0d,ff	290c,ll, dd	71.0d, x,ll,dd
Silver dd	y,a	-	1.9a,ll	-

Toxaphene	0.73c,z	0.0002d	0.21c,z	0.0002d
Zinc dd	aa,c	bb,d	90.0c,ll	81.0d,ll

Notes to Table:

a. An instantaneous concentration not to be exceeded at any time.

b. A 24-hour average not to be exceeded.

c. A 1-hour average concentration not to be exceeded more than once every three years on the average.

d. A 4-day average concentration not to be exceeded more than once every three years on the average.

e. Aldrin is metabolically converted to Dieldrin. Therefore, the sum of the Aldrin and Dieldrin concentrations are compared with the Dieldrin criteria.

f. Shall not exceed the numerical value given by:

$$0.52 \div (FT)(FPH)(2)$$

where: $FT = 10^{[0.03(20-TCAP)]}$; $TCAP \le T \le 30$

$FT = 10^{[0.03(20-T)]}$; $0 \le T \le TCAP$

$FPH = 1$; $8 \le pH \le 9$

$FPH = (1+ 10^{(7.4-pH)}) \div 1.25$; $6.5 \le pH \le 8.0$

$TCA = \frac{}{P}$ 20°C; Salmonids present.

$TCA = \frac{}{P}$ 25°C; Salmonids absent.

g. Shall not exceed the numerical value given by:

$$0.80 \div (FT)(FPH)(RATIO)$$

where: $RATIO = 13.5$; $7.7 \le pH \le 9$

$RATIO = (20.25 \times 10^{(7.7-pH)}) \div (1+ 10^{(7.4-pH)})$; $6.5 \le pH \le 7.7$

where: FT and FPH are as shown in (f) above except:

TCAP = 15°C; Salmonids present.

TCAP = 20°C; Salmonids absent.

h. Measured in milligrams per liter rather than micrograms per liter.

i. $\le (0.944)(e(1.128[\ln(\text{hardness})]-3.828))$ at hardness= 100. Conversion factor (CF) of 0.944 is hardness dependent. CF is calculated for other hardnesses as follows: CF= 1.136672 - [(ln hardness)(0.041838)].

j. $\le (0.909)(e(0.7852[\ln(\text{hardness})]-3.490))$ at hardness= 100. Conversions factor (CF) of 0.909 is hardness dependent. CF is calculated for other hardnesses as follows: CF= 1.101672 - [(ln hardness)(0.041838)].

k. Criterion based on dissolved chloride in association with sodium. This criterion probably will not be adequately protective when the chloride is associated with potassium, calcium, or magnesium, rather than sodium.

l. Salinity dependent effects. At low salinity the 1-hour average may not be sufficiently protective.

m. $\le (0.316)e^{(0.8190[\ln(\text{hardness})]+3.688)}$

n. $\le (0.860)e^{(0.8190[\ln(\text{hardness})]+1.561)}$

o. $\le (0.960)(e^{(0.9422[\ln(\text{hardness})]-1.464)})$

p. $\le (0.960)(e^{(0.8545[\ln(\text{hardness})]-1.465)})$

q. $\leq (0.791)(e^{(1.273[\ln(\text{hardness})] - 1.460)})$ at hardness= 100. Conversion factor (CF) of 0.791 is hardness dependent. CF is calculated for other hardnesses as follows: CF= 1.46203 - [(ln hardness)(0.145712)].

r. $\leq (0.791)(e^{(1.273[\ln(\text{hardness})] - 4.705)})$ at hardness= 100. Conversion factor (CF) of 0.791 is hardness dependent. CF is calculated for other hardnesses as follows: CF= 1.46203 - [(ln hardness)(0.145712)].

s. If the four-day average chronic concentration is exceeded more than once in a three-year period, the edible portion of the consumed species should be analyzed. Said edible tissue concentrations shall not be allowed to exceed 1.0 mg/kg of methylmercury.

t. $\leq (0.998)(e^{(0.8460[\ln(\text{hardness})] + 3.3612)})$

u. $\leq (0.997)(e^{(0.8460[\ln(\text{hardness})] + 1.1645)})$

v. $\leq e^{[1.005(\text{pH}) - 5.290]}$

w. $\leq e^{[1.005(\text{pH}) - 4.830]}$

x. The status of the fish community should be monitored whenever the concentration of selenium exceeds 5.0 ug/l in salt water.

y. $\leq (0.85)(e^{(1.72[\ln(\text{hardness})] - 6.52)})$

z. Channel Catfish may be more acutely sensitive.

aa. $\leq (0.978)(e^{(0.8473[\ln(\text{hardness})] + 0.8604)})$

bb $\leq (0.986)(e^{(0.8473[\ln(\text{hardness})] + 0.7614)})$

cc. Nonlethal effects (growth, C-14 uptake, and chlorophyll production) to diatoms (Thalassiosira aestivalis and Skeletonema costatum) which are common to Washington's waters have been noted at levels below the established criteria. The importance of these effects to the diatom populations and the aquatic system is sufficiently in question to persuade the state to adopt the USEPA National Criteria value (36 µg/L) as the state threshold criteria, however, wherever practical the ambient concentrations should not be allowed to exceed a chronic marine concentration of 21 µg/L.

dd These ambient criteria in the table are for the dissolved fraction. The cyanide criteria are based on the weak acid dissociable method. The metals criteria may not be used to calculate total recoverable effluent limits unless the seasonal partitioning of the dissolved to total metals in the ambient water are known. When this information is absent, these metals criteria shall be applied as total recoverable values, determined by back-calculation, using the conversion factors incorporated in the criterion equations. Metals criteria may be adjusted on a site-specific basis when data are made available to the department clearly demonstrating the effective use of the water effects ratio approach established by USEPA, as generally guided by the procedures in USEPA Water Quality Standards Handbook, December 1983, as supplemented or replaced. Information which is used to develop effluent limits based on applying metals partitioning studies or the water effects ratio approach shall be identified in the permit fact sheet developed pursuant to WAC 173-220-060 or 173-226-110, as appropriate, and shall be made available for the public comment period required pursuant to WAC 173-220-050 or 173-226-130(3), as appropriate.

ee. The criteria for cyanide is based on the weak and dissociable method in the 17th Ed. Standard Methods for the Examination of Water and Wastewater, 4500-CN I, and as revised (see footnote dd, above).

ff. These criteria are based on the total-recoverable fraction of the metal.

gg Where methods to measure trivalent chromium are unavailable, these criteria are to be represented by total-recoverable chromium.

hh Tables for the conversion of total ammonia to un-ionized ammonia for freshwater can be found in the USEPA's Quality Criteria for Water, 1986. Criteria concentrations based on total ammonia for marine water can be found in USEPA Ambient Water Quality Criteria for Ammonia (Saltwater)-1989, EPA440/5-88-004, April 1989.

ii. Conversion factor to calculate dissolved metal concentration is 0.982.

jj. Conversion factor to calculate dissolved metal concentration is 0.962.

ATTACHMENT E

WAC 173-340-7490 (February 15, 2001)

WAC 173-340-7490
Terrestrial ecological evaluation procedures.

(1) Purpose.
(a) WAC 173-340-7490 through 173-340-7494 define the goals and procedures the department will use for: (i) Determining whether a release of hazardous substances to soil may pose a threat to the terrestrial environment; (ii) Characterizing existing or potential threats to terrestrial plants or animals exposed to hazardous substances in soil; and (iii) Establishing site-specific cleanup standards for the protection of terrestrial plants and animals.
(b) Information collected during a terrestrial ecological evaluation shall also be used in developing and evaluating cleanup action alternatives and in selecting a cleanup action under WAC 173-340-350 through 173-340-390. WAC 173-340-7490 through 173-340-7494 do not necessarily require a cleanup action for terrestrial ecological protection separate from a human health-based cleanup action. Where appropriate, a terrestrial ecological evaluation may be conducted so as to avoid duplicative studies of soil contamination that will be remediated to address other concerns, as provided in WAC 173-340-350 (7)(c)(iii)(F)(II).
(c) These procedures are not intended to be used to evaluate potential threats to ecological receptors in sediments, surface water, or wetlands. Procedures for sediment evaluations are described in WAC 173-340-760, and for surface water evaluations in WAC 173-340-730. Procedures for wetland evaluations shall be determined by the department on a case-by-case basis.

(2) Requirements. In the event of a release of a hazardous substance to the soil at a site, one of the following actions shall be taken:
(a) Document an exclusion from any further terrestrial ecological evaluation using the criteria in WAC 173-340-7491;
(b) Conduct a simplified terrestrial ecological evaluation as set forth in WAC 173-340-7492; or
(c) Conduct a site-specific terrestrial ecological evaluation as set forth in WAC 173-340-7493.

(3) Goal. The goal of the terrestrial ecological evaluation process is the protection of terrestrial ecological receptors from exposure to contaminated soil with the potential to cause significant adverse effects. For species protected under the Endangered Species Act or other applicable laws that extend protection to individuals of a species, a significant adverse effect means an impact that would significantly disrupt normal behavior patterns that include, but are not limited to, breeding, feeding, or sheltering. For all other species, significant adverse effects are effects that impair reproduction, growth or survival.
(a) The simplified terrestrial ecological evaluation process has been developed to be protective of terrestrial ecological receptors at most qualifying sites, while the site-specific terrestrial ecological evaluation process is intended to be highly likely to be protective at any site.
(b) The following policy on terrestrial ecological receptors to be protected applies to all terrestrial ecological evaluations. For land uses other than industrial or commercial, protectiveness is evaluated relative to terrestrial plants, wildlife, and ecologically important functions of soil biota that affect plants or wildlife.
For industrial or commercial properties, current or future potential for exposure to soil contamination need only be evaluated for terrestrial wildlife protection. Plants and soil biota need not be considered unless:
(i) The species is protected under the federal Endangered Species Act; or
(ii) The soil contamination is located on an area of an industrial or commercial property where vegetation must be maintained to comply with local government land use regulations.
(c) For the purposes of this section, "industrial property" means properties meeting the definition in WAC 173-340-200. "Commercial property" means properties that are currently zoned for commercial property use and that are characterized by or are committed to traditional commercial uses such as offices, retail and wholesale sales, professional services, consumer services, and, warehousing.
(d) Any terrestrial remedy, including exclusions, based at least in part on future land use assumptions shall include a completion date for such future development acceptable to the department.

(4) Point of compliance.
(a) Conditional point of compliance. For sites with institutional controls to prevent excavation of deeper soil, a conditional point of compliance may be set at the biologically active soil zone. This zone is assumed to extend to a depth of six feet. The department may approve a site-specific depth based on a demonstration that an alternative depth is more appropriate for the site. In making this demonstration, the following shall be considered:
(i) Depth to which soil macro-invertebrates are likely to occur;

(ii) Depth to which soil turnover (bioturbation) is likely to occur due to the activities of soil invertebrates;
(iii) Depth to which animals likely to occur at the site are expected to burrow; and
(iv) Depth to which plant roots are likely to extend.
(b) **Standard point of compliance.** An institutional control is not required for soil contamination that is at least fifteen feet below the ground surface. This represents a reasonable estimate of the depth of soil that could be excavated and distributed at the soil surface as a result of site development activities, resulting in exposure by ecological receptors.

(5) **Additional measures.** The department may require additional measures to evaluate potential threats to terrestrial ecological receptors notwithstanding the provisions in this and the following sections, when based upon a site-specific review, the department determines that such measures are necessary to protect the environment.

Table 749-2

Priority Contaminants of Ecological Concern for sites that Qualify for the Simplified Terrestrial Ecological Evaluation Procedure.[a]

Priority contaminant	Soil concentration (mg/kg)	
	Unrestricted land use[b]	Industrial or commercial site
METALS[c]		
Antimony	See note d	See note d
Arsenic III	20 mg/kg	20 mg/kg
Arsenic V	95 mg/kg	260 mg/kg
Barium	1,250 mg/kg	1,320 mg/kg
Beryllium	25 mg/kg	See note d
Cadmium	25 mg/kg	36 mg/kg
Chromium (total)	42 mg/kg	135 mg/kg
Cobalt	See note d	See note d
Copper	100 mg/kg	550 mg/kg
Lead	220 mg/kg	220 mg/kg
Magnesium	See note d	See note d
Manganese	See note d	23,500 mg/kg
Mercury, inorganic	9 mg/kg	9 mg/kg
Mercury, organic	0.7 mg/kg	0.7 mg/kg
Molybdenum	See note d	71 mg/kg
Nickel	100 mg/kg	1,850 mg/kg
Selenium	0.8 mg/kg	0.8 mg/kg
Silver	See note d	See note d
Tin	275 mg/kg	See note d
Vanadium	26 mg/kg	See note d
Zinc	270 mg/kg	570 mg/kg
PESTICIDES		
Aldicarb/aldicarb sulfone (total)	See note d	See note d
Aldrin	0.17 mg/kg	0.17 mg/kg
Benzene hexachloride (including lindane)	10 mg/kg	10 mg/kg
Carbofuran	See note d	See note d
Chlordane	1 mg/kg	7 mg/kg
Chlorpyrifos/chlorpyrifos-methyl (total)	See note d	See note d
DDT/DDD/DDE (total)	1 mg/kg	1 mg/kg
Dieldrin	0.17 mg/kg	0.17 mg/kg
Endosulfan	See note d	See note d
Endrin	0.4 mg/kg	0.4 mg/kg
Heptachlor/heptachlor epoxide (total)	0.6 mg/kg	0.6 mg/kg
Hexachlorobenzene	31 mg/kg	31 mg/kg
Parathion/methyl parathion (total)	See note d	See note d
Pentachlorophenol	11 mg/kg	11 mg/kg
Toxaphene	See note d	See note d

OTHER CHLORINATED ORGANICS		
Chlorinated dibenzofurans (total)	3E-06 mg/kg	3E-06 mg/kg
Dioxins (total)	5E-06 mg/kg	5E-06 mg/kg
Hexachlorophene	See note d	See note d
PCB mixtures (total)	2 mg/kg	2 mg/kg
Pentachlorobenzene	168 mg/kg	See note d
OTHER NONCHLORINATED ORGANICS		
Acenaphthene	See note d	See note d
Benzo(a)pyrene	30 mg/kg	300 mg/kg
Bis (2-ethylhexyl) phthalate	See note d	See note d
Di-n-butyl phthalate	200 mg/kg	See note d
PETROLEUM		
Gasoline Range Organics	200 mg/kg	12,000 mg/kg except that the concentration shall not exceed residual saturation at the soil surface.
Diesel Range Organics	460 mg/kg	15,000 mg/kg except that the concentration shall not exceed residual saturation at the soil surface.

Footnotes:

a Caution on misusing these chemical concentration numbers. These values have been developed for use at sites where a site-specific terrestrial ecological evaluation is not required. They are not intended to be protective of terrestrial ecological receptors at every site. Exceedances of the values in this table do not necessarily trigger requirements for cleanup action under this chapter. The table is not intended for purposes such as evaluating sludges or wastes. This list does not imply that sampling must be conducted for each of these chemicals at every site. Sampling should be conducted for those chemicals that might be present based on available information, such as current and past uses of chemicals at the site.

b Applies to any site that does not meet the definition of industrial or commercial.

c For arsenic, use the valence state most likely to be appropriate for site conditions, unless laboratory information is available. Where soil conditions alternate between saturated, anaerobic and unsaturated, aerobic states, resulting in the alternating presence of arsenic III and arsenic V, the arsenic III concentrations shall apply.

d Safe concentration has not yet been established.

kk Conversion factor to calculate dissolved metal concentration is 0.85.

ll. Marine conversion factors (CF) used for calculating dissolved metals concentrations. Conversion factors are applicable to both acute and chronic criteria for all metals except mercury. CF for mercury is applicable to the acute criterion only. Conversion factors are already incorporated into the criteria in the table. Dissolved criterion= criterion x CF

Metal	CF
Arsenic	1.000
Cadmium	0.994
Chromium (VI)	0.993
Copper	0.83
Lead	0.951
Mercury	0.85
Nickel	0.990
Selenium	0.998
Silver	0.85
Zinc	0.946

m The cyanide criteria are: 9.1µg/l chronic and 2.8µg/l acute and are applicable only to waters which are east of a line from
m. Point Roberts to Lawrence Point, to Green Point to Deception Pass; and south from Deception Pass and of a line from Partridge Point to Point Wilson.

(4) USEPA Quality Criteria for Water, 1986 shall be used in the use and interpretation of the values listed in subsection (3) of this section.
(5) Concentrations of toxic, and other substances with toxic propensities not listed in subsection (3) of this section shall be determined in consideration of USEPA Quality Criteria for Water, 1986, and as revised, and other relevant information as appropriate. Human health-based water quality criteria used by the state are contained in 40 CFR 131.36 (known as the National Toxics Rule).
(6) Risk-based criteria for carcinogenic substances shall be selected such that the upper-bound excess cancer risk is less than or equal to one in one million.
[Statutory Authority: Chapter 90.48 RCW and 40 CFR 131. 97-23-064 (Order 94-19), § 173-201A-040, filed 11/18/97, effective 12/19/97. Statutory Authority: Chapter 90.48 RCW. 92-24-037 (Order 92-29), § 173-201A-040, filed 11/25/92, effective 12/26/92.]
NOTES:

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency.

of the eight RCRA metals (Attachment E). These concentrations are developed to protect wildlife through direct ingestion of soil using a robin/shrew food chain model, two surrogate receptors meant to represent highly exposed species. Soil concentrations were also developed for plants and soil invertebrates using toxicity values from the published literature. The most restrictive value was then placed into Table 749-2.

Generally, the Method A concentrations are less than or similar to Table 749-2 (see Table 1). However, the MTCA Method A standards list does not include values for barium, total chromium or selenium. For these constituents, the Table 749-2 ecological standards listed in Table 1 (adjusted for background and PQLs) will be used as screening criteria for the top three feet of embankment fill.

3. **The Port of Seattle will monitor the seepage water from the rock underdrain for contaminants. Monitoring shall be for a period of 10 years, on a monthly basis. Based on the monitoring results, the monitoring schedule may be modified by FWS.**

The Port of Seattle shall prepare a water quality monitoring plan to track the quality of seepage from the drainage layer beneath the Third Runway embankment fill. Such a plan shall be prepared to address the amount of monitoring in a tiered or phased approach. For example, if it is determined that water flowing through the new embankment is exceeding designated surface water quality criteria, new monitoring points may be established between the embankment and Miller Creek to evaluate the fate and transport of the impacted fill water. Monitoring Miller Creek would represent the final phase of a monitoring program if it were determined that constituents in embankment fill water were reaching the creek. The Port shall develop a monitoring plan in consultation with FWS. The Port shall submit a draft monitoring plan to FWS for its review and approval within 120 days after FWS' issuance of a biological opinion or concurrence letter. The monitoring plan shall provide for a minimum of three years of monthly monitoring, with the monitoring period commencing upon detection of seepage from the drainage layer of the completed embankment. At the end of the three-year monitoring period, the Port and FWS shall reevaluate the need to modify or continue the monitoring program. In the event seepage is not detected within six years after completion of embankment construction, the Port and FWS shall likewise reevaluate the need to modify or continue the monitoring program. In the event monitoring detects unforeseen adverse impacts to aquatic life in the project area, the Port shall reinitiate consultation as appropriate and implement measures to address such impacts.

4, 5. **If material is used which is known to have contaminants, this material shall be distributed over a large area to avoid creating a "hot spot" in the embankment. The Port of Seattle will request FWS approval for those fill materials proposed that do not meet MTCA Method A standards, at a minimum. Information on why these materials are to be used and proof that their chemical constituents/levels will not result in environmental impacts to aquatic organisms needs to be provided.**

The use of MTCA Method A as a screening standard for incoming fill material will avoid the creation of "hot spots" in the embankment. In the event that the Port

from numerous sources in the region. Thus, in column 7, a range of screening criteria between background levels, when available, and Method A standards is shown. In the event the Port desires to establish site-specific background criteria, it will discuss proposed criteria with FWS and reinitiate consultation as appropriate. If the suppliers wish to place soil in the drainage cover layer that exceed background concentrations, the Port will confirm the acceptability of the material by requiring suppliers using that source to conduct sufficient SPLP testing to show that Method A criteria are protective of baseline conditions for surface water receptors.

(iv) To confirm the protectiveness of the Method A standards and the Three Phase Partitioning Model, SPLP testing will be used as a laboratory method to ensure that leaching of metals through potential embankment soil will not occur at unacceptable levels. SPLP testing according to the procedures contained in WAC 173-340-747(7) and SPLP methodology are shown in Attachments B and D respectively. SPLP results will be compared, as an initial screening tool, to freshwater ambient water quality criteria according to guidelines outlined at WAC 173-201A-040 (Attachment C). If the SPLP results indicate that metals in the proposed fill material *do not leach* at levels above the freshwater ambient water quality criteria, adjusted for PQLs as appropriate, the material will be considered suitable for placement. If the SPLP indicates that metals in the proposed fill material *leach* at levels above ambient water quality criteria, the Port will either reject the material ~~or discuss the results of the SPLP with~~ or obtain FWS' approval before acceptance of the material ~~.~~ through a reinitiated consultation. The Port shall submit to FWS for its review and approval a plan describing the Port's SPLP protocol. The FWS shall approve this plan prior the Port's implementation of the SPLP protocol.

(c) Organochlorines: The Port will employ the following standards and protocols concerning the placement of fill in the drainage layer cover:

(i) The Port will require testing for organochlorines on those sites where such compounds may be present, including sites with potential commercial pesticide applications, and sites with historic wood preserving operations. The supplier, with Port review, will identify sites potentially containing such compounds through the process discussed above under Response 1 (i.e., Phase I and II Environmental Site Assessments). The Port will update guidelines provided to suppliers to clearly state that testing for additional constituents must be conducted as appropriate based on current and historical site land uses.

(ii) As with the remainder of the embankment fill, sources of fill proposed for placement in the drainage layer cover which have detectable levels of organochlorines will not exceed MTCA Method A criteria.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

May 31, 2001

Lowell H. Johnson
Manager, Airport Division
Federal Aviation Administration
1601 Lind Avenue S.W.
Renton, Washington 98055-4056

Re: Biological Assessment for Master Plan Update Improvements at Seattle-Tacoma International Airport (NMFS No. WSB-00-318) and Essential Fish Habitat consultation

Dear Mr. Johnson:

On June 16, 2000, the National Marine Fisheries Service (NMFS) received a Biological Assessment (BA) from the Federal Aviation Administration (FAA) on behalf of the Port of Seattle (Port). The Port is FAA's designated non-federal representative for this consultation. The BA considered numerous construction projects included in the Master Plan Update Improvements for Seattle-Tacoma International Airport (STIA). FAA requested consultation under the Endangered Species Act (Sec 7(a)(2)) for chinook salmon (*Onchorhynchus tshawytscha*). The Port is the proponent of the STIA projects but FAA provides partial funding for the action, thus creating a Federal nexus and the need for section 7 consultation. This consultation covers federal actions that are required to implement STIA projects including: 1) FAA funding of airport improvements, 2) FAA construction of a control tower and navigational aids, 3) Issuance of a 404 permit by the Corps of Engineers (COE) as required by the Federal Clean Water Act. The BA also addressed the effects of STIA projects on Essential Fish Habitat (EFH) of coastal pelagic species and West Coast groundfish as required by Section 305(b) of the Magnuson-Stevens Act. EFH for Coho salmon (*O. kisutch*), a candidate species in Puget Sound, was not considered in this consultation although an independent assessment of EFH for coho was prepared by the Port and delivered to NMFS on March 27, 2001.

The BA concludes that STIA projects "may affect," but are "not likely to adversely affect" chinook salmon and that construction and operation of the projects "may affect" but is "not likely to destroy or adversely modify" designated critical habitat. The BA also concludes that STIA projects are "not likely to adversely affect" any identified EFH for the coastal pelagic species and West Coast Groundfish.

ENDANGERED SPECIES ACT

This consultation is based upon the BA (June 2000) and supplemental information that was formally transmitted to NMFS by FAA or the Port. These submittals include: Supplement for Property Acquisition and Demolition for 34X Runway Protection Zone (September 11, 2000), Clean Water Act Section 404 Permit Application (October 30, 2000), Supplement to the BA

(December 14, 2000) as well as Sea-Tac Runway Fill Hydrology Studies Report (PGG 2000), Seattle-Tacoma Airport Master Plan Update, Low Streamflow Analysis (Earth Tech, Inc. 2000) and Comprehensive Stormwater Management Plan (Parametrix 2000) submitted in January, 2001. In addition numerous telephone conversations and e-mail messages have transmitted information between NMFS, the Port and Parametrix, the Port's environmental consultant. The final document required to initiate formal consultation, a response to concerns raised by the Fish and Wildlife Service (FWS) about potential contamination in the embankment fill, was submitted on 26 March 2001 and modified on 30 March 2001.

Scientific consultants retained by the Airport Communities Coalition (ACC) also reviewed the above documents and provided extensive comments for NMFS evaluation during the consultation process.

The NMFS concurs with the effects determination of "may affect not likely to adversely affect" freshwater or marine life stages of threatened Puget Sound chinook salmon or designated critical habitat. Additionally, construction and operation of the STIA projects are "not likely to adversely affect" EFH for coastal pelagic species or West Coast Groundfish.

Project Location and Description

Most STIA projects are located within the cities of SeaTac and Des Moines, King County, Washington (Sections 4 and 5, Township 22 North, Range 4 East, and Sections 20, 21, 28, 29, 32, and 33, Township 23 North, Range 4 East, Willamette Meridian). Off-site wetland mitigation will occur in the City of Auburn, King County, Washington (Section 31, Township 22 North, Range 5 East, Willamette Meridian).

STIA projects will develop portions of property located on and near the existing Sea-Tac airport, and provide wetland mitigation near the Green River in the City of Auburn. The principal objectives of these actions are: 1) to provide a new 8,500 foot air carrier runway, 2) to provide a 600 foot extension to an existing runway, 3) to extend runway safety areas to meet existing FAA safety standards, 4) to upgrade existing facilities at SEA-TAC airport. Construction is scheduled for completion in 2010.

STIA projects (Table 1) include: the construction of runways, taxiways, borrow areas and runway safety areas (RSAs); installation of FAA and navigation aids (e.g., the new Airport Traffic Control Tower, airport surveillance radar [ASR], and airport surface detection equipment [ASDE]); improvements to airfield buildings, terminal and air cargo areas, roads, parking, the South Aviation Support Area (SASA), stormwater management facilities and the Industrial Wastewater System (IWS) facilities; and acquisition and demolition of existing structures. Proposed actions also include the relocation of approximately a 980-foot reach of Miller Creek as well as the development of avian habitat at a mitigation site near the Green River in Auburn.

The "action area" for these actions is the locations where STIA project construction will occur and the surrounding vicinity where direct and indirect effects could reasonably be expected to occur. This includes the aquatic habitat of Miller, Walker (a tributary to Miller), Des Moines, and Gilliam creeks downstream of the airport and the associated estuaries of Miller and Des Moines Creeks. The area surrounding the Midway Sewer District outfall in Puget Sound is

considered to be part of the action area because effluent from the Industrial Wastewater System is released to the Midway Sewer District. The Auburn wetland mitigation site and vicinity, where indirect effects could reasonably occur, are also included in the action area.

Status of the Species and Critical Habitat

The NMFS assessment of the effects of an action involves the initial steps of defining the biological requirements and current status of the listed species, and evaluating the relevance of the environmental baseline to the species' current status.

The status review of west coast chinook salmon populations defined 15 Evolutionarily Significant Units (ESUs) in Washington, Oregon, Idaho, and California, including the Puget Sound ESU (Myers et al. 1998). Chinook salmon in the Puget Sound ESU have declined substantially from historic levels due to the effects of hatchery supplementation on genetic fitness of stocks, severely degraded spawning and rearing habitats throughout the area, and harvest exploitation rates exceeding 90 percent for some Puget Sound chinook stocks. Puget Sound chinook were designated as threatened in March 1999 (NMFS 1999a)

Chinook salmon from the Puget Sound region consist largely of summer and fall run stocks, with juveniles that typically migrate to the marine environment during their first year of life (Myers et al. 1998). These "ocean-type" chinook rear in freshwater a few months or less, and most of their rearing occurs in the nearshore marine environment. Generally, ocean-type chinook migrate downstream in the spring, within months after emergence, or during the summer and autumn after a brief period of rearing in fresh water (Healey 1991; Myers et al. 1998). In Puget Sound, subyearling chinook salmon smolts typically migrate near the shoreline then move offshore as they grow in size. Yearling chinook smolts, that are typically produced by spring run adults and are uncommon in the project area, would spend less time near the shoreline of Puget Sound. Chinook juveniles may reside in the Puget Sound region until at least November before migrating to the North Pacific Ocean (Hartt and Dell 1986). Mature chinook salmon return to their natal rivers predominately as three-, four- and five-year-olds.
Juvenile chinook salmon feed opportunistically in Puget Sound. They consume large zooplankton, such as euphausiids and large copepods, amphipods, juvenile shrimp, and larval fishes (e.g., herring and sandlance) (Miller et al. 1977; Fresh et al. 1979, Simenstad et al. 1982). In areas where riparian habitat is abundant near the Sound, terrestrial insects can be an important prey item for juveniles up to 75 mm or so. Larger chinook will typically consume larger prey and the proportion of fish in the diet increases with size.

Chinook salmon that are present in the action area will most likely be from either the Green/Duwamish River (for the off-site mitigation action area and Gilliam creek) or the Puyallup River (for the estuaries of Miller and Des Moines creeks) stocks. The Duwamish/Green stock is considered to be healthy (WDFW 1993). The status of the Puyallup River stock was considered to be uncertain by WDFW (1993). Population trends for each stock is reported (Myers et al 1998) to be increasing gradually (1-5%).

Critical habitat for Puget Sound chinook salmon was designated in February 2000 (NMFS 2000) and includes all Puget Sound waters, estuaries, and freshwater habitats accessible to Puget Sound chinook salmon. Due to the complex life histories of salmonid species, habitats must be available for juvenile rearing, juvenile migration corridors, growth and development to adulthood, adult migration corridors and spawning. Major river basins that support this ESU include the Nooksack, Skagit, Stillaguamish, Snohomish, Green/Duwamish, Puyallup, Nisqually, Skokomish, Dungeness, Cedar, and Elwha Rivers. Critical habitat for threatened Puget Sound chinook salmon in the Duwamish hydrologic units is limited to habitat downstream from the Howard Hansen Dam. Major bays and estuarine/marine areas providing critical habitat to this ESU include the South Sound, Hood Canal, Elliott Bay, Possession Sound, Admiralty Inlet, Saratoga Passage, Rosario Strait, Strait of Georgia, Haro Strait, and the Strait of Juan De Fuca.

No threatened Puget Sound chinook salmon occur in Miller, Walker or Des Moines Creeks. There is no documented historical usage of Miller or Walker Creeks by chinook salmon. Recent surveys confirm that coho and chum salmon spawn in Miller creek but did not observe any chinook salmon. These surveys found a general lack of clean, unembedded gravel of a suitable size for chinook spawning, and a general lack of pools and instream cover for rearing. The specific physical characteristics of the stream do not provide appropriate habitat for spawning or rearing of chinook salmon. Consequently, there is no critical habitat present in Miller or Walker Creeks upstream of the estuary.

Des Moines Creek also lacks suitable habitat for chinook salmon spawning and rearing and was not used historically by chinook. Although nearly 75,000 juvenile chinook were released in Des Moines Creek between 1990 and 1993 (Myers et al 1998), there is no documented return of adults. Because few anadromous fish are able to pass the culvert beneath Marine View Drive, adult spawners would have been concentrated in the creek's lower 0.4 mile and evident to users of Des Moines Beach Park. Coho and chum salmon as well as cutthroat and steelhead trout occur in the lower reaches of Des Moines creek.

Given these considerations, the freshwater portion of Miller and Des Moines Creeks is not critical habitat for chinook salmon. The only critical habitat in either basin is located at the estuarine mouths of each creek. These areas may provide habitat for juvenile and adult migration. During the summer of 2000, the King County Department of Natural Resources conducted a pilot study to evaluate the use of nearshore marine areas by all species of juvenile salmonids. The collected samples between June and August at eight sites including Miller Creek using beach seines. On the nearshore marine beaches near Miller Creek they obtained

approximately 0.5 fish per seine haul, lower population densities than were reported for other sites in their study area. These data suggest that the nearshore area around Miller Creek, and probably at Des Moines Creek, do not p· ide significant marine rearing habitat for Puget Sound chinook salmon.

The wetland mitigation site and Gilliam Creek are located in the Green/Duwamish River Basin. Development of the 482 mi^2 Green/Duwamish watershed has resulted in a variety of changes to the basin's suitability for salmonids. This development includes the diversion of Black and White rivers during the early 1900s, construction of Howard Hansen Dam (RM 64) that blocks access to significant habitat upstream, diking of the mainstem below RM 38, forest practices, agriculture, urbanization, and industrialization in the lower Duwamish River. Of the original Green/Duwamish estuary, 97 percent has been filled; 70 percent of its original flow has been diverted to other basins, and 90 percent of the original floodplain is no longer flooded on a regular basis (USEPA 2000a). The city of Tacoma diverts flows in the upper watershed for use as a municipal water supply. The middle portion of the basin remains primarily rural; however, agriculture has increased sediments and nutrients in the river, degrading water quality as well as salmon spawning and rearing habitats. The lower reaches are becoming increasingly urbanized. The tidally influenced Duwamish Waterway has been extensively dredged and channelized for maritime use by the Port of Seattle and private industry. Despite these significant anthropogenic alterations, chinook salmon and other anadromous salmonids (coho, chum, steelhead) use the Green/Duwamish for spawning, rearing and migration. The BA indicates that chinook and other salmon spawn in the Green River, within several hundred feet of the wetland mitigation site. Therefore, this portion of the Green River is critical habitat for threatened Puget Sound chinook salmon.

Gilliam Creek is a small creek that is a tributary to the Green River and discharges to the Green River in the vicinity of the city of Tukwila. This creek discharges to that part of the Green River used for migration by returning adults and outmigrating juveniles. Gilliam Creek is used primarily by resident fish because culverts limit adult salmonid access to this tributary. Gilliam creek has been impacted by development; it is extensively culverted and receives stormwater runoff that causes high peak flows and low base flows. The lack of spawning gravel and appropriate flow conditions for chinook makes it very unlikely that adult chinook salmon will use Gilliam Creek for spawning. During the winter and spring months, juvenile salmon could be rearing in the area where Gilliam Creek discharges to the Green River. One juvenile salmon observed in Gilliam creek in February 1997 was recorded s a chinook by Ryan Partee, a fisheries biologist employed by the City of Tukwila. Thatnfish apparently entered Gilliam creek because the flap gate located at the confluence of Gilliam creek and the Green River was partially open. The occurrence of chinook salmon in Gilliam Creek is a rare event. Entering Gilliam Creek may impede outmigration of juvenile salmonids and because the flap gate restricts flow and may limit return to the Green River for outmigration. Proposed restoration projects in Gilliam Creek and removal of the flap gate may increase the value of Gilliam Creek for chinook rearing habitat, although the stream will still be impacted by urban development unrelated to STIA.

The IWS outfall is located in Puget Sound 1,800 ft offshore and in 170 ft of water. This area is critical habitat and represents a migration corridor for returning adult chinook salmon. No juvenile chinook will be present at this depth.

Effects Determination

Guidance for making determinations of effects are contained in The Habitat Approach, Implementation of Section 7 of the Endangered Species Act for Actions Affecting the Habitat of Pacific Anadromous Salmonids, (NMFS 1999b). The NMFS' critical habitat analysis considers the extent to which the proposed action impairs the function of essential elements necessary for migration, spawning, incubation and rearing of the listed salmon under the existing environmental baseline.

Not likely to adversely affect (NLAA) is the appropriate conclusion when effects on listed species are expected to be discountable, or insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs (USFWS/NMFS 1998). Discountable effects are those so extremely unlikely to occur that a reasonable person would not be able to meaningfully measure, detect or evaluate it (NMFS 1999b). This level of effect requires informal consultation, which consists of NMFS concurrence with the action agency's determination.

NMFS has related the biological requirements for listed salmonids to a number of habitat attributes, or pathways, in the Matrix of Pathways and Indicators (MPI). These pathways (Water Quality, Habitat Access, Habitat Elements, Channel Condition and Dynamics, Flow/hydrology, Watershed Conditions, Disturbance History, and Riparian Reserves) indirectly measure the baseline biological health of listed salmon populations through the health of their habitat. Specifically, each pathway is made up of a series of individual indicators (e.g. indicators for Water Quality include Temperature, Sediment, and Chemical Contamination.) that are measured or described directly (NMFS 1996). Based on the measurement or description, each indicator is classified within the properly functioning condition (PFC) framework as: 1) properly functioning, 2) at risk, or 3) not properly functioning. Properly functioning condition is defined as "the sustained presence of natural habitat forming processes in a watershed that are necessary for the long-term survival of the species through the full range of environmental variation."

The BA included MPIs for Miller Creek, the Miller Creek estuary, Des Moines Creek, the Des Moines Creek estuary and the Green River near the Auburn mitigation site. The MPI for Gilliam Creek was submitted, in response to a request from NMFS, on 2 November 2000. For Miller, DesMoines and Gilliam creeks nearly all indicators are considered to be "not properly functioning" and none were "properly functioning". Habitat conditions in the estuaries are somewhat better than upstream habitat conditions, generally being classified as "at risk" rather than "not properly functioning". However, the estuaries have been seriously altered by riprap

along the channel and filling of tidelands that limits total benthic production in the estuaries. All habitat conditions in the Green River were classified as "at risk" except for refugia which was considered to be "not properly functioning" because of lack of off channel habitat for rearing juveniles.

STIA projects will have temporary and long-term impacts to the aquatic habitat in Miller, Walker, and Des Moines Creeks. Less substantial impacts are expected to occur in Gilliam Creek, the estuaries of Miller and Des Moines Creeks, the outfall of the Midway Sewer District and in the Green River during construction of the offsite mitigation wetland. Potential impacts include changes in water quality, alterations to hydrologic conditions and alterations to wetland and stream habitats. Numerous conservation measures are proposed to reduce and minimize potential adverse impacts.

Since there are no chinook salmon, or critical habitat for chinook salmon, in Miller, Walker or Des Moines Creeks, STIA projects in these watersheds will have no direct effects to threatened Puget Sound chinook. The only potential indirect effects will occur in the estuaries of Miller and Des Moines Creeks and are expected to be insignificant or discountable. Effects of STIA projects are also insignificant or discountable for Gilliam Creek, the Midway Sewer outfall and the Green River. Consequently, NLAA is the appropriate determination for the project. The NMFS has completed a detailed evaluation of these projects in case reinitiation of consultation will be required in the future.

Water quality: Miller, Walker and Des Moines Creeks could potentially be affected by STIA projects due to construction activities and permanent additions of impervious surface that could lead to additional sediments and contaminants in stormwater runoff. Contaminants include conventional pollutants associated with urban type development, ground and aircraft de-icing activities, and discharge of effluent from the IWS system. There is also concern that contaminants from the embankment fill may leach into downstream wetlands and streams.

In Washington State protection of water quality protection is regulated by the Washington State Department of Ecology (DOE) under the Federal Water Pollution Control Act, also known as the Clean Water Act, and the Washington Water Pollution Control Act. The Clean Water Act is designed to protect the "chemical, physical, and biological integrity of the Nation's waters" and is implemented through Section 401, Section 402 (the National Pollutant Discharge Elimination System [NPDES]) and Section 404 (addressing fill and the waters of the United States). According to DOE, the conditions of the NPDES permit "constitutes compliance with the Federal Water Pollution Control Act.and the Washington Water Pollution Control Act (RCW 90.48)." NMFS has not consulted with EPA on impacts of water quality standards to threatened and endangered species. However, restrictions imposed in the past by the NPDES permits have improved the water quality of stormwater discharged by the Port. Conditions imposed by DOE for the NPDES permit include: 1) Effluent limitations based on the more stringent of either technology- or water quality-based limits; 2) A stormwater pollution prevention plan (SWPPP)

that identifies source control and treatment best management practices (BMPs); 3) Routine water quality and toxicity monitoring for STIA stormwater outfalls and IWS discharge, and reporting of these results to Ecology and; 4) Evaluation of pollution sources and BMP effectiveness via self-inspection and monitoring results.

The Port has proposed numerous BMPs to reduce and minimize water quality effects including pollutant source control, water quality treatment and enhancement of wetland and stream water quality functions. Past monitoring programs identified the need for specific BMPs to reduce or eliminate identified or potential water quality impacts. This adaptive management approach will continue to be used to identify additional BMPs for new, existing, and redeveloped areas at STIA. Thus, the quality of stormwater discharge should improve as new technologies are developed or specific sources of contamination are identified.

Changes on the landscape due to removal of vegetation, excavation and grading during construction could contribute to increased turbidity and sedimentation in the receiving waters. The Port will utilize BMPs (eg. Temporary and permanent cover practices, erosion control and sediment retention) and a stormwater treatment system during construction to reduce potential impacts. Demonstration projects to date indicate that treated discharge water meets applicable water quality criteria and is often less turbid than untreated water in the streams.

Increased sedimentation and turbidity are likely short-term effects due to instream construction in Miller and Des Moines Creeks. Sediment inputs may result from a variety of activities including the initial redirection of the stream, disturbance of the banks by construction, planting activities, and stormwater runoff. Exposed soil is vulnerable to erosion from short-term hydration rainfall or steady rainfall over a longer period of time which saturates the soil. Failure of erosion control measures could result in higher levels of sediment and turbidity in the aquatic system. Since chinook salmon are not found in these streams we do expect any effects to this species from sediment and turbidity changes in these streams. However, resident salmonids and other vertebrate and invertebrate species in the streams may be affected.

Increased turbidity and sedimentation is not expected to occur in Gilliam Creek because the only construction project in this basin, a new water tower, has the same footprint as the existing tower and no new impervious surfaces will be added in the basin.

Sediment may initially enter the Green River due to construction of the alternative mitigation site. The mitigation site will be dewatered during construction and pumped water will be discharged to the Green River. During excavation and until replanted vegetation has formed adequate cover, turbid water may also leave the site via the drain system, which eventually flows into the Green River.

Quantifying the impacts of turbidity to fish species is complicated by several factors (Bisson and Bilby 1985, Spence et al 1996). Turbidity will typically decrease downstream from instream

activity. However, the rate at which turbidity levels attenuate is dependent upon the quantity of materials in suspension (e.g. mass or volume), the particle size of suspended sediments, the amount and velocity of ambient water (dilution factor), and the physical/chemical properties of the sediments. The impact of turbidity on fishes is related not only to the turbidity levels (NTUs), but also the particle size of the suspended sediments. When salmonids are exposed to turbidity, they display a number of behavioral and physiological responses (i.e., gill flaring, coughing, avoidance, increase in blood sugar levels) that indicate some level of stress (Berg and Northcote 1982, Servizi and Martens 1992). The magnitude of these responses is generally higher when turbidity is increased and particle size decreased. However, moderate levels of turbidity (35-150 NTU) may benefit juvenile chinook salmon by increasing foraging rates and growth and reducing vulnerability to predators (Gregory and Northcote 1992). A particularly important impact of fine sediments is to cause embeddedness of spawning and incubation gravel with subsequent reductions in the survival of eggs and embryos.

Several factors contribute to minimize the potential impacts of sediment discharges to chinook in the Green River. Proposed water quality controls will limit the amount of sediment that will be discharged. Distance from the project site to discharge in the Green River will allow for settling of sediments prior to discharge. High turbidity levels in the Green River will cause sediment load in the discharge from the mitigation site to be imperceptible. The timing window will reduce the likelihood of chinook juveniles being present in the river during the construction period. If juvenile chinook are present in the river and turbidity levels are high, the fish are expected to move temporarily to refuges where high turbidity can be avoided, thus preventing injury or death. Because the turbidity caused by this action will be short lived, returning to baseline levels soon after construction is over, long-term impacts (i.e., adverse modification of critical habitat) will not occur. Overall, this project will not increase the existing baseline turbidity level of the Green River.

Operation of the airport after implementation of the STIA projects could impact water quality in Miller and Des Moines creeks and waters of the Puget Sound near the IWS outfall. Water quality impacts to each creek could result from the discharge of pollutants typically present in urban stormwater, as well as the anti-icing and de-icing chemicals used in airport operations. Additional water quality impacts could occur in the water column at the IWS discharge.

Effects of chemicals in stormwater generated by the STIA operations were predicted using measured chemical concentrations in existing discharges and then mathematically modeling exposure concentrations for critical habitats where chinook salmon may be present. The Port has monitored stormwater quality from its outfalls since 1995. Total petroleum hydrocarbon [TPH], fecal coliforms, BOD, TSS, turbidity, total recoverable copper (Cu), lead (Pb), and zinc (Zn), ethylene glycol and propylene glycol are the chemicals that DOE and the Port have considered to be the significant chemicals most likely to be discharged to surface waters by airport activities. Ethylene glycol and propylene glycol, potassium acetate (KA), and calcium magnesium acetate (CMA) are de-icing chemicals used at STIA.

Past data show the efficacy of BMPs implemented by the Port. For example, airport runoff is, for most parameters measured, cleaner than runoff from other urban areas although it may not meet water quality standards for protection of aquatic life. Cu and Zn concentrations have dropped significantly at outfall SDS-1 since new BMPs re-routed runoff from the SDS to the IWS in June 1997. Cu and Zn concentrations at SDN-3 and SDN-4 are high relative to water quality standards but may be reduced with new BMPs imposed with new STIA projects. Although these outfalls discharge into an area where listed chinook salmon do not occur, and where critical habitat does not exist, concentrations of Cu and Zn that exceed the water quality standards may adversely impact resident fish and other aquatic species.

Water in Des Moines Creek and Miller Creek, and discharges from the IWS may exceed chronic toxicity concentrations for Cu and acute toxicity values for Zn. The plume from the IWS outfall diffuser is located 1,800 feet off shore in Puget Sound at a depth of 156 ft to 178 ft. Discharge rates at the IWS will increase as a result of the proposed action and could raise baseline chemical concentrations above ambient in the vicinity of the outfall. Migrating adult chinook may occur within this area, however, they are unlikely to be exposed for long periods of time. Therefore, exposure in the vicinity of the IWS outfall will not significantly affect Puget Sound chinook.

Juvenile chinook salmon may also be exposed to elevated concentrations of Cu and Zn if they migrate through the estuaries at the mouths of Des Moines and Miller creek. Exposure to current concentrations of contaminants does not appear to be detrimental because toxicity testing with 100% stormwater discharge generally does not exhibit toxicity to the cladoceran (*Daphnia pulex*), a species that is very sensitive to trace metal contaminants. In addition, the healthy salmonid populations that occur in these streams would not be expected if the streams were exposed to significant contamination from Cu and Zn for extended periods. If there are no significant effects near the stormwater discharges, it is unlikely that more significant impacts would be observed in the estuary as a result of these discharges. Concentrations of Zn and Cu discharged into Miller and Des Moines creeks will decline as a result of STIA projects because pollution generating impervious surfaces (PGIS) that currently exist at the airport will be retrofit with BMP's or diverted to the IWS to reduce discharges to the streams. Conversion of current residential areas to runways and open space will also reduce heavy metal discharges from these areas.

Application of ground de-icers (potassium acetate. calcium magnesium acetate and sand on road surfaces) is not expected to affect chinook salmon because these chemicals degrade into naturally occurring elements or will be retained by treatment BMPs. Runoff of aircraft anti-icing and de-icing fluids could potentially affect chinook salmon and other aquatic species. The maximum modeled concentrations at the IWS outfall and at the mouths of Miller and Des Moines creeks are a factor of seven lower than the relevant toxicity value. Therefore, anti-icing and de-icing fluids are not expected to negatively impact chinook salmon. In addition, the highest concentrations of de-icing fluids will occur in the winter when chinook salmon are not expected to occur at these sites.

Numerous other actions are proposed by the Port to improve overall water quality in Miller and Des Moines creeks. These include source controls, diversion of contaminated materials to the IWS for treatment, extensive implementation of treatment BMPs, conversion of farmlands and golf course to shrub wetlands, and conversion of residential areas to open lands and streams with more extensive buffers.

There is a potential for contaminated leachate to enter Miller Creek from the embankment. Although the Port is accepting fill material that generally meets the Model Toxics Control Act (MTCA) Method A contaminant levels that have been established by DOE, some fill material has been accepted that contains DDT, PCBs, PAHs, and mercury. Material that is obtained from state-certified commercial borrow pits is generally accepted for airport airfield projects without source-specific environmental certification. The Washington Department of Transportation certifies materials that are geotechnically suitable but does not include testing for contaminants. Some material that does not satisfy MTCA Method A levels of contaminant may be appropriate for placement in a specific project location. The Port will consult with the DOE for approval prior to accepting fill that does not meet the Method A standard. The Port, in consultation with USFWS, has redesigned the embankment to minimize the potential release of contaminants. The Port will also develop a monitoring program to confirm that the concentration of contaminants in seepage water from the embankment are not impacting aquatic life in the streams.

Hydrology: The most important effects of urban and suburban development on salmonid populations results from alterations in stream hydrology. Removal of forests and creation of impervious surfaces prevents infiltration of water into the ground and creates rapid discharge of stormwater over the earth's surface or from stormwater pipes. Significant changes to hydrology include increased peak flows during the winter and lower summer base flows.

The proposed project will create increased impervious surfaces in the Miller Creek (approximately 106 acres), Walker Creek (approximately 6 acres), and Des Moines Creek (approximately 128 acres) watersheds. No increase in impervious surfaces is expected in the Gilliam Creek watershed. To minimize impacts to stream hydrology within these watersheds, stormwater management actions are proposed to reduce peak flow events. Detention facilities will be sized to meet King County Level 2 flow control standards. These standards require that flow duration of post-developed runoff will match the pre-developed flow duration for all flow magnitudes between 50 percent of the 2-year flow event and the 50-year flow event.

To protect Miller and Des Moines creeks from increased stormwater runoff, the Port will design STIA projects and retrofit existing airport areas to match peak flows and control the duration of erosive flow rates in the streams to pre-developed conditions. The Port will construct stormwater conveyance, detention, and treatment facilities to manage runoff from both newly developed project areas and existing airport areas. Projects designed to minimize hydrologic impacts include construction of stormwater detention ponds and wet vaults. Some BMP's employed to minimize the impacts of water quality (eg. Bioswales) and infiltration adjacent to the runways

and in reconstructed areas of Miller Creek should reduce direct runoff compared to current conditions.

The Stormwater Management Plan prepared by the Port suggests that flow controls for the STIA projects will reduce peak flows in Miller, Walker, and Des Moines creeks downstream of the STIA discharges. The target flow regime was selected to achieve the flows required by regulations and to reduce peak flows in the stream channels. Reduced peak flows will reduce bank erosion and potentially reduce sedimentation and turbidity in the creeks and their estuaries. These actions are also predicted to enhance baseline hydrologic conditions in the streams and associated estuaries.

The Comprehensive Stormwater Management Plan that was submitted by the Port is currently being reviewed by King County and the Washington State Department of Ecology. It is uncertain if the detention facilities that are currently proposed are adequate to meet Level 2 flow control standards. If the project as implemented satisfies the Level 2 flow control standard, peak flows in Miller, Walker and Des Moines creeks will be improved and alterations in hydrology will not adversely impact chinook salmon or their critical habitat in the estuaries. However, if peak flows are not reduced, and the peak/base flow indicator may be further degraded. This indicator is currently "not properly functioning" in all three watersheds. Further degradation may adversely impact critical habitat in the Miller and Des Moines creek estuaries and require reinitiation of consultation.

The proposed project may result in reduced baseflows within Miller and Des Moines Creeks, although the BA predicts that post-project hydrology will match or improve on the existing baseline for Miller, Walker, and Des Moines creeks. Current baseflows in Miller and Des Moines Creeks are approximately 1.8 cfs and 2.4 cfs, respectively. A reduction of approximately 4 percent (0.07 cfs) in Miller Creek baseflows and 7 percent (0.17 cfs) in Des Moines Creek baseflows was projected by Pacific Groundwater Group (2000). Streamflow analyses conducted by Earth Tech, Inc. (2000) also predicted reduced streamflows for both Des Moines and Miller Creeks during the low flow periods of August and September. Stream flows for Walker Creek were predicted to increase during August and September, 0.008 cfs and 0.010 cfs, respectively, as a result of recharge from the fill recharge and secondary impervious recharge. No net change in 7-day/2-year low flow is anticipated for Walker Creek. For the 7-day duration/2-year frequency stream discharge, a deficit of 0.10 cfs for Miller Creek at the SR 509 crossing and 0.08 cfs for Des Moines Creek were predicted.

Measures to prevent or mitigate effects on low summer baseflows in Miller and Des Moines Creeks include incorporation of infiltration into stormwater detention facilities, managed release of stormwater from reserved storage and secondary recharge from biofiltration strips on the embankment. According to the low stream flow analysis, average August and September flows are predicted to increase and the 7-day low flows are expected to match pre-project conditions for Miller, Walker and Des Moines creeks. If these flows are met, changes in low flow

hydrology will not adversely affect chinook salmon or their critical habitat. Several assumptions in the low flow analysis have been challenged by the ACC, including the inability to construct acceptable storage vaults, reduced infiltration from the IWS lagoons, unknown infiltration capacity and percolation properties of the embankment, potential subsurface flows in the reconstructed sections of Miller Creek, and loss of discharge and inter-basin transfer of water if IWS discharge is piped to the Renton treatment plant. These concerns suggest that low flow may actually be reduced following STIA actions. If lower flows do occur they may negatively impact resident fish and other aquatic species, but impact to chinook salmon will be discountable because chinook do not occur in these streams.

Wetland and stream habitat: The STIA projects will produce temporary and permanent effects to riparian and wetland habitats. Temporary construction impacts to stream and riparian habitat will be minimized by implementing the BMPs for erosional and sedimentation control.

Direct impacts to stream habitat caused by STIA projects include the filling of approximately 980 ft of Miller Creek. The existing stream channel influences the flow pattern in receiving waters, the amount of aquatic habitat available to macro-invertebrates, and detritus transport to the creek. This section of Miller Creek also supports resident fish including cutthroat trout and threespine stickleback but does not contain critical habitat for any listed species. This affected section of Miller Creek is an artificial (i.e., constructed ditch) stream channel adjacent to the Vacca Farm site that has been modified to support agricultural activities. Existing conditions are degraded because the natural creek was moved to its present location and constructed as a straight channel to improve drainage in the area for farming. The existing channel lacks spatial heterogeneity in streambed substrate, channel configuration, instream fish habitat and riparian vegetation. Ditching of this section of the Miller Creek channel has probably reduced macroinvertebrate habitat, detritus transport, and fish habitat compared to more natural channel reaches located downstream. Direct impacts from filling 980 ft of the stream channel would be a loss of surface water conveyance, and existing macroinvertebrate habitat and fish habitat.

The proposed project will fill 0.26 ac of Wetland 44 but no direct impacts are expected to occur to the Walker Creek channel or fish habitat. A culvert over Des Moines Creek on the Tyee Golf Course will be replaced, but this culvert does not occur in stream habitat used by listed species. No other culverts will be added to Miller, Des Moines, or Walker creeks.

Adverse impacts resulting from the filling of Miller Creek will be reduced through conservation measures designed to improve ecological functions in this reach relative to existing conditions. Conservation measures to minimize impacts include: 1) Relocating Miller Creek in a new channel that has a more natural, complex stream morphology and substrate, and 2) Establishing a native forested riparian zone to provide particulate trapping and sediment retention, optimal buffer stream temperatures, adequate shade for the stream, and a source of detritus and coarse woody debris to the downstream reaches. The net effect of relocating a reach of Miller Creek is expected to be an improvement in water quality and macro-invertebrate and fish habitat in the relocated reach and downstream portions of Miller Creek. Although there will be a temporary

loss of function while the reconstructed stream develops natural functions, these alterations will not adversely impact chinook salmon or their critical habitat because there are no chinook salmon in the stream.

The STIA projects will result in direct permanent impacts (filling) to 18.3 ac of wetlands and temporary construction impacts to 2.2 ac of wetlands. Temporary impacts during construction include removal of wetland vegetation (native and non-native), potential sedimentation, and temporary use of wetland areas for construction stormwater management. Direct impacts to wetland functions due to STIA projects include loss of wildlife habitat and other ecological functions. Wetlands in the project area support native shrub and forest vegetation that provide habitat for songbirds, amphibians, and small mammals. Several wetland areas that are in the riparian zone of Miller Creek or Walker Creek are presumed to support fish habitat in the adjacent streams. These wetlands provide shade, detrital inputs, invertebrates, woody debris, and groundwater discharge to the creeks. The riparian wetlands located on groundwater seeps adjacent to Miller and Des Moines creeks provide base flow support functions and may help maintain stream temperatures during summer months. Many of the wetlands have limited stormwater storage capacity due to their small size, lack of direct connections to the streams, or topographic conditions that limit stormwater detention. The existing groundwater recharge function is also limited because most wetlands appear to be underlain by relatively compact soils that limit groundwater infiltration rates. Wetlands within the project area that occur on relatively flat areas and receive runoff from urban areas do function to improve water quality.

Conservation measures are proposed to avoid and minimize direct impacts to the biological and physical functions of on-site wetlands. These combined conservation measures include restoration and functional enhancement of a total of 19.7 ac of in-basin wetlands, as well as enhancement of 28.4 ac of riparian and wetland buffers. In addition, to mitigate for avian habitat that cannot be replaced in-basin due to wildlife hazards to aircraft operations, a total of 40.6 ac of restored or enhanced wetlands, and 15 ac of buffer enhancement will be created at the Auburn mitigation site. It is difficult to determine if these measures will completely mitigate for lost wetland functions, however, as chinook salmon do not occur in Miller Creek, no direct impacts to the species or their critical habitat will occur from stream relocation or wetland fill. Indirect effects to chinook will be insignificant because of the minimization and conservation measures to be implemented by the applicant.

Potential indirect impacts due to filling of wetlands by the MPU project include changes in hydrology to downslope wetlands and streams, reduction in the amount of wildlife habitat available for wetland species, and changes in water quality through removal of wetland area.

Indirect impacts to hydrology include changed hydrology in wetlands downslope of filled wetlands, as well as impacts to base flow in streams adjacent to filled wetlands. Indirect impacts to the hydrology of wetlands adjacent to the fill are not expected to be significant and will not significantly alter their hydrologic function. It is anticipated, however, that Section 404 permit

conditions will require monitoring the hydrology of downslope wetlands to determine that sufficient hydrology is present to maintain the areas as wetland.

Several STIA projects are designed to avoid and minimize unavoidable impacts to wetlands. In-basin projects are proposed to restore wetland and stream functions, including the establishment of 48.06 ac of wetland enhancement and stream buffering that will be protected in perpetuity from future development. Other actions include grading to establish wetland hydrology, removing invasive non-native species, planting native wetland vegetation, and installing LWD. Mitigation actions also include removing certain existing land use conditions (e.g., paved surfaces, artificial landscaping and attendant nutrient and pesticide inputs, septic systems, and channel riprap) that degrade on-site wetland and aquatic habitat.

The buffer enhancement project will protect about 24 ac of riparian habitat along Miller Creek. Planting along the length of the buffer will vary depending upon the existing buffer condition. In sections of the buffer that are primarily lawn, areas will be planted with native trees and shrubs. Areas that contain some native and some non-native vegetation will be enhanced by either inter-planting native species to produce a continuous tree canopy or underplanting native shrubs beneath an existing canopy that lacks understory vegetation. Some areas that contain invasive species (such as Himalayan blackberry and Japanese knotweed) will be cleared, graded, and also inter-planted with native woody vegetation. The increased riparian buffer is expected to increase habitat quality for resident salmonids and other aquatic organisms in the Miller Creek basin.

To improve water quality and riparian habitat within the Des Moines Creek basin, approximately 4.5 ac of emergent wetland area, located within the existing and active Tyee Valley Golf Course, would be restored to a native shrub vegetation community. The enhancement would convert the existing turf wetland to a native shrub wetland community. Planting a native shrub community on the golf course would reduce chemical runoff reaching aquatic environments and fish populations in Des Moines Creek, increase nutrient removal and recycling in the riparian zone, and decrease wildlife attractants within 10,000 ft of the airfield.

Efforts to restore and enhance aquatic environments have generally been less successful than envisioned by their planners. Even if long term benefits result, there are often short term negative impacts as the new projects develop into natural systems. It seems likely that short term adverse impacts may occur in Miller Creek although the long term effects will probably be beneficial to most aquatic life in this ecosystem.

Chinook salmon will not be adversely affected by wetland and stream habitat projects because all wetland impacts occur in portions of the Miller and Des Moines creek basins that do not contain critical habitat for these species.

Conclusion

Effects of STIA projects were evaluated in terms of water quality, hydrology and habitat alterations for various locations within the action area. At several of these locations, chinook salmon do not occur. At other locations chinook occur seasonally or rarely. Consequently, the

effects determinations are generally insignificant or discountable (Table 2).

TABLE 2. Summary of STIA Project Effects to Puget Sound Chinook Salmon

LOCATION	Fish Present	Water Quality	Hydrology	Habitat Alterations
Miller Creek	NO	Insignificant	Insignificant	Insignificant
Walker Creek	NO	Insignificant	Insignificant	Insignificant
Des Moines Creek	NO	Insignificant	Insignificant	Insignificant
Gilliam Creek	Rarely	Discountable	Discountable	Discountable
Green River (Mitigation site)	YES	Discountable	Discountable	Beneficial
Miller Creek Estuary	Seasonally	Insignificant	Insignificant	Insignificant
Des Moines Creek Estuary	Seasonally	Insignificant	Insignificant	Insignificant
Midway Sewer Outfall	Adults	Insignificant	Discountable	Discountable

After reviewing the current status of the Puget Sound chinook salmon, the environmental baseline for the action area, and the effects of the proposed STIA actions, the NMFS concludes that these actions may affect but are not likely to adversely affect Puget Sound chinook or their designated habitat.

Incidental Take

Section 9 of the Act and federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity

NMFS does not anticipate the proposed action will incidentally take Puget Sound chinook salmon. Therefore, reasonable and prudent measures are not necessary and appropriate. Furthermore, no terms and conditions are provided as incidental take is not anticipated.

Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

The following conservation recommendations are provided for FAA, the COE and the Port:

1. Monitor fish use, including spawning activities of salmonid species, in Miller and Des Moines Creeks to determine success of habitat enhancement and restoration activities.

2. Monitor macro-invertebrates in Miller and Des Moines Creek to evaluate the effectiveness of restoration activities. Samples should be collected near the restoration sites and near the mouths of the creeks to evaluate if basin-wide impacts are detected.

3. Evaluate the effectiveness of temporary erosion and sediment control measures.

4. Monitor instream flows in Miller, Walker and Des Moines Creeks to confirm that peak flows have been reduced and low flows have been maintained.

5. Where feasible, expand the buffers along Miller Creek to restore natural ecological functions in the riparian zone and at the land-stream ecotone.

6. Implement additional best management practices to reduce concentrations of Cu and Zn below the chronic toxicity levels for aquatic organisms.

7. Monitor storm water drains for Cu and Zn to confirm that the expected reductions actually occur.

8. Use mechanical methods to remove exotic vegetation and reduce pesticide use in riparian zones, golf course and any other areas that drain to the stormwater system or directly to surface streams.

Reinitiation Notice

This concludes informal consultation on the Master Plan Update Improvements Seattle-Tacoma International Airport Project. As provided in 50 C.F.R.§ 402.16 consultation must be reinitiated where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) any take occurs; (2) new information reveals effects of the action that may affect listed species in a way not previously considered; or (3) a new species is listed or critical habitat is designated that may be affected by the action). To reinitiate consultation, the FAA must contact the Habitat Conservation Division (Washington Branch Office) of NMFS.

The WDOE and the Army Corps of Engineers have not completed their review of the project at this time, therefore issuance of the NPDES permit, water quality certification (401), and Clean Water Act Section 404 permit have not occurred. The BA includes a number of best management practices that are proposed to meet state water quality standards. The BA acknowledges that additional measures may be necessary. The NMFS' review of the effects of the proposed action assumes that the criteria in the Washington State surface water quality standards will be met by the project at all times. Any future actions that may be taken to meet State surface water quality standards or Section 404 permit requirements need to be evaluated to determine if reinitiation of this consultation is necessary. The NMFS will consult on future federal actions that are not included in this consultation.

ESSENTIAL FISH HABITAT

Federal agencies are obligated, under Section 305 of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 USC 1855(b)) and its implementing regulations (50CFR600), to consult with NMFS regarding actions that are authorized, funded, or undertaken by that agency, that may adversely affect Essential Fish Habitat (EFH). The MSA (§3) defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Furthermore, NMFS is required to provide the Federal agency with conservation recommendations that minimize the adverse effects of the project and conserve EFH. This consultation is based, in part, on information provided by the Federal agency and descriptions of EFH for Pacific coast groundfish, coastal pelagic species, and Pacific salmon contained in the Fishery Management Plans produced by the Pacific Fisheries Management Council.
The proposed action and action area are described in the BA. The action area includes habitats which have been designated as EFH for various life stages of 17 species of groundfish, and 4 coastal pelagic species (Table 2). Information submitted by FAA in the BA is sufficient for NMFS to conclude that the effects of the proposed actions are transient, local, and of low intensity and are not likely to adversely affect EFH in the long-term. NMFS also believes that the conservation measures proposed as an integral part of the actions would avert, minimize, or otherwise offset potential adverse impacts to designated EFH.

EFH Conservation Recommendations: The conservation measures that the FAA included as part of the STIA projects are along with those that NMFS recommends in the ESA Concurrence letter, adequate to minimize the adverse impacts from this project to designated EFH for the species in Table 3. It is NMFS' understanding that the FAA intends to implement the proposed activity with these built-in conservation measures that minimize potential adverse effect to the maximum extent practicable. Consequently, NMFS has no additional conservation recommendations to make at this time.

Please note that the MSA (§305(b)(4)(B)) requires the Federal agency to provide a written response to NMFS' EFH conservation recommendations within 30 days of its receipt of this letter. However, since NMFS did not provide conservation recommendations for this action, a written response to this consultation is not necessary.

This concludes EFH consultation in accordance with the MSA and 50CFR600. The FAA must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a manner that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH conservation recommendations (50 CFR 600.920(k)).

Table 3. Species of fishes with designated EFH in the action area.

Groundfish Species	Sablefish *Anoplopoma fimbria*	**Coastal Pelagic Species**
Spiny Dogfish *Squalus acanthias*	Bocaccio *S. paucispinis*	anchovy *Engraulis mordax*
California Skate *R. inornata*	Brown Rockfish *S. auriculatus*	Pacific sardine *Sardinops sagax*
Ratfish *Hydrolagus colliei*	Copper Rockfish *S. caurinus*	Pacific mackerel *Scomber japonicus*
Lingcod *Ophiodon elongatus*	Quillback Rockfish *S. maliger*	market squid *Loligo opalescens*
Cabezon *Scorpaenichthys marmoratus*	English Sole *Parophrys vetulus*	
Kelp Greenling *Hexagrammos decagrammus*	Pacific Sanddab *Citharichthys sordidus*	
Pacific Cod *Gadus macrocephalus*	Rex Sole *Glyptocephalus zachirus*	
Pacific Whiting (Hake) *Merluccius productus*	Starry Flounder *Platichthys stellatus*	

If you have any questions regarding NMFS concurrence on ESA or conservation measures for EFH, please contact Tom Sibley at the Washington State Habitat Office (206) 526-4446.

Sincerely,

Donna Darm
Acting Regional Administrator

cc: Muffy Walker, ACOE
Nancy Brennen-DubbsFWS
A. Kenny, WDOE
E. Leavitt, Port of Seattle

REFERENCES

ACOE (Army Corps of Engineers). 1997. Green/Duwamish River Basin. General investigation ecosystem restoration study reconnaissance phase. United States Army Corps of Engineers, Seattle District. Seattle, Washington

Berg, L., and T. G. Northcote. 1985. Changes in territorial, gill-flaring, and feeding behavior in juvenile coho salmon (*Oncorhynchus kisutch*) following short-term pulses of suspended sediment. Can. J. Fish. Aquat. Sci. 42: 1410-1417.

Bisson, P. A., and R. E. Bilby. 1982. Avoidance of suspended sediment by juvenile coho salmon. N. Am. J. Fish. Manage. 4: 371-374.

Des Moines Creek Basin Committee. 1997. Des Moines Creek Basin Plan. Des Moines Creek Basin Committee (City of SeaTac, City of Des Moines, Port of Seattle, and King County Surface Water Management). Seattle, Washington.

Earth Tech, Inc. 2000. Seattle-Tacoma Airport Master Plan Update, Low Streamflow Analysis. Prepared for Port of Seattle. December 2000. 29 pp plus Appendixes.

Ecology (Washington State Department of Ecology). 1992. Stormwater management manual for the Puget Sound basin, the technical manual. Washington Department of Ecology, Olympia, Washington.

Fresh, K.L., D. Rabin, C. Simenstad, E.O. Salo, K. Garrison, and L. Mathesen. 1979. Fish ecology studies in the Nisqually Reach area of Southern Puget Sound, Washington. Final rep., FRI-UW-7904, Fish. Res. Inst., University of Washington, Seattle, Washington.

Gregory, S. V., F. J. Swanson, W. A. McKee, and K. W. Cummins. 1991. An ecosystem perspective of riparian zones. Bioscience 41: 540-551.

Gregory, R. S., and T. S. Northcote. 1993. Surface, planktonic, and benthic foraging by juvenile chinook salmon (*Oncorhynchus tshawytscha*) in turbid laboratory conditions. Can. J. Fish. Aquat. Sci. 50: 223-240.

Hartt, A.C. and M.B. Dell. 1986. Early oceanic migrations and growth of juvenile Pacific salmon and steelhead trout. Int. North Pacific Comm. Bull. 46:105p

Healey, M.C. 1991. Life history of chinook salmon (*Oncorhynchus tshawytscha*). Pages 311-393 *in* C. Groot and L. Margolis, eds. Pacific salmon life histories. Vancouver, British Columbia, UBC Press.

Miller, B.S., C.A. Simenstad, L.L. Moulton, K.L. Fresh, F.C. Funk, W.A. Karp, and S.F. Borton. 1977. Puget Sound baseline program nearshore fish survey: Final Report, July 1974 - June 1977, to Washington State Department of Ecology. Baseline Study Report 10, 200 pp. Washington Department of Ecology. Lacey, Washington.

Myers, J.M., R.G. Kope, G.J. Bryant, D. Teel, L.J. Lierheimer, T.C. Wainwright, W.S. Grant, F.W. Waknitz, K. Neely, S.T. Lindley, and R.S. Waples. 1998. Status review of chinook salmon from Washington, Idaho, Oregon, and California. Seattle, National Marine Fisheries Service, NOAA Technical Memorandum NMFS-NWFSC-35, 443 p.

NMFS (National Marine Fisheries Service). 1996. Making endangered Species Act determinations of effect for individual or group actions at the watershed scale. Prepared by the National Marine Fisheries Service Environmental and Technical Services Division Habitat Conservation Branch.

NMFS (National Marine Fisheries Service). 1999a. Endangered and threatened species; threatened status for three chinook salmon evolutionarily significant units (ESUs) in Washington and Oregon, and endangered status for one chinook salmon ESU in Washington. Final Rule. March 24, 1999. Federal Register 64(56):14308-14328.

NMFS (National Marine Fisheries Service). 1999b. Guide to Biological Assessments. Washington Habitat Conservation Branch. Lacey, Washington.

NMFS (National Marine Fisheries Service). 2000. Designated critical habitat: Critical habitat for 19 evolutionarily significant units of salmon and steelhead in Washington, Oregon, Idaho, and California. Federal Register, Volume 65, Number 32, February 16, 2000. 50 CFR Part 226. pp. 7764-7787.

Pacific Groundwater Group (PGG). 2000. Sea-Tac runway fill hydrologic studies report. JE9907. Prepared for Washington State Department of Ecology, Northwest Regional Office. June 19, 2000. 79 pp. plus appendixes.

Parametrix. 1999. Draft natural resource mitigation plan for Seattle-Tacoma International Airport Master Plan Update improvements. Prepared for the Port of Seattle by Parametrix, Inc., Kirkland, Washington.

Parametrix. 2000. Comprehensive stormwater management plan for Seattle-Tacoma International Airport Master Plan Update improvements. Prepared for the Port of Seattle by Parametrix, Inc., Kirkland, Washington

Parametrix, Inc. 2000. Comprehensive Stormwater Management Plan. Master Plan Update Improvements Seattle-Tacoma International Airport. #556-2912-001. 4 volumes. December 2000.

Simenstad, C.A., K.L. Fresh, and E.O. Salo. 1982. The role of Puget Sound and Washington coastal estuaries in the life history of Pacific salmon: an unappreciated function. Pages 343-364 *in* V.S. Kennedy, ed. Estuarine comparisons. Academic Press, New York, New York.

Servizi, J. A., and D. W. Martens. 1992. Sublethal responses of coho salmon (*Oncorhynchus kisutch*) to suspended sediments. Can. J. Fish. Aquat. Sci. 49: 1389-1395.

Spence, B. C., G. A. Lomnicky, R. M. Hughes, and R. P. Novitzki. 1996. An ecosystem approach to salmonid conservation. TR-4501-96-6057. ManTech Environmental Research Services Corp., Corvallis, Oregon.

USEPA (U.S. Environmental Protection Agency). 2000a. National showcase watersheds. project description, Green/Duwamish ecosystem restoration. http://www.epa.gov/owow/showcase/duwamish/summary.html.

USFWS and NMFS (U.S. Fish and Wildlife Service and National Marine Fisheries Service). 1998. Endangered Species consultation handbook. Procedures for conducting consultation and conference activities under Section 7 of the Endangered Species Act.

Waples, R. S. 1991. Pacific salmon, *Oncorhynchus* spp., and the definition of "species" under the Endangered Species Act. Mar. Fish. Rev. 53: 11-22.

WDF (Washington Department of Fisheries), Washington Department of Wildlife, and Western Washington Treaty Indian Tribes (et al.). 1993. 1992 Washington state salmon and steelhead stock inventory (SASSI): summary report. Washington Department of Fisheries, Olympia, Washington. 212 pp.

Table 1. Proposed Master Plan Update improvement projects at Sea-Tac Airport.

Project	Description
Runway and Taxiway Projects	
Property Acquisition, Street and Utility Vacation	Includes purchasing property and demolishing existing structures between existing Sea-Tac boundary west to Des Moines Memorial Drive and State Route (SR) 509. Required for third runway embankment fill and construction impact mitigation. Acquisition and demolition is also required for the south runway protection zone (RPZ).
Embankment Fill	Embankment for third runway, constructed using imported fill. Approximately 16.5 million cubic yards (cy) will be placed over a 5- to 7-year period. Existing roads and streets under the embankment footprint will be removed.
Interconnecting Taxiways	New connecting taxiways between existing runway and third runway. Project is located on existing airfield, requiring only minimal grading.
Runway 16X/34X	Paving of third runway after completion of embankment fill.
Extension of Runway 34R by 600 feet (ft)	Extend runway by 600 ft for improved warm weather and large aircraft operations. Project is located at the southern end of the east runway.
Additional Taxiway Exits on 16L/34R	Construction of new ramps to the existing terminal apron.
Dual Taxiway 34R	Improvements to taxiways serving the South Aviation Support Area (SASA) and south apron.
Runway Safety Areas (RSAs)	
Runway 34R Safety Fill	Extend runway safety fill to meet FAA standards.
RSAs 16R/16L	Extend safety fills by 1,000 ft to meet FAA standards.
Relocation of Displaced Threshold on Runway 16L	Airfield taxiway improvements. The runway threshold (i.e., the emergency landing pad at end of runway pavement) to be relocated onto new RSA.
Miller Creek Sewer Relocation	Relocate sewer for third runway embankment and runway safety fills. New sewer to run along alignment of new 154th/156th Street.

Project	Description
Borrow Sites	
Borrow Sites	Sources of fill for third runway embankment, located on Sea-Tac property south of the airport. Approximately 6.7 million cy[1] of material to be excavated from three sites and transported across airport property to the embankment.
FAA Navigation Aids (NAVAIDS)	
New Airport Traffic Control Tower	New air traffic control tower to be located in existing developed area near terminal.
Relocate Airport Surveillance Radar, Airport Surface Detection Equipment, NAVAIDS	Existing radar and navigation equipment will be relocated to allow construction of third runway.
Airfield Building Improvements	
New Snow Equipment Storage	New building to house snow removal equipment.
Weyerhaeuser Hangar Relocation	Relocate existing hangar on west side of airfield to allow construction of third runway. New hangar will be located near south end of third runway.
Terminal/Air Cargo Area Improvements	
Relocation of Airborne Cargo	Relocate existing cargo building from air traffic control tower site to north cargo area. Located in existing developed area near terminal.
Central Terminal Expansion	Passenger terminal remodel. Located in existing developed area at terminal.
South Terminal Expansion Project (STEP)	Passenger terminal remodel. Located in existing developed area to the south of the main passenger terminal.
Northwest Hangar Relocation	Relocate Northwest hangar to site now occupied by Delta hangar. Located in existing developed area.
Satellite Transit Shuttle System Rehabilitation	Remodel and upgrade underground transit system linking terminal to satellites.
Redevelopment of North Air Cargo	New or expanded air cargo facilities along Air Cargo Road at north end of airport.

Relocation of Airborne Cargo	Relocate existing cargo building from air traffic control tower site to north cargo area. Located in existing developed area near terminal.
Expansion of North Unit Terminal (North Pier)	Addition to new passenger terminal located north of existing terminal. Located in existing developed area (Doug Fox parking lot and airport access freeway).
Project	**Description**
New Airport Rescue and Fire Fighting Facility	Replaces facility displaced by new North Terminal. The new facility will be located to the north of the North Terminal.
Cargo Warehouse at 24th Avenue South	New air cargo facility located north of SR 518 on 24th Avenue South.
Westin Hotel	New hotel located immediately north of main passenger terminal. Located in existing developed area at terminal.
New Water Tower	Construct new water tower and piping in engineering yard south of South 160th Street in subbasins (Gilliam Creek watershed) served by stormwater outfalls 012 and 013.

Roads[2]	
Temporary SR 518 and SR 509 Interchanges	Temporary access ramps to serve construction of third runway embankment and runway safety fill; to be removed after project completion.
154th/156th Street Relocation	Relocate public roadway to allow construction of third runway embankment and runway safety fills. Existing road to be demolished.
154th/156th Street Bridge Replacement	Relocate existing South 156th Street bridge over Miller Creek to accommodate the third runway footprint and South 154th/156th Street relocation. In-water work associated with this project is limited to the removal of the existing bridge and bank restoration.
Improvements to Main Terminal Roads	Transportation circulation, seismic and other improvements to roadway systems serving terminal.
Improved Access and Circulation Roadway Improvements	Improvements to existing roadway system serving passenger terminal, garage, and air cargo facilities.
North Unit Terminal Roadways	Improvements to existing roadway system to serve the new North Terminal and garage.
Improvements to South Access Connector Roadway (South Link)	Improvements to existing roadway system serving passenger terminal, garage, and air cargo facilities. Will connect terminal and garage area to South Access roadway and SR 509 extension south of airport.

Project	Description
Parking	
Main Parking Garage Expansion	Expand parking facility at main passenger terminal on north and south sides (existing developed areas), and add floors to portions of existing garage.
The North Employees Parking Lot (NEPL), Phase 1	New parking facility for employees, located north of SR 518.
North Unit Parking Structure	Construction of new garage serving new North Terminal facility. Facility will be located at existing Doug Fox parking lot.
The South Aviation Support Area	
The SASA and Access Taxiways	New airport support facility for cargo and/or maintenance, located at the south end of the airport south of the Olympic Tank Farm and South 188th Street. Airplane access will be by new parallel taxiway constructed along Runway 34R.
Relocation of Existing Facilities to the SASA	Airport operation support facilities will be relocated to the SASA once SASA site development is completed. Many of these facilities must be relocated from their present locations due to main terminal expansion (i.e., STEP and North Terminal), including Northwest hangar, ground support equipment, ground and corporate aviation facilities, new airport maintenance building, and United maintenance complex.
Stormwater Facilities[3]	
Miller Creek Detention Facility Expansion	Expand the Miller Creek Detention Facility by 16.4 acre-ft to provide flow control retrofitting for existing Sea-Tac discharges to Miller Creek. All construction would take place in uplands, and would create free-draining detention volume.
SASA Detention Pond	Create regional stormwater detention pond for the SASA project and other sites. Pond is 33.4 acre-ft and discharges to Des Moines Creek.
NEPL Vault	A 13.9 acre-ft vault to retrofit the NEPL; discharges to Miller Creek via Lake Reba.
Third Runway Vaults and Ponds	Stormwater detention vaults and ponds at the north, west, and south sides of the airport, discharging to Miller, Walker, and Des Moines Creeks.

Third Runway Vaults and Ponds	Stormwater detention vaults and ponds at the north, west, and south sides of the airport, discharging to Miller, Walker, and Des Moines Creeks.
Sea-Tac Retrofit Facilities	Detention vaults or ponds to provide flow control retrofitting for existing Sea-Tac discharges to Des Moines Creek. Vaults to be constructed in combination with third runway facilities when possible.
Cargo Vault	Detention vault for North Cargo Facility (4.5 acre-ft discharging to Miller Creek via Lake Reba).

Natural Resources	
Miller Creek Relocation	Approximately 980 ft of Miller Creek immediately downstream of the Miller Creek Detention Facility will be relocated to accommodate third runway embankment and runway safety fill.
Miller Creek Buffer and Wetland Enhancement	Establish a 100-ft buffer (average) along approximately 6,500 linear ft of Miller Creek and riparian wetlands associated with Miller Creek within the acquisition area. Enhance approximately 7.4 acres of existing wetlands along the stream.
Miller Creek Floodplain and Wetland Restoration	Excavate approximately 9,600 cy from the Vacca Farm site adjacent to Miller Creek to compensate for approximately 8,500 cy of floodplain fill for third runway embankment and north safety fill. Restore and enhance approximately 17 acres of stream habitat, floodplain wetlands, aquatic habitat in Lora Lake, and buffers at Vacca Farm.

Miller Creek Relocation	Approximately 980 ft of Miller Creek immediately downstream of the Miller Creek Detention Facility will be relocated to accommodate third runway embankment and runway safety fill.
Miller Creek Instream Habitat Enhancement	Project 1: South of the Vacca Farm site, approximately 650 ft of channel. Remove rock riprap, footbridges, and trash. Place large woody debris (LWD) throughout this section of the stream. Plant riparian areas along the stream with native wetland and upland plant species. Project 2: Approximately 150 ft upstream of South 160th Street, approximately 235 ft[1] of channel. Install LWD in the stream channel, grade a small section of the west bank of the stream to create a gravel bench in the floodplain, remove two rock weirs to improve fish passage, and plant the upland area with native trees and shrubs. Project 3: Immediately downstream of South 160th Street, approximately 380 ft[1] of channel. Grade a section of the east bank, remove a rubber-tire bulkhead and install LWD in the stream and on its banks. Plant buffer areas with native trees and shrubs. Project 4: Miller Creek immediately upstream of 8th Avenue South, approximately 820 ft[4] of channel. Grade portions of both banks. Remove footbridges and portions of concrete block walls. Install LWD in the stream and on its banks. Plant buffer areas with native trees and shrubs. In addition to these specific enhancements, debris such as tires, garbage, and fences will be removed throughout the entire stretch of Miller Creek from the Vacca Farm site south to Des Moines Memorial Drive. In areas where access is readily available, LWD will be selectively placed throughout the stream to improve instream habitat conditions.
Drainage Channels Relocation	Relocate a minimum of 1,290 linear ft of drainage channels to accommodate the third runway embankment. Plant buffers along the drainage channels with native grass and shrubs.

Miller Creek Relocation	Approximately 980 ft of Miller Creek immediately downstream of the Miller Creek Detention Facility will be relocated to accommodate third runway embankment and runway safety fill.
Restoration of Temporarily Impacted Wetlands	Approximately 2.05 acres of wetland located west of the third runway embankment, north of relocated South 154th Street, and west of the Miller Creek relocation project, will be temporarily filled or disturbed during embankment construction. When construction activities are completed, remove fill material, restore pre-disturbance topography, and plant wetlands with native shrub vegetation.
Tyee Valley Golf Course Wetlands Enhancement and Des Moines Creek Buffer Enhancement	Restore approximately 4.5 acres of emergent wetland area and approximately 1.6 acres of buffer located within Tyee Valley Golf Course to a native shrub vegetation community. The enhancement actions would be integrated into plans to construct a Regional Detention Facility on the golf course[2] (King County Capital Improvement Project Design Team 1999). The enhancement would convert the existing turf wetland to native shrub wetland community. Enhance approximately 3.4 acres (average 100 ft wide) of buffer and 1.0 acre of existing wetland along Des Moines Creek.
Wetland Habitat (including Avian Habitat) near the Green River in Auburn	Restore wetland functions to a 67-acre parcel near the Green River in the City of Auburn. Create and/or restore approximately 17.2 acres of forest, 6.0 acres of shrub, 6.2 acres of emergent, and 0.60 acre of open-water wetland. Enhance protective buffers totaling about 15.90 acres.

[1] Size modified from that originally stated in BA.

[2] Temporary roads used to haul fill material from three on-site borrow areas to construction sites are included in the analysis of the borrow areas and are not listed here.

[3] Des Moines Creek Basin Plan Committee may construct a Regional Detention Facility on Tyee Golf Course to provide regional flow control. This project would eliminate the need for Sea-Tac retrofit facilities described above. As this is a cumulative action subject to future federal action, it is not a Master Plan Update improvement.

[4] Project length includes approximately 12 ft of instream work as part of driveway demolition, and 400 ft of riparian enhancement.

G

Port of Seattle

Addendum #4 to Seattle-Tacoma International Airport Master Plan Final Environmental Impact Statement and Final Supplemental Environmental Impact Statement

Borrow Source Areas 3 and 4

and the

Federal Aviation Administration's Incorporation of NEPA Reevaluation Document

POS SEPA No. 01-16
August 10, 2001

Addendum #4 to the Seattle-Tacoma International Airport Master Plan Final Environmental Impact Statement and Final Supplemental Environmental Impact Statement for Borrow Source Areas 3 and 4 and the Incorporation of the Federal Aviation Administration's NEPA Reevaluation Document

Addendum to: Seattle-Tacoma International Airport Master Plan Final Environmental Impact Statement (FEIS) and Final Supplemental Environmental Impact Statement (FSEIS). The Seattle-Tacoma International Airport Master Plan FSEIS was issued by the Port of Seattle on May 13, 1997, following the provisions of the Washington State Environmental Policy Act (SEPA) under Chapter 43.21C. Revised Code of Washington (RCW), Chapter 197-11, Washington Administrative Code (WAC), and Resolution 3028, Port of Seattle, SEPA Policies & Procedures. The Seattle-Tacoma International Airport Master Plan FSEIS is available for review at the Port of Seattle Bid Desk, Pier 69, 2711 Alaskan Way, Seattle, Washington OR Port of Seattle Aviation Planning, 3rd Floor, Terminal Building, Sea-Tac Airport, 8:00 AM to 4:30 PM weekdays.

Name of Project: Borrow Source Areas 3 and 4 and the Incorporation of the Federal Aviation Administration's NEPA Reevaluation Document

Project Sponsor: Port of Seattle, P.O. Box 1209, Seattle, WA 98111

I. PROJECT DESIGN CHANGES TO BORROW AREAS 3 AND 4.

Background: The Port of Seattle issued the Final EIS for the proposed Master Plan improvements in February 1996, which was followed by a Supplemental EIS in 1997. The FSEIS for this proposal was issued on May 13, 1997 pursuant to WAC 197-11-340. The FEIS/FSEIS included a description of borrow source areas proposed for excavation to provide material for the proposed new third runway embankment. The FEIS/FSEIS indicated the Borrow Areas would likely be used to the maximum extent possible.

Subsequent to the issuance of the FEIS/FSEIS, the Port held discussions with regulatory agencies and conducted additional technical analysis reviews, resulting in several minor proposed modifications to the borrow source areas. The quantity of material available in the borrow areas was less than reported in the FEIS/FSEIS and the cut depth elevations were higher than will be required to remove the material. The relative elevations between the cut depths and the underlying soil layer or water table remain as stated in the FEIS/FSEIS. Thus, although the actual cuts will be deeper than reported in the FEIS/FSEIS, the modified elevations do not alter the environmental analysis or expected impacts for the project.

New project information from the additional technical analysis reviews indicates that the project refinements will result in environmental benefits and will not result in any unanalyzed probable significant adverse impacts.. As described below, the net result of the project modifications are that the use of Borrow Areas 3 and 4 are likely to cause

less environmental impact than indicated in the FEIS/FSEIS. This Addendum supplements and amends environmental evaluations presented in the original FEIS/FSEIS to reflect minor modifications to the project as described in those documents.

Summary of Revisions to The Future Conditions – Borrow Requirements and Excavation and Fill Placement sections of the FEIS/FSEIS (FSEIS, Chapter IV.19.(3)(B)(1. and 2.): Portions of the FEIS/FSEIS are updated to reflect changes as indicated in Table 1 and are described in more detail in the text.

Table 1. Borrow Area Sites 3 and 4 Revision Summary

Borrow Site 3 Information		
Original FEIS/FSEIS Master Plan Proposal	**New Addendum Proposal**	**Difference In Proposals**
Footprint of excavation area is 60 acres and fully excavated	Footprint of excavation area is 48 acres 23 acres excavated	Footprint and excavated area reduced in new proposal
Volume of excavated material is 2.9 MCY	Volume of excavated material is 1.0 MCY	Volume of excavated material reduced in new proposal
Cut depth is 0 to 55 feet	Cut depth is 15-100 feet	Cut depths deeper in new proposal
Wetlands proposed for excavation are 2.35 acres	Wetlands are protected within 50-foot buffer	Wetlands protected within 50-foot buffer in new proposal
Borrow Site 4 Information		
Original FEIS/FSEIS Master Plan Proposal	**New Addendum Proposal**	**Difference In Proposals**
Footprint of excavation area is 40 acres maximizing excavation onsite	Footprint of excavation area is 40 acres with 34 acres excavated	Excavated area reduced in new proposal
No material excavated from SR 509 corridor	Material excavated from SR 509 corridor	Material excavated from SR 509 Corridor in new proposal
Volume of excavated material is 0.3 to 2.2 MCY	Volume of excavated material is 1.3 MCY	Volume of excavated material Reduced in new proposal
Cut depth is 15-20 ft	Cut depth is 15-90 ft	Cut depth is deeper in new proposal
Topsoil management plan not included in FSEIS	Topsoil management plan Included	Topsoil management plan included in the new proposal
Property buffers are 30 ft.	Property buffers are 50 ft.	Property buffer expanded in new proposal

Borrow Area 3

Since the issuance of the FEIS/FSEIS, the proposed amount of excavation of Borrow Area 3 has been reduced. Excavation of Borrow Area 3 will not include the area south of S. 208th Street, and it will not include 2.35 acres of wetlands north of S. 208th Street that would have been eliminated under the original borrow area proposal. A 50-foot buffer will remain between the excavation and the wetland. A minimum 50-foot-wide vegetation

buffer from adjacent property lines also will be used to minimize impacts to adjoining land uses.

Approximately 23 acres of the 48-acre site will be excavated. An estimated 1.0 million cubic yards of material could be obtained from Borrow Area 3. The estimated quantity is based upon a maximum cut of elevation that is 10 feet above the water table or down to the pre-Vashon drift. The excavation depths will vary from approximately 0 to 15 feet at the south side and 100 feet at the north side.

Borrow Area 4

Approximately 34 acres of the 40-acre site will be excavated. A minimum 50-foot-wide vegetation buffer from adjacent property lines will be maintained to minimize impacts to adjacent land uses. An estimated 1.3 million cubic yards of material could be obtained from Borrow Area 4. The quantity assumes material would be excavated from within the SR 509 corridor. The estimated quantity is based upon a maximum cut of 10 feet above the water table or down to the pre-Vashon drift. The excavation depths will vary from approximately 0 to 15 feet at the east side and 90 feet at the west side.

Since publication of the FEIS/FSEIS, soil sampling identified slightly elevated levels of arsenic present in the topsoil of Borrow Area 4 related to windblown particulates from the former Asarco smelter in Tacoma. Surface deposition of windblown arsenic originating from the former Asarco smelter is a regional issue and impacts expected at Borrow Area 4 would be similar to those experienced by other undeveloped sites in the vicinity. There is no indication that the presence of arsenic in the topsoil poses an environmental health threat on a non-residential site such as Borrow Area 4. During borrow excavation, the Port proposes to develop a plan to manage the topsoil in an environmentally protective manner. This plan would include reuse of the top one foot of soil as part of the reclamation of Borrow Area 4. The topsoil would be temporarily stockpiled in or adjacent to the Borrow Areas. Following excavation of the underlying material for the embankment work, the stockpiled topsoil would be replaced.

Impacts and Mitigation: The FEIS/FSEIS described anticipated environmental consequences and proposed mitigating measures for both Borrow Areas 3 and 4. This Addendum supplements and amends environmental evaluations presented in the FEIS/FSEIS and new information regarding revisions to Borrow Areas 3 and 4 is presented.

The FEIS/FSEIS and the current proposal are consistent in that the lower limit of the excavation will be a maximum cut of 10 feet above the water table or to the pre-Vashon drift across each of the Borrow Areas. The cut depth indicated in the FEIS/FSEIS for Borrow Areas 3 and 4 was modified.

While the current proposal differs from that described in the FEIS/FSEIS by proposing excavation to a deeper elevation and by proposing extraction of materials from the Washington State Department of Transportation's SR 509 right-of-way, these variances are not expected to create any significant environmental impacts over and above those addressed in the FEIS/FSEIS documents.

The change in cut depths, and reliance on access to the WSDOT-ROW to maximize the amount of extractable material from the borrow areas are both consistent with general assumptions reported in the FEIS/FSEIS.

The new estimated quantity of material available for excavation is less, the area of surface disturbance is less, the lower limit of excavation remains the same, and several wetlands will be preserved by the new proposal. The variations are not expected to result in any additional or new environmental impacts to wetlands or groundwater. In most cases, the impacts from the new proposal would diminish from levels estimated by the FSEIS, especially for surface impacts and wetlands.

The topsoil management plan will mitigate impacts to the environment resulting from excavation of the topsoil containing low levels of arsenic. The plan will adhere to applicable local, state and federal guidelines and environmental regulations.

II. INCORPORATION BY REFERENCE OF THE FEDERAL AVIATION ADMINISTRATION'S NEPA REEVALUATION DOCUMENT (*APPENDIX A REEVALUATION OF AIRPORT ACTIVITY AND CHANGES TO THE MASTER PLAN UPDATE AT SEATTLE-TACOMA INTERNATIONAL AIRPORT*) FOR PURPOSES OF THE STATE ENVIRONMENTAL POLICY ACT ("SEPA") RCW CH. 43.21C.

Background: The Port has reviewed the document entitled *Appendix A Reevaluation of Airport Activity and Changes to the Master Plan Update at Seattle-Tacoma International Airport,* the NEPA Reevaluation Document that has been published by the Federal Aviation Administration ("FAA") pursuant to the National Environmental Policy Act (("NEPA") 42 U.S.C. 4321 *et seq.*). This is a document that appends the Record of Decision: Environmental Reevaluation For Master Plan Update Development Actions, Sea-Tac International Airport.

The Port hereby incorporates by reference for purposes of SEPA all of the analysis, findings, and conclusions set forth in the Reevaluation Document.

This incorporation by reference is done pursuant to RCW 43.21C.110, WAC 197-11-600(4)(b) and (c), and WAC 197-11-635:

The complete title of the Reevaluation Document is: *Appendix A Reevaluation of Airport Activity and Changes to the Master Plan Update at Seattle-Tacoma International Airport.*

The content of the Reevaluation Document is summarized as follows:

The FAA reevaluated the continued validity of the FEIS/FSEIS in light of the following events and circumstances that occurred since the FSEIS was issued in May 1997:

- Variance between actual activity levels at the airport and the levels forecast in the FSEIS. In addition, the implications of the FAA's Terminal Area Forecast were considered.

- New information available since publication of the FSEIS including additional wetlands, national listing of certain species pursuant to the Endangered Species Act, and preparation of a Part 150 Noise Compatibility Planning Study.
- Modifications to the Master Plan Update projects.
- Cumulative impacts of project modifications and changes in the surrounding environs.

Impacts and Mitigation: Based on this reevaluation, the FAA concluded that the events and circumstances are not significant, are not substantially greater than what had been reported previously, and do not warrant the preparation of a Supplemental EIS.

Copies of the Reevaluation Document are available to members of the public for inspection at the following location:

Federal Aviation Administration
Airports Regional Office, Room 540
1601 Lind Ave, SW
Renton, Washington 98055-4056

Summary: The current set of FEIS/FSEIS documents have analyzed the known range of potentially significant environmental impacts potentially associated with the new information and project changes to the Master Plan Update project components that have occurred since issuance of the FEIS/FSEIS.

The FAA's NEPA Reevaluation Document has adequately analyzed the new information and project changes described in that document.

SEPA Review: The Port of Seattle has reviewed the new information and proposed project changes for Borrow Areas 3 and 4, and it has determined that the new information and minor changes are within the scope of the original project; that no additional significant, adverse environmental impacts are likely to result from the new information and project changes; that further supplemental environmental analysis is not required under SEPA.

The Port has also reviewed the FAA's NEPA Reevaluation Document and it concurs with the FAA's conclusion that no significant, adverse environmental impacts have been identified from the new information presented or are likely to occur from the project changes that are described in that document. Therefore, further supplemental environmental analysis is not required under SEPA.

Date Addendum Issued: August 13, 2001

SEPA Lead Agency: Port of Seattle

Contact Person: David McCraney, Environmental Program Manager, Port of Seattle, Health, Safety & Environmental Services, P.O. Box 1209, Seattle, WA. 98111. Telephone: 206/728-3193.

SEPA Responsible Official: Michael Feldman, Director, Aviation Facilities, Port of Seattle, P.O. Box 68727, Seattle, WA 98168, (206) 439-7706.

Signature

August 10, 2001
Date