



TECHNICAL MEMORANDUM No.8 FINAL

ENVIRONMENTAL OVERVIEW

Seattle-Tacoma International Airport

Prepared for

Port of Seattle
Seattle, Washington

May 2018



In association with

Synergy Consultants, Inc.



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Chapter 1: Introduction

1.1 Document Purpose

The purpose of the *Sustainable Airport Master (SAMP) Plan Environmental Overview* is to identify the potential environmental effects of the proposed Sustainable Airport Master Plan (SAMP) Near-Term Projects. These Near-Term Projects are identified in detail in *SAMP Technical Memorandum No. 7 Facilities Implementation and Financial Feasibility*.

The Environmental Overview is not a replacement for the analysis associated with environmental review and compliance (i.e. NEPA and SEPA). Rather, the scope for this Environmental Overview relies on existing published environmental conditions and qualitative estimates of the effects of the SAMP Near-Term Projects. Master plans, per Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5070-6B – *Airport Master Plans*, contain an environmental overview to document environmental conditions that should be considered in the identification and analysis of airport development alternatives.

This Environmental Overview is organized into three chapters:

- Chapter 1 summarizes the Near-Term Projects and describes the methodology employed to identify potential environmental effects.
- Chapter 2 identifies the environmental features and resources that are present in the Airport area.
- Chapter 3 identifies the potential effect of the Near-Term Master Plan development recommendations on these features.

The effects are referred to as potential throughout this document, as future environmental review (i.e. NEPA and SEPA analysis and herein referred to as the SAMP Environmental Review process) will analyze the more specific and detailed required assessment.

1.2 Summary of the Near-Term Projects

Figure 1-1 shows the SAMP Near-Term Projects. The following sections describe the Near-Term Projects and elements of data needed to consider environmental effects.

1.2.1 Activity Forecasts

Technical Memorandum No. 4 *Forecasts of Aviation Activity* documents the projections of future aviation activity at Sea-Tac Airport upon which the Near-Term Projects were formulated. Table 1-1 summarizes the activity forecast in 2019, 2024, and activity in the 2027 timeframe associated with the Near-Term Projects. The 2019 and 2024 forecasts are associated with five-year increments and are referred to as Planning Activity Levels (PAL); thus PAL 1 and PAL 2.

Table 1-1
Summary of Aviation Activity Forecasts
Seattle-Tacoma International Airport

	2016	PAL 1 2019	PAL 2 2024	Near-Term 2027
Total passengers	45,737,115	44,815,200	51,827,400	56,083,600
Total air cargo (in metric tons)	319,490	351,544	382,920	401,580
Aircraft operations	340,478	398,910	448,860	477,660

Source: LeighFisher, September 2015.

1.2.2 The Near-Term Projects

The Environmental Overview will focus on the Near-Term Projects (i.e. what is reasonably foreseeable). Additional planning and environmental review will be required for the Long Term Vision (i.e. what is considered speculative, see Section 1.2.3).

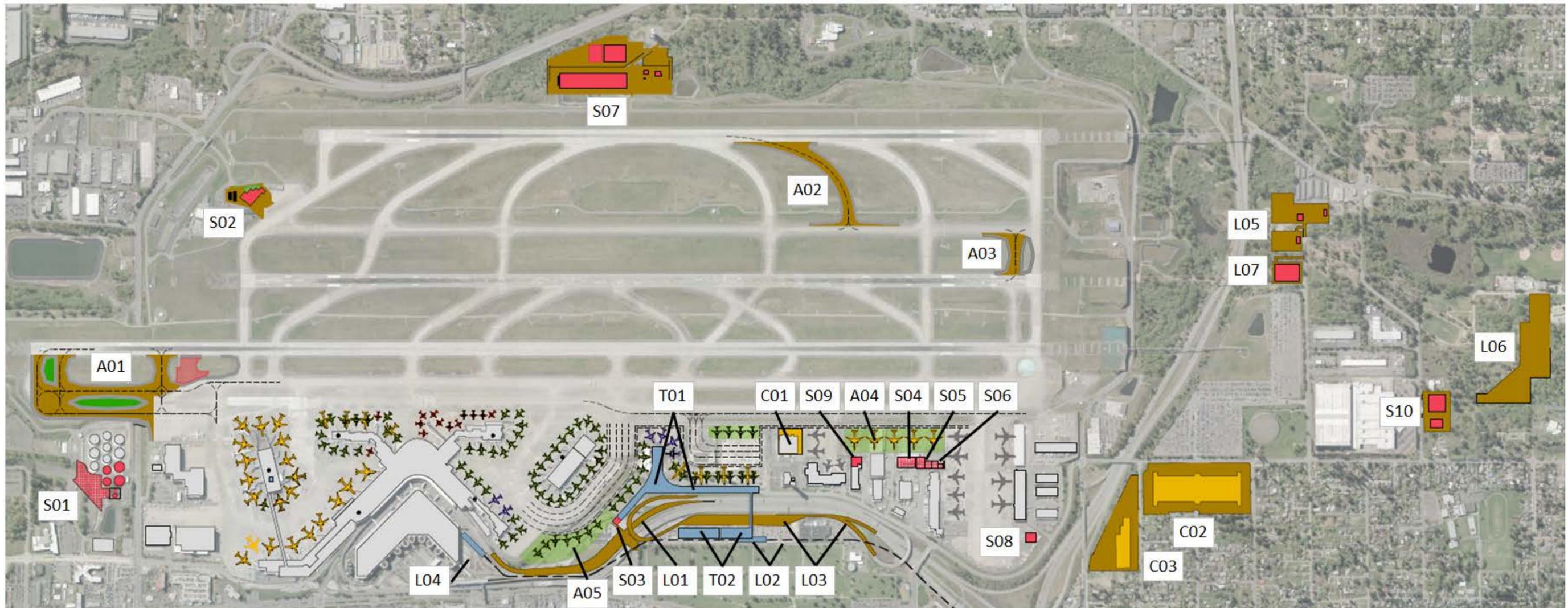
The Near-Term Projects, shown in Figure 1-1, are intended to address the Airport's facility needs through 2027 at an estimated 56 million annual passengers and 477,660 annual aircraft operations. The year 2027 corresponds to when gates, hardstand, and terminal space is estimated to become operational with specific improvements included in the Near-Term Projects.

As noted above, the Near-Term Projects are identified in detail in SAMP *Technical Memorandum No. 7 Facilities Implementation and Financial Feasibility*.

1.2.3 The Long-Range Vision

Technical Memorandum No. 7 Facilities Implementation and Financial Feasibility notes that the Near-Term Projects are identified in the context of a Long-Range Vision for Sea-Tac Airport. At this time, the longer-range projects are not ripe for conducting detailed environmental impact analysis. The Long-Range Vision will require future evaluation and definition. Once those projects are ripe for review, the Port will be required to comply with NEPA and SEPA. For purposes of transparency, the Long-Range Vision is noted here and will be disclosed in SAMP Environmental Review documentation.

Figure 1-1
Near-Term Projects
Seattle-Tacoma International Airport



Airside	Terminal	Landside	Airport/Airline Support
A01 Taxiway A/B Extension	T01 North Gates	L01 NAE Relocation (<i>southbound lanes</i>)	S01 Fuel Farm Expansion
A02 Runway 34L Highspeed Exit	T02 North Terminal & Parking	L02 Elevated Busway & Stations	S02 Primary ARFF
A03 Taxiway D Extension	Cargo	L03 North Terminal Roads/Curbside	S03 Secondary ARFF
A04 North Harstand	C01 Cargo 4 South Redevelopment	L04 Main Terminal North GT Lot	S04 Fuel Rack Relocation
A05 Concourse D Hardstand	C02 Off-Site Cargo Ph 1 (<i>L-Shape</i>)	L05 North GT Holding Lot	S05 Triculator
	C03 Off-Site Cargo Ph 2 (<i>L-Shape</i>)	L06 Employee Parking Surface Lot	S06 Consolidated De-icing Facility
		L07 Employee Parking Structure	S07 Port Maint. (<i>Westside Maint. Campus</i>)
			S08 Airline Support (<i>north</i>)
			S09 Airline Support (<i>west</i>)
			S10 Centralized Rec. & Dist. Center

Source: Port of Seattle and LeighFisher, 2017.

Projects shown in Figure 1-1 include:

- A01 – Taxiway A/B Extension –This project would relocate Taxiway B south of Taxiway S and provide a new parallel taxiway, Taxiway A.
- A02 – Runway 16R-34L Blast Pads –The existing blast pads on RWY 16R-34L would be expanded to standard 220'x400' size.
- A03 – Taxiway L Relocation (*a current planned project expected to be completed in 2018*) –Taxiway L would shift approximately 400' to the south.
- A04 – Taxiway B 500' Separation & RIM Mitigation –Taxiway B would be moved 100' to the east.
- A05 – Runway 34L High-speed Exit – High-speed exits allow landing aircraft to exit the runway at relatively higher speeds, leading to less time on the runway.
- A06 – Taxiway D Extension –This project would extend Taxiway D from Runway 16C-34C west to Taxiway T.
- A07 – Hardstand (*north*) –The hardstand would accommodate 5 aircraft.
- A08 – Hardstand (*central*) –The hardstand would serve 7 aircraft.
- A09 – Taxiway Fillets [*NOT SHOWN*] –Fillets which currently do not meet standards would be improved when the fillet/area needs a reconstruction or impacted by a project.
- A10 – Taxiway Q Hot Spot/Runway Incursion Mitigation (HS/RIM) (*a current planned project expected to be completed in 2018*) [*NOT SHOWN*] – Adjustments would be made to the Taxiway Q centerline paint markings and in-pavement taxiway centerline lights.
- T01 – North Gates – The North Gates project would be a multi-level concourse connected to the Second Terminal via a pedestrian bridge and would serve 19 gates.
- T02 – Second Terminal & Parking –The Second Terminal would include facilities for passenger check-in; passenger and baggage screening; airline offices, baggage conveyance and claim; concessions; and restrooms.
- C01 – Cargo 4 South Redevelopment –The Cargo 4 South site would be redeveloped to maximize warehouse capacity.
- C02 – Off-site Cargo Phase 1 (*L-Shape*) – would include a 330,000-sf building with warehouse and office space, truck terminals, and parking for visitors and employees.
- C03 – Off-site Cargo Phase 2 (*L-Shape*) – would include a 90,000-sf building with warehouse and office space, truck terminals and parking for visitors and employees.
- L01 – North Airport Expressway (NAE) Relocation (*southbound lanes*) –The reconstructed southbound lanes would include the same number of lanes as exist today and would result in the elimination of the cell phone waiting lot as well as Air Cargo Road and associated on/off ramps south of Gate E125 and air traffic control tower.
- L02 – Elevated Busway & Stations –This project would provide a connection for passengers accessing the Main Terminal, Second Terminal, and Rental Car Facility (RCF). The Main Terminal busway station would be at level 4 at the north end of the existing Main Parking garage and over the Main Terminal North Ground Transportation (GT) lot.

- L03 – Second Terminal Roads & Curbside – Landside improvements are required to provide ingress/egress to the Second Terminal and to connect the existing roadway system, providing access to/from the existing Main Terminal.
- L04 – Main Terminal North Ground Transportation (GT) Lot – Expansion of the existing lot to accommodate increased demand of charter and cruise passenger buses.
- L05 – North Ground Transportation (GT) Lot – A new GT lot is needed replace the S 160th St. GT lot displaced by the Elevated Busway.
- L06 – Employee Parking Surface Lot –A new 1,500 stall employee parking surface lot would be constructed on Port owned property north of SR 518.
- L07 – Employee Parking Structure –A new parking structure of up to 2,000 stalls would be constructed on Port property adjacent to and west of the North Employee Parking Lot.
- S01 – Fuel Farm Expansion – Expansion of the fuel farm would include additional settling tank capacity and infrastructure to support the Port’s sustainable aviation fuel (SAF) initiative.
- S02 – Primary Aircraft Rescue and Firefighting (ARFF) station – Relocation of the Primary ARFF station from its current location in the Cargo 6 area is required to clear the site for construction of T01 North Gates.
- S03 – Secondary ARFF –With the relocation of the Primary ARFF station, a Secondary ARFF is needed to provide ambulatory response to the Terminals and Concourses; fuel spill and fire response to the concourse ramp areas, and back-up emergency response to the airfield.
- S04 – Fuel Rack Relocation – Relocation of the fuel rack from its current location in the Cargo 6 area is required to clear the site for construction of T01 North Gates.
- S05 – Triculator –To facilitate the A08 Hardstand (*central*) project, the triculator (a waste grinder) would be relocated to the North Cargo area east of the new A07 Hardstand (*north*).
- S06 – Consolidated De-icing Fluid Storage Tanks – In an effort to consolidate storage of aircraft deicing fluid and to clear a site for the construction of T01 North Gates, deicing fluid tanks are proposed on both the north and south ends of the airfield.
- S07 – West-side Maintenance Campus – Relocation of the Port’s Aviation Maintenance Facility from its current location in the North Cargo area to clear the site for construction of the A07 Hardstand (*north*) project.
- S08 – Airline Support (*north*) & S09 – Airline Support (*west*) – To accommodate displaced Ground Service Equipment (GSE) maintenance and aircraft maintenance functions from the United Airlines maintenance building and Swissport cargo facility, and aircraft maintenance functions from the United Airlines maintenance building, two airline support buildings/expansions are planned.
- S10 – Centralized Receiving & Distribution Center (CRDC) – A new CRDC is needed to improve security and more efficiently screen and move supplies to concessionaires in the current and future passenger terminals.

1.3 Environmental Overview Methodology

In preparing this Environmental Overview, relevant past studies for the Airport were reviewed. Information from this review served as the basis for determining the presence (or lack of) and condition of environmental features and resources. The following, information sources were considered within each resource area:

- 2014 Seattle-Tacoma International Airport Part 150 Study Update
- 2009 Seattle-Tacoma International Airport, *A Vision for 2014 and Beyond: Environmental Strategy Plan*
- 2007 Final Environmental Assessment for the Comprehensive Development Plan (CDP) at Seattle-Tacoma International Airport
- 2001 NEPA Re-Evaluation of the Master Plan Update and Record of Decision (ROD)
- 2000 Natural Resource Mitigation Plan, Master Plan Update Improvements for Seattle-Tacoma International Airport as modified and finalized in 2004
- 1997 Final Supplemental Environmental Impact Statement (EIS) for the Seattle-Tacoma International Airport Master Plan Update
- 1995 Final Environmental Impact Statement for the Seattle-Tacoma International Airport Master Plan Update
- 1994 Final Environmental Impact Statement Port of Seattle South Aviation Support Area

The sources of information above, in addition to project-specific documentation, were used to identify the existing conditions. Then, based on the Near-Term Projects, the potential effects were estimated by either professional judgment or comparing the Near-Term Projects location/profile with the location of known environmental resources. These effects were estimated based on the consideration of the location and extent of proposed facilities relative to the identified environmental resources.

Chapter 2: Existing Setting

This section presents the existing conditions associated with the primary factors derived from FAA Orders 1050.1F, *Environmental Impacts: Policies and Procedures*, and 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, considered during the environmental review process. The discussion in this section focused on airport-owned land except where impacts would extend off-Airport, as the Near-Term Projects would not involve acquisition; all development would occur on existing land owned by the Port.

The existing conditions identified in this chapter will be verified and updated to 2017 conditions during the SAMP Environmental Review process.

2.1 Air Quality

Air quality is regulated through the Clean Air Act and is addressed at the federal level by the U.S. Environmental Protection Agency (USEPA), at the State level by the Washington Department of Ecology (Ecology), and at the local level by the Puget Sound Clean Air Agency. The federal government, and the state of Washington, have established health-based Ambient Air Quality Standards (AAQS) for six common air pollutants (also known as “criteria pollutants”): ozone, carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO_x), particulate matter (coarse particles PM₁₀ and fine particles PM_{2.5}), and lead. Regions receive “attainment,” “nonattainment,” and “maintenance” designations by the USEPA based on the status relative to the National AAQS (NAAQS). Attainment refers to geographic areas that meet the NAAQS, while nonattainment refers to areas that do not meet the NAAQS. Maintenance areas refer to geographic areas that were once nonattainment but have recently achieved compliance with NAAQS and are subject to a State Implementation Plan (SIP).

Sea-Tac Airport is located within a portion of the Central Puget Sound which is in attainment for all criteria pollutants, but because of past exceedances of the carbon monoxide standard, is designated as maintenance. The area was previously designated attainment/ maintenance for ozone under the 1-hour ozone standard; however, the 1-hour standard was revoked by USEPA effective June 15, 2005 and the area attains the current 8-hour ozone standard. Several sub-areas within the Central Puget Sound region are classified as maintenance for the PM₁₀ standards, including Kent, Duwamish, and Tacoma tide flats; however, the Airport does not fall within any of the PM₁₀ maintenance areas.

Table 2-1 summarizes the criteria pollutant inventory for airport operations. Construction emissions are not included in the table as existing construction emissions were not part of the study scope; they will be included in the SAMP Environmental Review process.

The emissions inventory for 2016 was prepared with the FAA’s Aviation Emissions Design Tool (AEDT) Version 2c, Service Pack 2. It is important to note that surface transportation related emissions were not quantified for the 2016 evaluation, as insufficient data were available. Surface transportation will be evaluated in detail in the SAMP Environmental Review documentation.

Table 2-1
Sea-Tac Airport Related Critical Pollutant Emissions (2016)
 Seattle-Tacoma International Airport

Emission Source	Tons of Pollutant per year					
	Ozone Precursors			Particulate Matter		
	NO _x	VOC	CO	SO _x	PM ₁₀ (coarse)	PM _{2.5} (fine)
Aircraft Engines	1,775	261	1,455	162	13	13
APUs	40	3	33	5	5	5
GSE	<u>370</u>	<u>94</u>	<u>2,769</u>	<u>19</u>	<u>25</u>	<u>25</u>
Subtotal	2,185	358	4,257	186	43	43
Stationary Sources	18	1	12	0	1	1
Parking	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Ground Transportation	<u>n.a.</u>	<u>n.a.</u>	<u>n.a.</u>	<u>n.a.</u>	<u>n.a.</u>	<u>n.a.</u>
Total	2,267	379	4,841	190	48	47

Source: Landrum & Brown, using the FAA’s AEDT Version 2c Service Pack 2, Sept 2017.
 May not add due to rounding.

The Airport’s operations emissions inventory includes emissions from aircraft operations in the landing and takeoff cycle (LTO), aircraft auxiliary power units (APUs), ground support equipment (GSE), and stationary sources.

2.2 Biological Resources

2.2.1 Plants

The predominant vegetation communities on Airport land and in the vicinity are managed areas of grasses and herbaceous vegetation, with isolated native forest, shrub, and wetlands.* Over time, residential and commercial areas, highway corridors, and airport development have replaced most native plant communities with buildings, pavement, and ornamental landscaping. Approximately 613 acres of managed grassland, 125 acres of upland shrub, 165 acres of upland forest, 415 acres of mixed vegetation (ornamental plants, native trees, and shrubs), and 132 acres of wetlands were identified in the 2008 Comprehensive Development Plan EA as occurring on Port-owned land at Sea-Tac Airport. In addition, as part of the conditions enabling the construction of Runway 16R/34L, on-site, in-basin, mitigation was provided that affected wetlands, hydrology, water quality and aquatic habitat in the

*Comprehensive Development Plan, Section 4.34. It was noted that at that time, the area within the limits of the Third Runway (commissioned in 2008) had been cleared and graded but not yet vegetated.

Miller and Des Moines Creek basins. Approximately 88 acres of contiguous wetland, stream, and buffer mitigation exists on airport property that is permanently protected by restrictive covenants.

2.2.2 Fish

Streams within the Airport vicinity include Des Moines, Miller, Walker, and Gilliam Creeks and their tributaries. Past and current land use practices degraded fish habitat in these streams, resulting in the decline of fish stocks. In Des Moines, Miller, and Gilliam Creeks, erosion and scour in upper reaches have resulted in high levels of downstream sedimentation during high flows. Resident and anadromous fish species have been present in Des Moines, Miller, and Gilliam Creeks. Anadromous fish populations reported within these streams are coho salmon (*Oncorhynchus kisutch*) and chum salmon (*Oncorhynchus keta*). Sea run cuts have been documented in Des Moines and Miller Creeks.

In light of new endangered species and potential candidate species, the Port commissioned a review of endangered species and habitat on Port owned land in 2014.* The 2014 Port Study addressed the presence of fish. Habitat for the Puget Sound/Georgia Basin yelloweye rockfish does not exist on Airport lands. Because juvenile yelloweye rockfish do not typically occupy shallow waters, they are not expected to be present in the in the waters on Airport land. Marine species do not occur in the water resources on Airport lands; Airport lands do not include deep water marine environments required by humpback whales, nor does it directly support prey species for humpback whales.

2.2.3 Wildlife

The Port study also addressed the presence of wildlife. Canada lynx, gray wolves, grizzly bears, northern spotted owl, and North American wolverine have habitat requirements for forested old growth habitat or habitat within upper elevations of the Cascade Range. These species were therefore discounted from further consideration because there is no suitable habitat for these species in the Airport area, and no occurrences of these species have been documented in the project vicinity.

The 2014 study noted that no critical habitat for northern spotted owl, marbled murrelet, or Canada lynx had been designated in the Airport area by the U.S. Fish and Wildlife Service (USFWS) and critical habitat has not been designated for gray wolves, grizzly bears, and North American wolverine. The Comprehensive Development Plan EA noted that the Airport is located in the Puget Sound Conservation Zone for marbled murrelet in the marbled murrelet Recovery Plan. However, critical habitat for the murrelet had not been identified. The Port's 2014 study noted that USFWS would no longer be evaluating project impacts related to murrelet flying over construction areas.

The fisher is a medium-sized mammal (part of the weasel family) native to North America and a candidate species for USFWS. The 2014 Port Study noted that this species is present in the Olympic peninsula through a reintroduction program; the natural-born populations are believed to be extirpated in Washington. While the historical range may have overlapped with Port-owned properties, these are no longer suitable habitat for fisher because historically and currently, fishers avoid non-forested habitats such as open forest, grassland, and wetland habitats. The Port has not identified the fisher as occurring on Airport property.

*Port of Seattle, *Endangered Species Review*, Sea-Tac International Airport, prepared by Anchor QEA, October 2014.

In 2014, the USFWS listed the yellow-billed cuckoo as a threatened species. Yellow-billed cuckoos are officially considered extirpated in Washington, and the occasional sightings are migrants. This species prefers large stands of cottonwoods in riparian zones along the Columbia River, but the species was potentially historically present in Puget Sound lowlands. Airport property may have been characterized as Puget Sound lowlands in the past, but almost no habitat of this type remains near the Airport according to the Port's 2014 Study, due to past regional and airport development.

In 2014 the USFWS listed the Oregon spotted frog as threatened. Historically, it may have been present in the prairie lakes and streams that were found in Puget lowlands but it is not known to currently be present in King County. This habitat no longer occurs on Airport lands or in the immediate vicinity due to regional development.

A Port 2017 Study noted that the streaked horned lark was listed as threatened by USFWS in October 2013. Subsequently, the Port collaborated with the USFWS and the FAA to conduct monitoring and documented no evidence of lark presence.* The Port, with guidance from the FAA, will continue to monitor for the presence of the streaked horned lark through its wildlife hazardous management plan.

The Taylor's checkerspot butterfly was listed as endangered by USFWS in October 2013, and critical habitat was designated. Critical habitat does not exist in King County for this species.

In 2014, USFWS published the final rule for threatened status and designated critical habitat for four sub-species of Mazama pocket gophers found in specific locations of Thurston and Pierce counties. These four species of pocket gophers are: Olympia pocket gopher (*Thomomys mazama pugetensis*), Roy Prairie pocket gopher (*T. m. glacialis*), Tenino pocket gopher (*T. m. tumuli*), and Yelm pocket gopher (*T. m. yelmensis*). Available information does not suggest that any of the listed sub-species of Mazama pocket gopher exist elsewhere in Washington outside of the population areas identified as supporting critical habitat. Therefore, and per the USFWS, none of the listed pocket gopher species are likely to occur within Airport lands.

2.3 Climate

During the SAMP Environmental Review process, a climate analysis will be prepared to comply with FAA and Washington State Department of Ecology guidance (i.e. FAA Order 1050.1F and accompanying desk reference and Guidance for Ecology—Including Greenhouse Gas Emissions in SEPA Reviews). For purposes of this Environmental Overview, data available from the Port's Airport Carbon Accreditation (ACA) process greenhouse gas inventories were used.

*Center for Natural Lands Management, Final Report for Streaked Horned Lark Occupancy Surveys, Sea-Tac Airport, October 19, 2017.

An essential element in preparing a greenhouse gas inventory is the identification of the inventory boundaries. The boundaries establish what sources of emissions that an airport has ownership and control over, and which sources should be included in the inventory. U.S. Environmental Protection Agency (USEPA) and World Resource Institute (WRI) guidance suggest that the following be considered when establishing the boundaries:

- **Organizational structure:** as reflected by control through ownership, legal agreements, joint ventures, etc. In the case of the Port, which has marine and aviation facilities, this inventory boundary was limited to Sea-Tac Airport.
- **Operational boundaries:** Once an entity has determined its organizational boundaries, it then sets its operational boundaries. This involves identifying the emissions associated with its operations and categorizing them as direct, indirect, and optional emissions (Scope 1, 2 and 3 respectively).
 - **Scope 1 (Direct emissions)** are from sources that are owned or controlled by the party. For example, emissions from combustion in owned or controlled boilers, furnaces, vehicles, etc. The WRI methods refer to direct emissions as Scope 1 emissions.
 - **Scope 2 (Indirect)** reflect purchased electricity.
 - **Scope 3 (Optional emissions)** are a consequence of the activities of the entity but occur at sources owned or controlled by another party. Scope 3 is an optional reporting category that allows for the identification of all other emissions that are a consequence of the activities of the entity but occur from sources not owned or controlled by the entity.

All discussions of greenhouse gas emissions identify those that are owned and controlled by the Port as Scope 1 and 2, whereas those that are owned and controlled by other parties are referred to as Scope 3; at Sea-Tac Airport, Scope 3 emissions are owned and controlled by airport tenants and the public accessing the Airport on surface vehicles.

The Port of Seattle was the first airport in North America to participate in the ACA Program at Level 2 (*Mapping*). In 2017, the Port upgraded its certification to Level 3 (*Optimisation*) requiring the Port to have an emissions inventory following the ACA protocol; a carbon reduction policy and stakeholder outreach plan; emissions inventory for Scope 1, 2 and 3; and a third party to independently verify the Port's inventory and program.

Table 2-2 shows the Port's 2016 ACA Greenhouse Gas Inventory.

2.4 Coastal Resources

All coastal counties within the state of Washington are subject to the Coastal Zone Management Program. Enforceable policies of the State's Coastal Zone Management Program include the SEPA, the Clean Water Act, the Clean Air Act, the State Shoreline Management Act, and local shoreline master programs. Local shoreline master programs are approved and adopted by the state, which ensures consistency with the Coastal Zone Management Act.

The Washington State Department of Ecology determines the consistency of a proposed development with the Coastal Zone Management Act and the Washington Coastal Zone Management Program. Before issuing a Clean Water Act Section 10/404 permit, the U.S. Army Corps of Engineers must receive notice that Department of Ecology, following review of a proposed project, concurs with the project sponsor's certification statement of compliance with the Washington Coastal Zone Management Program.

Table 2-2
Port of Seattle Scope 1, 2, and 3 Greenhouse Gas Emissions
 Seattle-Tacoma International Airport

Scope/Source			2016 Tons of CO ₂	Percent of Total	
Scope 1	Stationary Source	Natural Gas Boilers	14,484	2.1%	
		Diesel in Back-up Generators	104	<0.1%	
	Mobile Source	Gasoline Use in Fleet	1,051	0.1%	
		Diesel Use in Fleet	277	<0.1%	
		CNG Use in Fleet	2,506	0.4%	
Scope 2	Indirect Energy	PSE Electricity Purchased	1,769	0.3%	
		SCL Electricity Purchased	1,103	0.2%	
		BPA Electricity Purchased	24	<0.1%	
Scope 3	Port	Business Travel Flights	285	<0.1%	
		Employee Commute	4,299	0.6%	
	Aircraft	Engines LTO	396,306	56.3%	
		APUs	32,965	4.7%	
	GSE	Airfield vehicles & equip	8,027	1.1%	
	Tenant	Electricity	553	0.1%	
		Natural Gas	629	0.1%	
	Airport Waste Ground Transportation	Employee Commute	Employee Commute	13,424	1.9%
			Port & Tenant Waste	1,344	0.2%
		Curbside Pickup & Drop-off	Parked Vehicles	52,233	7.4%
			Rental Cars	17,718	2.5%
			Taxis	9,067	1.3%
			TNCs	10,387	1.5%
			Limos	8,245	1.2%
			Parking and Hotel Shuttles	7,524	1.1%
			Vans and Buses	5,772	0.8%
Public Transit			1,344	0.2%	
TOTAL Scope 1, 2, 3			703,760	100%	

Source: Port of Seattle, ACA submittal for year 2016. May not add due to rounding.

2.5 Department of Transportation Act Section 4(f)

The U.S. Department of Transportation Act of 1966, specifically Section 4(f), provides for the protection of certain publicly owned resources. DOT Section 4(f) resources include public parks; recreational areas; wildlife and waterfowl refuges of federal, state, or local significance; or any land from an historic site of federal, state, or local significance. An impact or use of DOT Section 4(f) lands occurs when:

1. Land from a 4(f) site is permanently incorporated into a transportation facility;
2. There is a temporary occupancy of land that is adverse in terms of the Section 4(f) statute's preservationist purposes; or
3. When there is a constructive use of land.... Constructive use occurs when the proximity impacts of a project on an adjacent or near-by Section 4(f) property, after incorporation of impact mitigation, are so severe that the activities, features, or attributes that qualify the property for protection under Section 4(f) are substantially impaired. Substantial impairment occurs when the protected activities, features, or attributes of the Section 4(f) property are substantially diminished." (*FHWA Section 4(f) Policy Paper, July 2012, page 33*)

Section 2.8 discusses historic sites. While there are no designated parks or recreational lands on Airport property, there are several parks and recreational resources in the immediate Airport vicinity, as well as sites on or eligible for the National Register of Historic Places within the cities of SeaTac, Burien, Des Moines, Normandy Park, Tukwila and Kent. These resources would be mapped and evaluated during any subsequent project-related environmental review process.

2.6 Farmlands

Throughout the 20th century, the nation's prime and unique farmland has decreased dramatically because of urban development throughout the country. In response, the Natural Resource Conservation Service (NRCS) has attempted to identify and preserve such land for agricultural purposes. The Farmland Protection Policy Act (FFPA) of 1981 was enacted to minimize the extent to which federal programs contribute to unnecessary and irreversible conversion of farmland to nonagricultural uses.

No farmland exists on Airport property.

2.7 Hazardous Materials, Pollution Prevention, and Solid Waste

2.7.1 Hazardous Materials

Many businesses generate hazardous waste in their business processes. If hazardous waste materials are handled or stored improperly, they can be released to the environment and have adverse effects. During the preparation of the 2007 Comprehensive Development Plan EA, a review of known hazardous waste sites was conducted. Twenty-eight documented release sites were identified. Releases to soil generally are limited in lateral extent but can be affected when found on the site that is proposed for development/re-development. Releases to groundwater may extend farther away from

their source; contaminated groundwater could be affected by planned development even if the source is located beyond the project site boundary.

Potential release sites were identified based on the activities registered with regulatory agencies (such as having an underground storage tank), site activities evident from historical documentation (e.g., former service station) or current activity (e.g., tank farm). Port staff indicate that after the issuance of the CDP EA, additional releases have occurred. Table 2-3 identifies the number of hazardous materials sites that were identified in the 2007 Comprehensive Development Plan EA within and immediately adjacent to the Port of Seattle property. The Port has continue to track, monitor and investigate sites as they are identified. New data collected since 2007 will be incorporated comprehensively into the SAMP environmental review process.

2.7.2 Pollution Prevention

The Port’s Stormwater Pollution Prevention Plan is based on a 5-year cycle, with the current plan updated in 2015. The existing conditions of the Stormwater Detention System (SDS), Industrial Wastewater System (IWS), and Industrial Wastewater Treatment Plant (IWTP) would be discussed further in subsequent environmental review process documentation.

No properties were listed on the National Priorities List (NPL) when the Comprehensive Development Plan EA was prepared.

**Table 2-3
Number of Hazardous Waste Sites within and Immediately Adjacent to the Port of Seattle Property
Seattle-Tacoma International Airport**

Documented Release		Potential Release			Sites of Highest Concern (release to ground water)	
Petroleum	Complex	Underground Storage Tank	RCRA Generator	Historical	On Port Property	Adjacent
24	4	8	10	13	10	6

Source: Synergy Consultants, March 2018.

2.7.3 Solid Waste

The Port uses a centralized waste collection system divided between terminal and support, and airfield areas. Municipal Solid Wastes (MSW) collected in publicly and non-publicly accessible terminal and support areas are transported to central collection sites by contracted janitorial crews, tenants, and Airport Maintenance staff. The MSW is transported using tilt trucks, service carts, or similarly dedicated equipment and/or vehicles. Deplaned MSW collected from aircraft and airfield support facilities is transported to collection sites by airline staff, ground support staff, and other tenants.

Each centralized waste collection site has at minimum one compactor for commingled recyclables and one compactor for garbage. Additional containers for compostable material used cooking oil, scrap metal, and construction debris and garbage are located at various terminal loading docks and remote

collection sites. Multiple service providers, with Recology CleanScapes and Cedar Grove Composting handling the largest components, haul garbage, recyclables, compostable waste, and other wastes from compactors, drop boxes, and dumpsters in the Port’s central waste collection sites.

Table 2-4 identifies the waste generation and waste diversion from 2013 through 2016.

**Table 2-4
Terminal and Airfield Municipal Solid Waste (MSW)
Generation and Diversion
Seattle-Tacoma International Airport**

Year	Terminal MSW Generation (tons)	Terminal MSW Diversion Rate (percent)	Airfield MSW Generation (tons)	Airfield MSW Diversion Rate (percent)
2013	5,762	30%	2,136	10%
2014	6,144	31%	2,225	10%
2015	6,695	33%	2,551	9%
2016	7,328	32%	2,855	9%

Source: Synergy Consultants, March 2018.

The Port published the *Seattle-Tacoma International Airport Solid Waste Management Plan 2014*, which is an update to their Solid Waste Management Plan (SWMP), on June 30, 2015. This document is consistent with the *Federal Aviation Administration’s 2014 Guidance on Airport Recycling, Reuse, and Waste Reduction Plans*. The SWMP update documents existing Port conditions, identifies and evaluates opportunities to further reduce Port waste, and recommends specific strategies to help the Port achieve its waste reduction and recycling objectives. In 2016, the Port completed its *Solid Waste Generation Forecast and Capacity Analysis*.

Hazardous materials, pollution prevention, and solid waste will be analyzed in the SAMP Environmental Review process and include the Airport and regions ability to dispose of waste materials generated.

2.8 Historical, Architectural, Archaeological, and Cultural Resources

The Near-Term Projects do not anticipate the need for the acquisition of land near the Airport, and thus, the evaluation of historic, architectural, archaeological and cultural resources was limited to Port owned land. Impacts beyond airport property would be evaluated in subsequent project-related environmental review.

The most recent evaluation of possible historical, architectural, archaeological and cultural resources located on Port land at the Airport was conducted for the Comprehensive Development Plan EA in 2007. Given that criteria for consideration of sites to be historic includes age of the facility, the 2007 data are dated. However, subsequent project-level NEPA and SEPA evaluations have been completed since 2007. These NEPA and SEPA evaluations, including the 2007 CDP data, will be used as the baseline in addition to a re-evaluation that will occur within the SAMP Environmental Review process.

As is noted later in Chapter 3, before alteration of facilities of 50 years or more, the Port will consult with the State Historic Preservation Officer.*

The Washington Information System for Architectural and Archaeological Records Data (WISAARD) was searched to identify properties located On-Airport.** Due to its architectural style (Modern Brutalism), significance, and construction technique, Sea-Tac Airport Parking Garage is under consideration as a historic property. Because this property has been deemed eligible for the National Register of Historic Places (NRHP) through the WISAARD, consultation under Section 106 applies which would be completed during the SAMP Environmental Review process.***

One historical resource within the Airport environs, the Angle Lake School, had previously been determined eligible for listing on the NRHP. A fire occurred at this site and the structure was destroyed after the 2007 Comprehensive Development Plan EA. However, prior to the fire, the property was slated for demolition and was documented per the State Historic Preservation Office and Washington State Historic Register (WHR) requirements (Port of Seattle SEPA No. 08-08). There were no other known historical resources listed in, or eligible for, the NRHP or WHR on Airport lands noted in the Comprehensive Development Plan. The Sea-Tac Main terminal was evaluated for historic listing in 2005 and was determined not to be eligible for listing on either the NRHP or the WHR.****

A record search at Department of Archaeology and Historic Preservation (DAHP) did not identify any previously recorded archaeological sites within Airport land. Airport land was noted in the Comprehensive Development Plan as having a low probability for unknown or intact archaeological resources. Surface reconnaissance in 2000 did not result in the detection or recording of any archaeological resources.*****

There are no known Native American cultural resources including traditional cultural places on Airport property. However, tribal consultation will occur during the SAMP Environmental Review process.

2.9 Land Use

Existing land use immediately north of the Airport is a mixture of airport-related development, commercial, and single- and multi-family residential development. To the south of the Airport there is open space, single-family residential, a number of large areas of multi-family residential, and public facilities uses. Immediately east of Sea-Tac Airport, specifically along International Boulevard (SR-99), there is commercial development with a mixture of multi-family residential; further east the land use is primarily single-family residential with a mixture of multi-family residential, commercial, and

*Section 106 of the Historic Preservation Act of 1966, site that are 50 years and older may be eligible for listing on the National Register of Historic Places.

**<https://fortress.wa.gov/dahp/wisaard/>

***While eligible for the NRHP, it has not been placed on the NRHP.

****<https://fortress.wa.gov/dahp/wisaard/dahpreports/historicpropertyreport.aspx?id=41705&ug=1>

******Port of Seattle, Seattle- Tacoma International Airport Master Plan, Proposed Third Runway Archaeological Resources and Traditional Cultural Places Assessment, King County Washington.* Department of Archaeology and Historic Preservation, by DR Iverson; Olympia, WA. 2000.

institutional land uses. West of the Airport is predominantly single-family residential development with commercial and institutional uses to the northeast and southwest.

The City of SeaTac surrounds Sea-Tac Airport and is approximately 3 square miles in area. The City adopted its first Comprehensive Plan in December 1994. The City updates its Comprehensive Plan to meet changing conditions and invites the public to participate in this process. At the same time, the City accepts proposals from the public for changes to the City's development regulations. Development regulations are the controls placed on development and use of land. These include the Zoning Code, the Subdivision Code, and related procedures.

The City of SeaTac and the Port of Seattle entered into an Interlocal Agreement (ILA) concerning several issues of importance to the 1997 Master Plan Update, one of which was land use and zoning. The original ILA was adopted on September 4, 1997 and last updated and approved on December 12, 2017. The Agreement includes provisions for the inclusion of the zoning districts in the City of SeaTac's zoning ordinance reflecting the zoning responsibilities relative to Airport land in the City of SeaTac. Chapter 3 of the 2018 Agreement addresses Land Use and Development standards; Chapter 4 discusses Transportation.*

In June 2015, City of SeaTac adopted an update to its municipal comprehensive plan and in December 2017 completed amendments.** The current adopted Plan identifies Sea-Tac Airport as an essential public facility and contains land use and transportation policies for the area immediately surrounding the Airport.

2.10 Noise and Noise Compatible Land Use

Noise is an inherent byproduct of aircraft operations and thus, it is the most common environmental impact encountered at airports. Airport-related noise emanates primarily from aircraft takeoffs and landings. Taxiing aircraft, engine maintenance, and other ground operations also contribute to ambient noise levels. The impact of aircraft noise on neighboring communities is usually analyzed in terms of the extent to which the noise annoys people by interfering with their normal activities, such as sleep, relaxation, speech, television, school, entertainment, and business operations. When noise occurs at night (between 10:00 pm and 7:00 am), and those sound levels exceed 65 decibels, individuals report a noticeable increase in annoyance. For this reason, the federally-agreed upon and approved method for assessing noise assigns an additional weight to sounds occurring at night.

Airport Noise Compatibility Planning (14 CFR Part 150) is the primary federal regulation that guides planning for aviation noise compatibility on and around airports. Part 150 establishes a standard noise forecasting methodology and metric, specifies a simulation model, and identifies land uses that are normally compatible or incompatible with various levels of airport noise. The Port of Seattle was one of the first airports to participate in the Part 150 Study process and has completed numerous updates to its original study, such as the one approved by FAA in 2014.

*The 2019 Interlocal Agreement dated December 5, 2017 is available at http://meetings.portseattle.org/portmeetings/attachments/2017/2017_12_12_RM_6b_attach.pdf
***City of SeaTac Comprehensive Plan*, December 2017. <http://www.ci.seatac.wa.us/index.aspx?page=600>

The FAA has adopted the Day-Night Average Sound Level (DNL) as the single system for determining cumulative noise exposure of individuals to airport noise. DNL is the 24-hour average sound level, in decibels, obtained from the accumulation of all events over a one-year period, with 10 decibels added to sounds occurring between 10 p.m. and 7 a.m. The weighting of nighttime events accounts for the increased annoyance that most residents have associated with noise during the night, when ambient levels are lower, and people are trying to sleep.

Noise contours using DNL were prepared for year 2016 using the FAA’s AEDT 2c Service Pack 2. Table 2-5 below summarizes the noise sensitive resources within each of the noise contours. Figure 2-2 shows the noise contours. The 2016 noise contour is larger than the noise contours depicted on the official Noise Exposure Maps, prepared for the most recent Part 150 Noise Compatibility Study Update. The growth in the noise contours is due to growth in aircraft activity occurring notably faster than predicted. However, the 2016 noise contours remain within the original Noise Remedy Boundary, where the Port has offered all eligible residential properties some form of noise mitigation in the past. The residences noted in the table include those that have participated in the Noise Remedy Program. As the Noise Remedy Program advances, communication with impacted properties and their owners will continue.

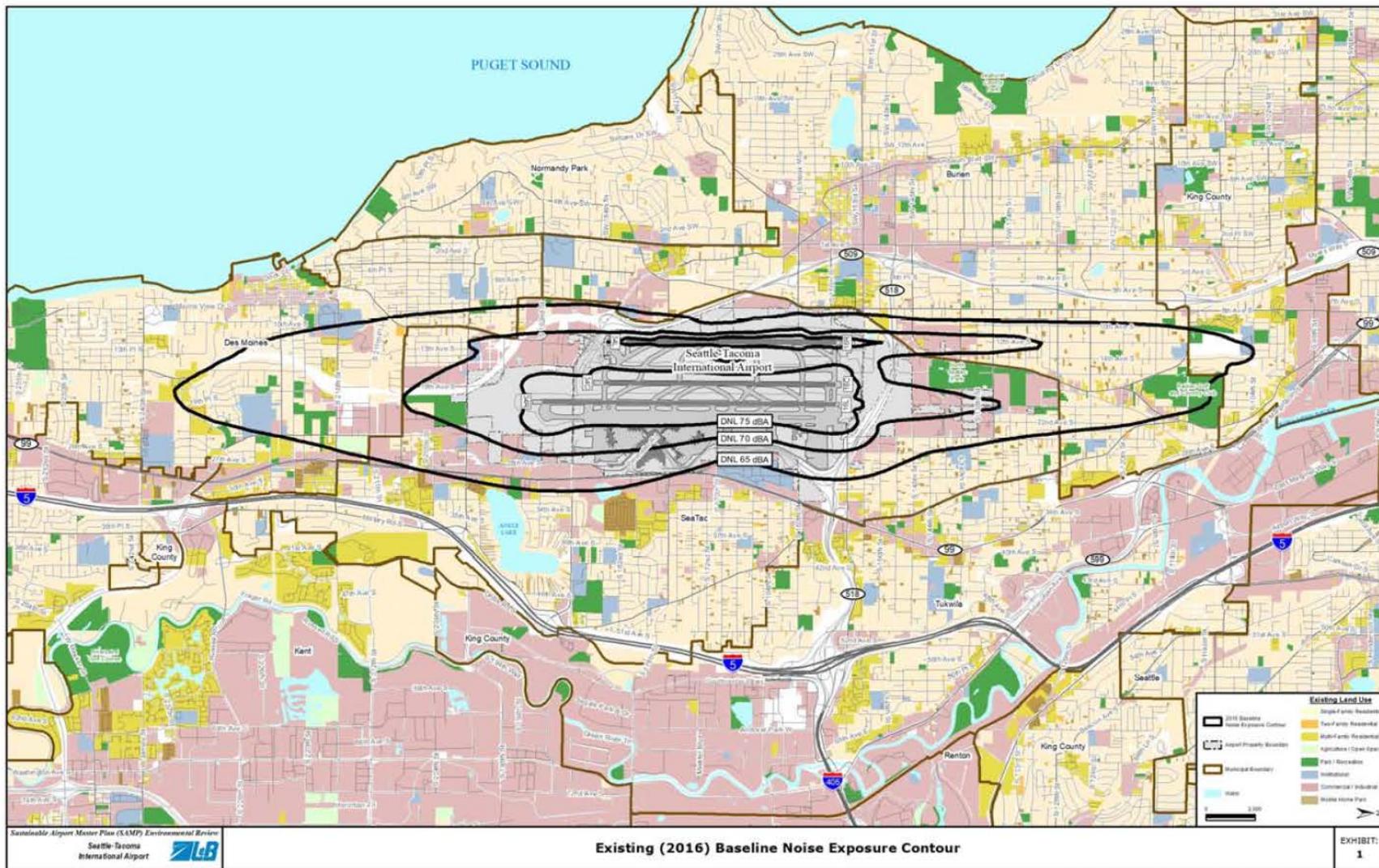
**Table 2-5
Noise Exposure Impacts (2016)
Seattle-Tacoma International Airport**

	65-70 DNL	70-75 DNL	75+ DNL	65 DNL & Greater
People	11,171	218	0	11,389
Residences	4,313	81	0	4,394
Schools	5	0	0	5
Churches/Places of worship	10	0	0	10
Hospitals/Nursing homes	0	0	0	0
Libraries	2	0	0	2

Note: Residences counted include those that have participated in the Noise Remedy Program

Source: 2016 data: Landrum & Brown, March 2018 using 2010 US Census block data.

Figure 2-2
2016 Noise Contours
 Seattle-Tacoma International Airport



2.11 Socioeconomic Impacts

Sea-Tac Airport is located in King County, Washington. The population of the state of Washington in 2014 was estimated at over 7 million people, with nearly 30% of the state's population residing in King County (nearly 2.1 million people). The per capita personal income in 2013 of residents in King County was nearly \$63,000 per year.* Population of the Central Puget Sound Region, consisting of King County and 3 other counties, is nearly 3.9 million people, which is expected to increase to 4.9 million by 2030 (a 26% increase over 15 years).**

This Environmental Overview focused on-Airport direct effects. There are no environmental justice populations on Airport land nor are there any schools or childcare facilities. During any subsequent project-related environmental review process, off-Airport environmental justice populations and schools/childcare facilities would be identified. In addition, surface traffic was beyond the scope of this analysis and would be addressed in the SAMP Environmental Review process.

The primary socioeconomic impact that Sea-Tac Airport exerts is related to the jobs, payroll, business expenditures and total regional economic contribution of Airport-related activities. In 2018, the Port of Seattle completed an update to the Port's economic impact study that specifically identified the impacts associated with Sea-Tac Airport. That study found that Sea-Tac Airport contributes the following socioeconomic impacts:***

- 151,400 jobs, including 19,100 jobs on site
- \$3.7 billion in total compensation
- \$11.5 billion in business revenue
- \$506 million in state and local taxes

2.12 Water Resources

The Airport lies within four local stream basins, the Des Moines Creek, Miller Creek, Walker Creek, and Gilliam Creek basins. Des Moines, Walker, and Miller Creeks drain to Puget Sound. Gilliam Creek drains to the Green River located 2-3 miles east of Sea-Tac Airport. Figure 2-1 shows the locations of the water resources in the Airport environs.

The Des Moines Creek basin covers approximately 3,600 acres, including most of Sea-Tac Airport and the Cities of SeaTac and Des Moines. The Miller Creek basin (including Walker Creek as a sub basin) covers approximately 4,800 acres and includes a small portion of the Airport and parts of the Cities of SeaTac and Burien. Walker Creek, draining about 900 acres, originates on the west side of the Airport and joins Miller Creek a short distance upstream from the confluence with Puget Sound to the west of the Airport. The Gilliam Creek basin covers over 1,800 acres within the Cities of Tukwila and SeaTac.

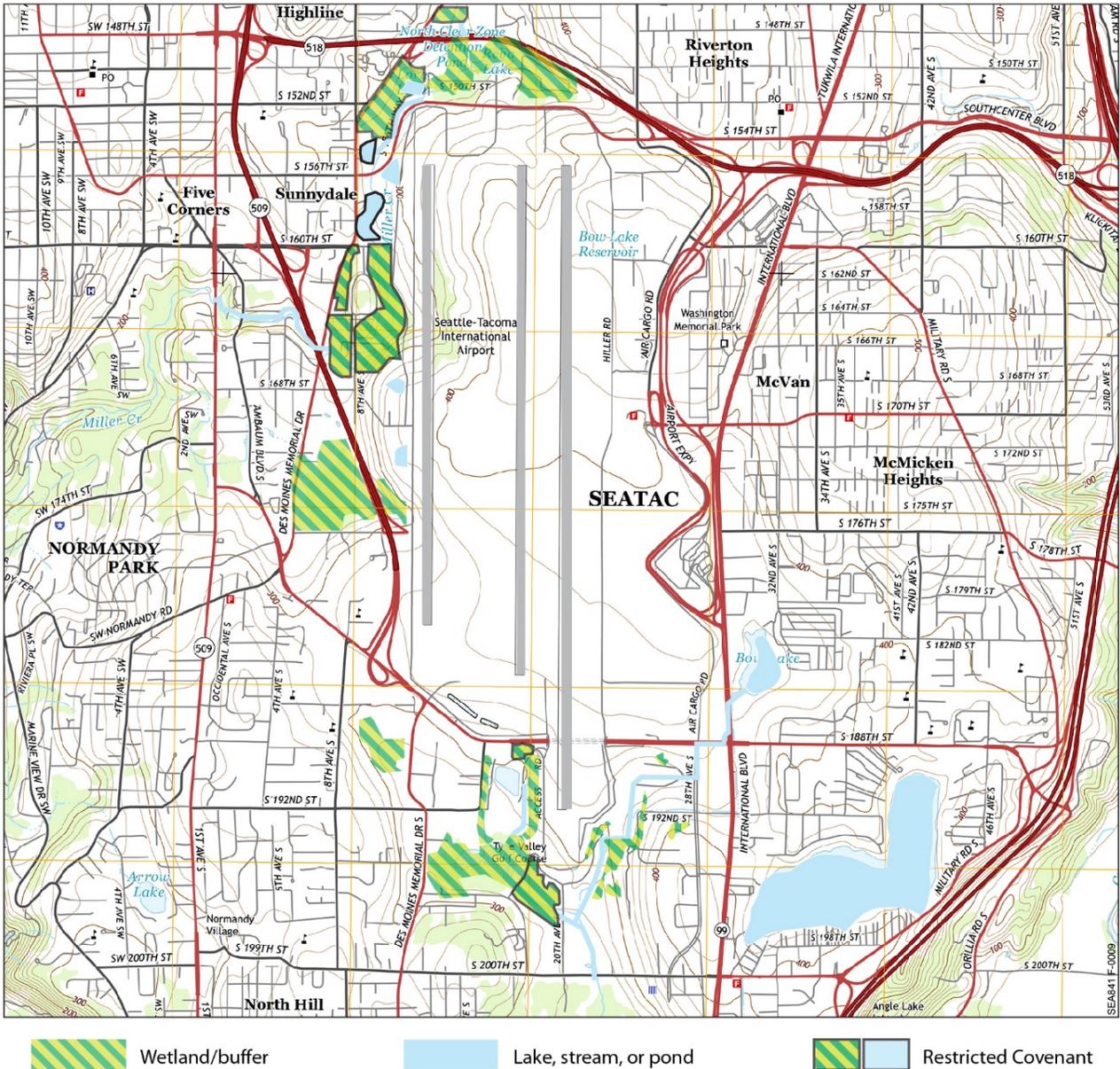
*Port of Seattle, Consolidated Annual Financial Report, 2014.

**Puget Sound Regional Council at <http://www.psrc.org/data/regionalprofile/regionalprofile-pop>

***Sea-Tac International Airport Economic Impacts, Community Attributes Inc., January 2018.

Runoff from a small area in the northeast portion of the Airport drains to the upper portion of Gilliam Creek, which drains to the Green/Duwamish River. Most of the Airport is in the Des Moines and Miller Creek basins.

Figure 2-1
Lakes, Streams, Ponds, and Wetlands in the Airport Vicinity
 Seattle-Tacoma International Airport



Source: Port of Seattle.

2.12.1 Floodplains

Federal, state, and local development regulations prohibit substantial floodplain encroachment and reduction of flood storage capacity. Executive Order 11988, *Floodplain Management*, requires federal agencies to avoid adverse impacts on floodplains and their natural and beneficial values (CFR 1977). USDOT Order 5650.2, *Floodplain Management and Protection*, outlines USDOT's policies and procedures for implementing Executive Order 11988. Order 5650.2 is intended to ensure that "proper consideration is given to the avoidance and mitigation of adverse floodplain impacts in agency actions, planning programs, and budget requests." Any act that may affect a floodplain (at a minimum, the 100-year floodplain) must be reviewed for compliance with Executive Order 11988. The 100-year floodplain refers to an area, often low land adjoining a river, stream, or water body, which is covered by water during the flood event that has a one percent chance of being equaled or exceeded in magnitude in any given year. In addition, the FEMA-delineated floodway (defined as the portion of the floodplain within which water is deep and fast moving) should be kept free of fill material and obstructions, such as buildings, to allow floodwaters to move downstream and to prevent flood heights from increasing.*

Where floodplains and floodways have not been designated, the Washington Administrative Code requires that the best available information from federal, state, or local sources be considered to ensure that the cumulative effect of existing, proposed, and anticipated future development would not increase the water surface elevation of the base flood more than one foot at any point in the community (WAC 173-158-070). In addition, local ordinances prohibit placement of structures with the lowest floor elevation below the flood protection elevation (i.e., an elevation that is one foot above the "base flood" [100-year flood] elevation), or where the structures might be at risk due to stream bank destabilization.**

Current 100-year floodplain information for the area surrounding the Airport was compiled from the Port's 2007 Comprehensive Development Plan EA. Floodplain areas of interest in the Des Moines, Miller, Walker, and Gilliam Creek basins were identified for the mapped 100-year floodplains and floodways shown in Figures 2-3. This information will be updated during the SAMP environmental review process.

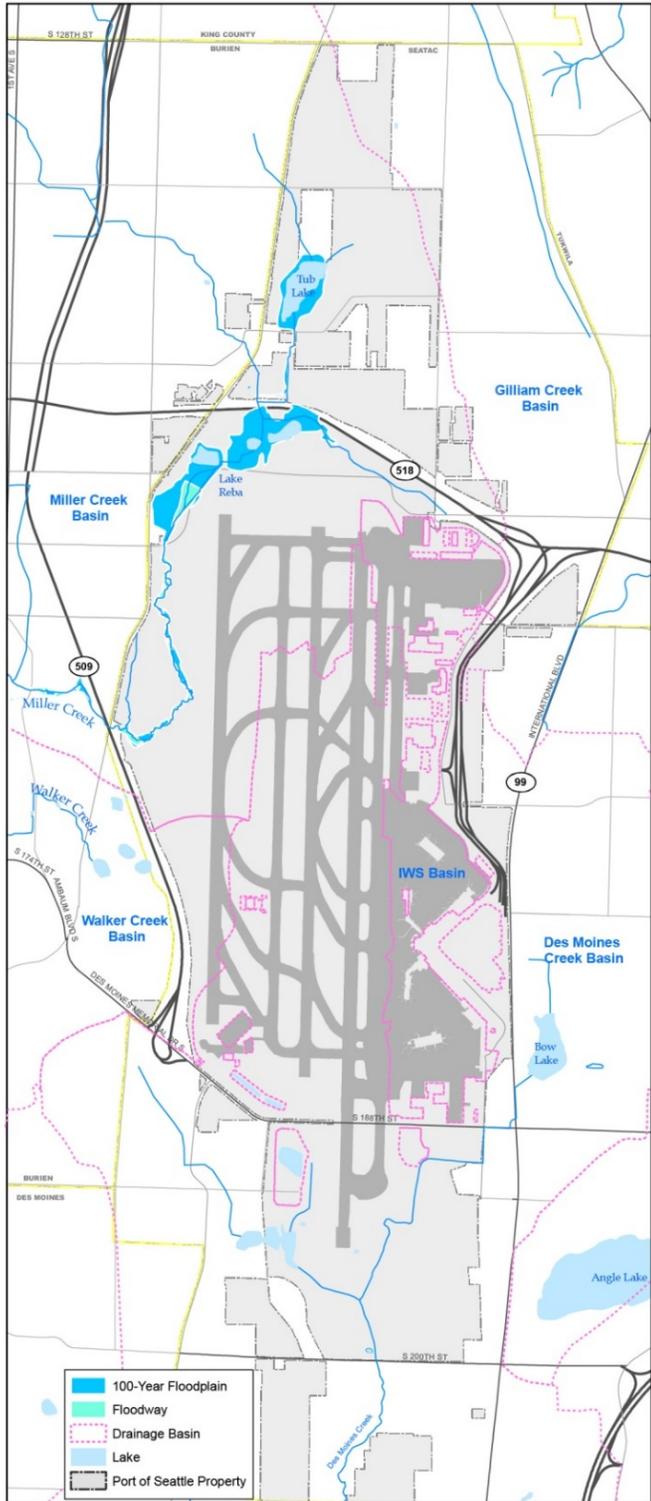
As is shown in Figure 2-3, 100-year floodplains associated with Miller Creek and its tributaries are located directly north/northwest of the approach end of Runway 16R. Similarly, south of S. 188th Street, west of International Boulevard, prior maps of the area indicate a floodplain associated with Des Moines Creek and the West Fork of Des Moines Creek. The Des Moines Creek system on Port property is within a constructed flood control facility that included three control structures, one on the east fork and two on the west fork.

*Federal Emergency Management Agency (FEMA). 2004b. Information on Executive Order 11988 – Floodplain Management [online]. Updated October 22, 2004.

**City of Burien Municipal Code, Critical Areas, Section 19.40.240-260

<http://www.codepublishing.com/WA/Burien/?Burien19/Burien19.html>; City of SeaTac Municipal Code, Environmentally Sensitive Areas Section 15.700 <http://www.codepublishing.com/WA/SeaTac/>

**Figure 2-3
Floodplains in the Airport Vicinity
Seattle-Tacoma International Airport**



Source: Port of Seattle Comprehensive Development Plan, POS SEPA No. 07-09, Environmental Review/NEPA Environmental Assessment (2007)

Stormwater regulations also exist to protect flood-prone areas. To address on-site detention requirements, the Comprehensive Stormwater Management Plan for the Airport,* along with the subsequent plan updates for the Des Moines Creek basin** and the Miller and Walker Creek basins,*** specifies detention requirements for projects within the Des Moines, Miller, and Walker Creek basins. The Port's 2008 *Stormwater Management Manual* also sets forth the measures necessary to control the quantity and quality of stormwater produced by new development and redevelopment.

2.12.2 Water Quality

The Port operates and maintains an Industrial Wastewater Treatment Plant (IWTP). The conveyance system to this treatment plant is through the Industrial Wastewater System (IWS). The IWS and the treatment plant were initially built in the early 1960s. They have been the subject of a National Pollution Discharge Elimination System (NPDES) permit since 1980. There have been major and minor modifications to these Permits during each permit cycle.

Stormwater drainage at Sea-Tac Airport is separated into two different collection systems: the IWS and the SDS. The IWS collects stormwater from the approximately 375 acres where industrial activities are conducted. IWS collected stormwater is treated in the Industrial Waste Treatment Plant before being discharged through an individual outfall in accordance with the Port's NPDES Permit. The SDS collects stormwater from the remaining approximately 1,200 acres. The stormwater drainage is conveyed to Lake Reba and subsequently to Miller Creek to the north, to the Northwest Ponds and Des Moines Creek to the south, and Walker Creek to the west; the discharge is through specific outfalls identified in the NPDES Permit.

Des Moines and Miller Creeks have historically had water quality problems and are listed on the Washington State Department of Ecology Clean Water Act Section 303(d) list of impaired waters. The 2016 303(d) listing notes Des Moines Creek violations of dissolved oxygen, bacteria, and copper.**** It also notes violations of copper and Zinc for Miller Creek in the immediate Airport vicinity.*****

Urban development within the drainage basins surrounding Sea-Tac Airport has altered the size and function of the historic floodplains and contributed to the current floodplain configurations. These alterations have contributed to flooding by reducing channel capacity and floodplain storage in many areas. In Des Moines Creek, past wetland-fill and undersized drainage facilities from regional development have contributed to localized flooding near South 216th Street and two tributaries that

*Comprehensive Stormwater Management Plan, Master Plan Update Improvements, Seattle-Tacoma International Airport. Prepared for Port of Seattle by Parametrix. Bellevue, WA. December 2000 with July 2001 Updates

**Proposed Design Refinements to the Comprehensive Stormwater Management Plan, Master Plan Update Improvements for Seattle-Tacoma International Airport: Des Moines Creek. Prepared for Port of Seattle by Parametrix. Bellevue, WA. December 2004.

***Seattle-Tacoma International Airport: Miller-Walker Creek. Prepared for Port of Seattle by Parametrix. Bellevue, WA. June 2005.

****Department of Ecology web site <https://fortress.wa.gov/ecy/wqamapviewer/CandidateList.html>

*****Department of Ecology web site <https://fortress.wa.gov/ecy/wqamapviewer/CandidateList.html>

enter Des Moines Creek near South 200th Street.* In Miller Creek, flooding has been reported between Southwest 150th Street and Southwest 152nd Street, just west of Des Moines Memorial Drive, upstream from Southwest 160th Street, and elsewhere throughout the basin where debris in residential back yards has constrained streamflow. In Gilliam Creek there are relatively few documented problematic flooding areas despite the extensive amounts of development within the basin. One location of potentially problematic flooding is the Gilliam Creek culvert that passes under 42nd Avenue South on the north side of SR 518.**

In the Puget Sound Region, principal aquifers have been formed within sand and gravel deposits of glacial drift. Zones of shallow, perched groundwater that are not continuous are also commonly encountered above glacial till deposits. Several regional aquifers underlie Sea-Tac Airport. Water in the shallowest aquifer rises to within 50 or 60 feet of the ground surface near the passenger terminal and discharges to creeks at the ground surface at lower elevations to the north, south, and west.*** Additional aquifers extend to a depth well below sea level as noted in the CDP EA.

King County, the Highline Water District, and the City of Seattle operate municipal wells drawing from several of these aquifers. The Highline Water District and King County supply wells are located one mile or more south of the Airport runways. The Highline Water District also has a well (Tyee well) on Port property approximately one-half mile south of the airfield. This well is intended to supplement creek water supplies during summer peak demand.**** The City of Seattle operates wells located north of the Airport. The wellhead protection area of two of these wells extends over Port-owned property located just north of SR 518. During the 1997 Master Plan Update, the Port and the City of Seattle Public Utilities developed a memorandum of agreement regarding construction and operation activities for the Port's planned development in the wellhead protection area to prevent infiltration of pollutants into the aquifer.*****

2.12.3 Wetlands

According to the 2007 Comprehensive Development Plan EA, a total of 111 existing wetlands were identified on Airport lands, including native wetlands, farmed wetlands, jurisdictional ditches, and other waters of the United States. Existing wetlands ranged in size from approximately 0.003 to 35.4 acres, with a total area of approximately 132 acres. Wetlands were further characterized by vegetative cover and include 21 forested wetlands, 13 scrub-shrub wetlands, 28 emergent wetlands, 2 riverine wetlands, and 2 open water wetlands. The remaining wetlands consisted of 6 other waters of

**City of Normandy Park Surface Water Management Plan*. Prepared for City of Normandy Park by RW Beck. Seattle, Washington, 1992.

***City of Tukwila Comprehensive Surface Water Management Plan*. By CH2M Hill and Herrera Environmental Consultants, November 2003; *City of Tukwila, Gilliam Creek Basin Drainage Study*. Prepared for City of Tukwila by KCM, 1986.

****Seattle-Tacoma International Airport Draft Phase 1 Groundwater Study Report*. Prepared for Port of Seattle by Aspect Consulting, LLC. Bainbridge Island, WA. February 15, 2005.

*****Seattle-Tacoma International Airport Draft Phase 1 Groundwater Study Report*. Prepared for Port of Seattle by Aspect Consulting, LLC. Bainbridge Island, WA. February 15, 2005.

******Agreement Between the City of Seattle and the Port of Seattle for Sea-Tac Airport Proposed North Employee Parking Lot Environmental Issues*. May 17, 1997.

the United States, including ditches and channels; 7 farmed wetlands; and 32 wetlands that fell into multiple categories.

Wetlands on Port-owned land at Sea-Tac Airport included wetlands north of SR518, south of SR 518 but north of the airfield, wetlands west of the airfield along Miller Creek, and wetlands south of S. 188th Street. Figure 2-2 shows the locations of known wetlands. In 1997, the Port received FAA approval to complete the elements of the Master Plan Update which included the construction of Runway 16R/34L. The Master Plan Update required the filling of approximately 18.4 acres of wetland: Runway Safety Area correction (0.14 acre); Runway 16R/34L (14.23 acres); Borrow area for runway platform (1.10 acre); SASA (2.78 acres), and off-site mitigation (0.12 acre). The Port then prepared its 2000 Natural Resource Mitigation Plan* that documented mitigation, performance monitoring, maintenance and contingency actions to mitigate for the project effects.

The mitigation plan focused on compensatory mitigation actions that would replace wetland and stream functions impacts in the same basin as the impacts occurred. Off-site mitigation was provided for those functions that would conflict with the safety needs of the Airport. Figure 2-1 shows the locations of mitigation completed in the Miller, Walker and Des Moines Basins. That area, shown in black, consists of restricted covenants concerning mitigation sites that were designed to prohibit mitigation sites redevelopment. In Miller Creek, the on-site mitigation was designed to: restore and enhance native, forested riparian buffer and to protect and improve the aquatic habitat; and establish a large, contiguous, protected riparian habitat corridor connecting the upper and lower reaches of Miller Creek; restore fish and aquatic habitat. The Natural Resource Mitigation Plan contained specific vegetation planting plans. In addition to terrestrial and aquatic habitat, mitigation included summer Low Flow augmentation on Walker and Des Moines Creek--for which the Port pumps groundwater into the creek to supplement baseflow—and on-site floodplain creation and enhancement as well as off-site (Auburn/Green River) floodplain creation.

Similarly, in the Des Moines Creek Basin, mitigation consisted of restoring native wetland shrub communities (about 6 acres) and enhancing aquatic habitat and stream functions by restoring forested riparian buffers. Like the Miller Creek mitigation, mitigation in Des Moines Creek is subject to a restrictive covenant to protect the mitigation site from development pressures.

2.12.4 Wild and Scenic Rivers

No wild and scenic rivers, as designated in the Wild and Scenic Rivers Act, as amended (16 United States Code [USC] 1271 et seq.), are in the Airport area.

*Master Plan Update Improvements, Seattle-Tacoma International Airport, *Natural Resource Mitigation Plan* prepared by Parametrix for the Port of Seattle, December 2000.

Chapter 3: Potential Effect of the Near-Term Master Plan Recommendations

This chapter identifies the potential environmental resources that could be affected by the Near-Term Projects identified in Chapter 1. As an Environmental Overview, the impacts presented here are not at the same level of detail as will be found in the pending SAMP Environmental Review process but rather provide an overview of potential direct impacts of the proposed Near-Term Projects; indirect effects were beyond the scope of the review.

The Environmental Overview is not a replacement for the analysis associated with environmental review and compliance under NEPA and SEPA. Rather, the scope for this Environmental Overview relies on existing published environmental conditions and qualitative estimates of the effects of the SAMP Near-Term Projects.

3.1 Resources Not Expected to be Affected

Based on the Near-Term Projects noted in Chapter 1.3 and the conditions noted in Chapter 2, an overview of the potential effects of the Near-Term Projects were identified. While not to the depth and degree required by FAA Order 1050.1F and SEPA WAC 197-11 for an environmental review process, the analysis for this technical memorandum provides an overview of potential direct project effects.

The proposed Near-Term Projects, occurring on existing Airport land, is not be expected to change future conditions for the following resources:

- Coastal Resources: There are no identified coastal resources on Airport property.
- Farmlands: No farmland exists on Airport lands.
- Land Use: Acquisition of land is not anticipated and the proposed Near-Term Projects are consistent with zoning.

While the Near-Term Projects are not expected to have an effect on the above resources, the analysis that will be undertaken in compliance within the SAMP Environmental Review process to identify effects, if any.

3.2 Resources that Could Be Affected

The following sections identify potential effects of the proposed Near-Term Projects and, if known, any permits and approvals that may be anticipated. For purposes of this report, the “With Project” refers to completion of the Near-Term Projects, whereas the “Without Project” or No Action assumes that no further improvements would occur beyond those already approved.

3.2.1 Air Quality

The construction and operation of the recommended Near-Term Projects would be expected to produce emissions of criteria pollutants. It was beyond the scope of the Environmental Overview to quantify emissions. Table 2-2 shows the existing emissions which were identified based on operations in 2016.

During construction, emissions would be expected from site preparation, building construction, materials delivery, and construction employee commute. These emissions would be temporary and end once construction is completed. Once completed, ongoing operational emissions would be expected from aircraft, ground support equipment, passenger surface traffic vehicles, parking, and stationary equipment. During the project-related environmental review within the SAMP Environmental Review process, an emissions inventory will be prepared for criteria pollutants for the No Action and the for the Near-Term Projects (i.e. With Project) conditions in 2027 and 2032.

Because Sea-Tac Airport is in an area designed as attainment for all pollutants but is subject to a maintenance plan for carbon monoxide, before the FAA can approve the recommendations, the projects must be first shown to conform to the carbon monoxide State Implementation Plan (SIP). It is expected that the Near-Term Projects may be subject to the General Conformity provisions of the Clean Air Act as defined in 40 CFR Part 93. A General Conformity Analysis, if required, will require preparation of an emissions inventory to determine if the rule is applicable (i.e. an applicability analysis) based upon whether total direct and indirect emissions are less than the de minimis thresholds. If emissions would be greater than the de minimis threshold, a conformity determination is be required.

3.2.2 Biological Resources (Fish, Wildlife, and Plants)

Much of the land that would be impacted by the Near-Term Projects is developed and impervious. However, the Westside Maintenance Campus (S07) and development north of State Route 518 (previously discussed Centralized Receiving and Distribution Center, employee parking garage, North Ground Transportation Lot, and the cargo development on the L-Shaped parcel) are partially or fully undeveloped. While no known endangered species of fish, plants, or wildlife are known to inhabit these areas, during the SAMP Environmental Review process, agency consultation may be needed under Section 7 of the Endangered Species Act relative to the Westside Maintenance Campus and parcels north of SR 518. Consideration will also be given to potential downstream effects, if any. The specific type of analysis that would need to be completed will be determined in consultation with the appropriate agencies such as the U.S. Fish & Wildlife Service/NOAA.

3.2.3 Climate

It is expected that the construction and operation of the recommended Near-Term Projects will require energy, and, thus produce air and greenhouse gas emissions. It was beyond the scope of the Environmental Overview to quantify Near-Term Projects project-related greenhouse gas emissions. Table 2-3 shows the existing greenhouse gas emissions which were identified based on operations in 2016.

Energy resources would be required to power equipment necessary to build the Near-Term Projects. Like the criteria pollutant emissions, energy associated with site preparation, materials delivery, equipment for facility construction, and construction worker commute would occur. These construction emissions would be temporary and stop, once construction is completed. Once constructed, the new facilities would consume electrical power, and sources operating at the new facilities would consume electrical power, diesel, gas, natural gas, and compressed natural gas (CNG). For the SAMP Environmental Review process, air quality and climate will be addressed uniquely per FAA and Washington State Department of Ecology guidance.

3.2.4 Hazardous Materials, Pollution Prevention, and Solid Waste

Construction of the recommended Near-Term Projects has the potential to generate and expose hazardous materials through demolition of existing Port-owned buildings and excavation of past ground contamination. Operation of new facilities could also lead to release of materials associated with vehicle operations, cleaning, or maintenance. The Port's established policies and procedures intend to prevent impacts on soil or water and will be identified in detail in the SAMP Environmental Review process.

Construction would produce construction debris. In addition, during operation of the Near-Term Projects, an increase in solid waste would be expected. During the SAMP Environmental Review process, the effects of this additional waste and its disposal to landfills will be considered.

3.2.5 Historical, Architectural, Archaeological, and Cultural Resources and Department of Transportation Act: Section 4(f)

Based on past evaluations, only one architectural site may be affected directly by the recommended Near-Term Projects: The Main Terminal parking garage. The parking garage has been determined eligible for the NRHP as noted in Chapter 2, and thus effects will be considered relative to Section 106 and DOT 4(f) during the SAMP Environmental Review process. Coordination is warranted with the State Historic Preservation Office relative to architectural importance of the Main Terminal parking garage once the indirect effects are identified in the SAMP Environmental Review process. FAA would conduct the Section 106 consultation and government to government consultation.

The Westside Maintenance Campus (S07) occurs on previously disturbed lands and is not expected to affect archaeological and cultural resources. However, as part of the SAMP Environmental Review process, this will be re-analyzed and updated. In contrast, projects S10 (Centralized Receiving and Distribution Center), L05 (North Ground Transportation Lot), and L07 (Employee Parking Structure), which are located between S. 144th and S. 146th Street/east of 16th Ave, occur on land that is not

previously disturbed. However, both scenarios will require an archaeological and cultural evaluation as part of the SAMP Environmental Review process.

No parks, recreational or nature preserves would be directly affected and thus, no other elements that might be considered protected under the DOT Section 4(f) provisions would be expected. During the SAMP Environmental Review process, indirect effects would be examined, and compliance with DOT Section 4(f) and Section 106 consultation would be completed if applicable.

3.2.6 Light Emissions and Visual Impacts

The recommended Near-Term Projects may result in additional lighting at the Airport, largely associated with building lighting on the Westside Airport Maintenance Campus, and lighting for the facilities proposed north of SR518. Lighting associated with the Westside Campus will be analyzed in the SAMP Environmental Review process. For development north of SR 518, potential lighting and visual impacts would be addressed by adhering to the Interlocal Agreement (ILA) requirements, the agreement between the Port of Seattle and City of SeaTac. The ILA includes provisions for designing outdoor lighting that will be integrated into the Near-Term Projects. These provisions include reducing or eliminating glare and requiring fixtures that provide complete cutoff of light at a plane parallel to the ground to prevent light being projected into the sky where it can contribute to sky glow.

The recommended Near-Term Projects may produce visual conditions like conditions today and consistent with the presence of an airport when considering natural features, such as topography, effects of manmade structures and visual composition. Development of the Westside Maintenance area west of the airfield would be expected to occur at airfield level and thus not be highly visible on the west side but would be visible from higher areas located east of the Airport. This would be further explored in the SAMP Environmental Review process. Development of lands north of SR 518, near the existing North Employee Lot are not immediately adjacent light sensitive properties and would not be expected to have notable visual or light emission impacts. Such development would be consistent with the massing and character of the Airport. Nonetheless, the SAMP Environmental Review process will analyze and address any potential light impacts associated with future Near-Term Projects development.

Development of the L-Shaped parcels for cargo development are immediately adjacent to residential uses. The CDP Environmental Assessment contains a discussion of the visual and lighting impacts associated with the development of the L-Shaped parcels. Provisions of the ILA would serve to ensure that adverse effects are minimized. However, and as noted above, the SAMP Environmental Review process will analyze and address any potential light impacts associated with future Near-Term Project development; include the L-Shape parcels.

3.2.7 Energy Supply

Construction and operation of the recommended Near-Term Projects are likely to consume natural resources such as water, sand, gravel, and energy. Although the Port has adopted a Century Agenda goal requiring future increases in energy to be offset by energy conservation or renewables, there are no specific measures in place that would guarantee this goal is met for the Near-Term Projects.

Therefore, there may be increases in energy demand due to additional heating, cooling, and lighting of the proposed facilities. Total system usage would be studied in the SAMP Environmental Review process to better understand the context and intensity of the impacts.

3.2.8 Noise and Compatible Land Use

Construction of the Near-Term Projects would generate noise. Those temporary noise impacts would be identified in the SAMP Environmental Review process. As activity increases in the future, additional aircraft overflights, and potential aircraft noise impacts could increase. In addition, further analysis will be required to determine if, relative to the No Action, the Near-Term Projects would affect runway use or flight tracks. A detailed construction noise and operational noise analysis will be completed in the SAMP Environmental Review process to determine project-related impacts.

3.2.9 Socioeconomic Impacts, Environmental Justice, Children's Environmental Health Risk

Socioeconomic impacts are those factors that affect surrounding communities, such as shifts in patterns of population movement and growth, public service demands, and changes in business and economic activity to the extent influenced by the airport development. Implementation of the Near-Term Projects is not anticipated to acquire land, nor are they likely to relocate residences. Airport businesses (tenants) are the only business activities that would may be directly affected, and most displaced facilities are expected to be relocated within the Airport. During construction, additional construction employment would be generated and thus, expenditures in the local communities would increase from the expenditures of the construction workers. However, these changes would not be expected to result in shifts in population movement or growth.

Impacts of the Near-Term Projects to environmental justice populations and to children's environmental health risk would need to be addressed once an evaluation was conducted for noise, air quality, water, and surface transportation in the SAMP Environmental Review process.

3.2.10 Surface Transportation

The Near-Term Projects would alter on-airport surface transportation due to the changes in the on-Airport North Airport Expressway (project L01), second terminal roads/curbside (L03), and development north of SR 518. A surface transportation analysis was beyond the scope of this Environmental Overview. A detailed surface transportation analysis would be completed during the SAMP Environmental Review process. This analysis will also support and complement the air quality analysis.

3.2.11 Water Resources (Floodplains, Wetlands, and Water Quality)

The following elements of the proposed Near-Term Projects have the potential to affect water resources:

- Development within the wellhead protection areas (north of SR 518)
- Development of a Westside Maintenance Campus west of Runway 16R/34L

The City of Seattle and the Highline Water District draw water from aquifers within the Airport area to supplement their domestic water supply. Aquifers also function in helping to maintain stream flows and water levels in lakes and wetlands in the summer months. Land parcels north of SR 518 fall within the City of SeaTac wellhead protection areas.

The Westside Maintenance Campus proposed for the west side of the Airport could also affect wetlands and/or wetland buffers. Further site evaluation would need to assess the ability to avoid wetland impacts and if avoidance is not possible to minimize impacts. In addition, site evaluation would be needed to ensure Campus development complies with adjacent mitigation site restrictive covenant requirements. The West Maintenance Campus will likely result in an increase of impervious surface. The SAMP Environmental Review will assess possible impacts on local receiving waters including those related to stormwater runoff. At a minimum, the review will assess the ability and measure needed to comply with the Airport's National Pollution Discharge Elimination System (NPDES) permit. Measure may include on-site stormwater management such as those provided through low impact development, stormwater detention, and stormwater treatment.