FINAL

Environmental Assessment for the Sustainable Airport Master Plan Near-Term Projects

Seattle-Tacoma International Airport

Seattle, Washington

PREPARED FOR

Port of Seattle

U.S. DEPARTMENT OF TRANSPORTATION

FEDERAL AVIATION ADMINISTRATION

As lead Federal Agency pursuant to the National Environmental Policy Act of 1969

PREPARED BY

Landrum & Brown, Incorporated

September 2025

This environmental assessment becomes a Federal document when evaluated, signed, and dated by the Responsible FAA Official.

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ERRATA

Summary of Changes

The impact analysis in this Final Environmental Assessment (EA) considers the same Proposed Action that was analyzed in the Draft EA. The changes noted in this Errata result from several circumstances. First, the Federal Aviation Administration (FAA) considered the comments received from the public as well as state and federal entities on the Draft EA and made revisions and clarifications accordingly. Second, the FAA revised textual errors. Third, the FAA made several revisions based on regulatory changes and new National Environmental Policy Act (NEPA) case law. These revisions involve climate, environmental justice, and cumulative impacts. **Table A** lists changes by chapter and/or section.

Regulatory changes since the publication of the Draft EA includes the revocation of the following Executive Orders (EO): EO 11991, EO 12898, EO 13985, EO 13990, EO 14007, EO 14008, EO 14027, EO 14030, EO 14031, EO 14045, EO 14049, EO 14050, EO 14057, EO 14072, EO 14082, EO 14089, EO 14091, EO 14094, EO 14096, EO 14112, and EO 14124. In addition, Council on Environmental Quality (CEQ) revoked its regulations (40 Code of Federal Regulations [CFR] parts 1500-1508) implementing NEPA, 42 United States Code (U.S.C.) 4321 *et seq*., as amended, in response to EO 14154, *Unleashing American Energy*.

The Climate Protocol (Protocol) developed by the FAA and the Port of Seattle (Port) in coordination with the Puget Sound Clean Air Agency included the best scientific data and methods available to the FAA at the time the Protocol was developed and relied on FAA Orders 1050.1F and 5050.4B, FAA's Aviation Emissions and Air Quality Handbook, Version 3, Update 1, and the January 2023 CEQ draft Greenhouse Gas (GHG) guidance. After the publication of the Draft EA, EO 13990, which was relied upon for the January 2023 CEQ draft GHG guidance, was revoked. As a result of the revocation of the EO and CEQ regulations, all references to climate and the qualitative climate evaluation that discussed the level of preparedness with respect to the impacts of climate change, the extent to which the alternatives could be affected by future climate conditions, and if the alternatives are consistent with national, state, and local climate goals have been removed from the Final EA.

Regarding the environmental justice analysis, on January 21, 2025, President Trump issued EO 14173, *Ending Illegal Discrimination and Restoring Merit-Based Opportunity*. Based on the new EO and the revocation of CEQ regulations, it is no longer a legal requirement or the policy of the federal government to conduct environmental justice analyses. As a result, this Final EA has removed the prior discussion of, and data/analysis related to, environmental justice.

Finally, the CEQ regulations historically had required the consideration of cumulative impacts. In 2023, Congress passed the Fiscal Responsibility Act (FRA) which directed agencies to consider "the reasonably foreseeable environmental effects of proposed agency actions" (42 U.S.C. 4332(2)(C)). In addition, the Supreme Court issued the Seven County Infrastructure Coalition v. Eagle County, 605 U. S. 975 (2025) (Seven County) ruling on May 29, 2025. As a result of these actions, it is no longer a legal requirement or the policy of the federal government to conduct cumulative impact analyses. In addition, the Seven County ruling reinforced the limited scope of NEPA reviews, holding that NEPA does not require an agency to consider environmental effects of other activities and projects "separate in time or place" from the proposed action. Therefore, this Final EA has removed the prior discussion of, and data/analysis related to, cumulative impacts.

TABLE A: CHANGES TO THE DOCUMENT

Location of Revision in Draft EA Document	Revision	Reason for Revision
Entire Document		
	References to the CEQ NEPA regulations were removed from the document: Sections 1.1, 2.2, 4.3.8.1 Footnote 1 Table 3-12	Since the publication of the draft EA, the CEQ revoked its regulations (40 CFR parts 1500-1508) implementing NEPA, 42 U.S.C. 4321 et seq., as amended, in response to EO 14154. This environmental document relied upon the NEPA statute (42 U.S.C. 4321 et seq., as amended) and FAA Orders 1050.1F and 5050.4B. Therefore, the analysis contained in the Draft EA is sufficient for the FAA to determine if the implementation of the Proposed Action will result in significant impacts.
	Removal of following from the document: Table 3-7 – EO 13653 and EO 13693 Table 3-7 – National Environmental Policy Act (NEPA) Guidance on Consideration of Greenhouse Gas Emissions and Climate Change Table 3-36 – EO 13690	EOs were rescinded, revoked, or guidance was withdrawn.
	Added “reasonably foreseeable” Sections 3.2, 4.4.1, 4.3.2, 4.3.2.2, 4.3.5, 4.3.6, 4.3.7.1, 4.3.8, 4.3.9, 4.3.10, 4.3.11, 4.3.12, 4.3.13, and 4.3.14. Chapter 4, introductory paragraph Section 4.3, Table 4-2 title	The CEQ regulations historically had required the consideration of cumulative impacts. In 2023, Congress passed the FRA which directed agencies to consider “the reasonably foreseeable environmental effects of proposed agency actions” (42 U.S.C. 4332(2)(C)). Since the publication of the Draft EA, the CEQ revoked its regulations (40 CFR parts 1500-1508) implementing NEPA in response to EO 14154. This update was made to provide clarity that reasonably foreseeable direct and indirect impacts were evaluated in the EA.

Location of Revision in Draft EA Document	Revision	Reason for Revision
	Climate was replaced with GHG Emissions Appendix C Sections 3.3.1, 3.3.3, 3.3.3.2, 4.1, 4.3.3, 4.3.3.1, and 4.3.3.3. Section 3.3.3.1, Table 3-7 title Section 4.3, Table 4-2 Chapter 6, Table 6-1	After the publication of the draft EA, EO 13990, which was relied upon for the January 2023 CEQ draft GHG guidance, was revoked. In addition, CEQ revoked its regulations (40 CFR parts 1500-1508) implementing NEPA in response to EO 14154. As a result, all references to climate and the qualitative climate evaluation that discussed the level of preparedness with respect to the impacts of climate change, the extent to which the alternatives could be affected by future climate conditions, and if the alternatives are consistent with national, state, and local climate goals have been removed from the FEA.
	Removed environmental justice analysis and all references to environmental justice. This includes references to minority populations, percent below poverty levels, and EJSCREEN. Appendix K Sections 3.3.12, 3.3.12.2, 4.3.11, and 4.3.11.2 Section 3.3.12.1, Table 3-25 Section 3.3.12.1, Table 3-27 Section 3.3.12.3, Table 3-35 Section 4.3, Table 4-2	Since the publication of the draft EA, EOs 12898, 13985, 14091, and 14096 were revoked. On January 21, 2025, President Trump issued EO 14173. In addition, CEQ revoked its regulations (40 CFR parts 1500-1508) implementing NEPA in response to EO 14154. Consequently, it is no longer a legal requirement or the policy of the federal government to conduct environmental justice analyses. As a result, the prior discussion of, and data/analysis related to, environmental justice has been removed.

Location of Revision in Draft EA Document	Revision	Reason for Revision
	Removed cumulative impacts analysis and all references to cumulative impacts Section 1.1, Table 1-1 Chapter 5	CEQ regulations historically required the consideration of cumulative impacts. In 2023, Congress passed the FRA which directed agencies to consider "the reasonably foreseeable environmental effects of proposed agency actions" (42 U.S.C. 4332(2)(C)). Since the publication of the Draft EA, the CEQ revoked its regulations (40 CFR parts 1500-1508) implementing NEPA. In addition, the Supreme Court issued the Seven County Infrastructure Coalition v. Eagle County, 605 U. S. 975 (2025) (Seven County) ruling. As a result of these actions, it is no longer a legal requirement or the policy of the federal government to conduct cumulative impact analyses. In addition, the Seven County ruling reinforced the limited scope of NEPA reviews, holding that NEPA does not require an agency to consider environmental effects of other activities and projects "separate in time or place" from the proposed action. Therefore, this FEA has removed the prior discussion of, and data/analysis related to, cumulative impacts.
	Removed "GWP from USEPA, Emission Factors for Greenhouse Gas Inventories, Center for Corporate Climate Leadership, March 2018, https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf." Section 3.3.3, Table 3-8 Section 4.3.3, Table 4-14, Table 4-15, Table 4-16, Table 4-17	This information was incorporated into FAA's Aviation Emissions and Air Quality Handbook Version 3 Update 1 and the link to USEPA is no longer required.
Acronyms		
	Added Biological Opinion (BO).	New term added to the document.

Location of Revision in Draft EA Document	Revision	Reason for Revision
	Added Fiscal Responsibility Act (FRA).	New term added to the document.
Chapter 1		
Table 1-2	The description of L01 in Table 1-2 was updated to include: "The cell phone lot will be relocated to the main parking garage to accommodate the construction of L01."	Editorial update to address comment (012 WSDOT) received on the Draft EA.
Table 1-2	The description of NTP L03 has been updated to change the on-ramp from westbound to eastbound.	Text revised to address error identified by comment (012 WSDOT) received on the Draft EA.
Section 1.1	Footnote added regarding using FAA Order 1050.1F: FAA Order 1050.1G, FAA National Environmental Policy Act Implementing Procedures, was published on July 3, 2025. Projects that commence after July 3, 2025, are required to comply with FAA Order 1050.1G, while those projects already underway by that date may follow FAA Order 1050.1F. This EA relies upon FAA Order 1050.1F, the Fiscal Responsibility Act of 2023, EO 14173, *Ending Illegal Discrimination and Restoring Merit-Based Opportunity,* EO 14154, *Unleashing American Energy,* and the Supreme Court's decision in *Seven County Infrastructure Coalition v. Eagle County,* 605 U.S. (2025).	Footnote added to clarify use of FAA Order 1050.1F after the publication of FAA Order 1050.1G.
Chapter 2		
Section 2-6	Revised the description of Alternative 1-E as follows: "Construct a new concourse and gates (T01a) to the north of the Main Terminal connected to Concourse D and a new Second Terminal across the NAE (T02) to provide facilities necessary to accommodate 56 MAP at an optimal LOS."	Text revised to clarify the differences between Alternative 2 and Alternative 3.
Chapter 3		
Section 3.3.1.1, Table 3-2	Table 3-2 was revised as follows: The "Form of Measurement" column entry for $PM_{2.5}$ 1-year average was listed as "particulate matter" and was corrected to "Annual mean, averaged over 3 years." The third row for PM was listed as "(PM_{10})" and was corrected to "($PM_{2.5}$)" such that the primary and secondary 24-hour standard for $PM_{2.5}$ is 35 ug/m^3.	Text revised to address error identified by comment (010 EPA) received on the Draft EA.
Section 3.3.2.2	Text updated to include June 2025 for obtaining species lists.	Updated Biological Evaluation.

Location of Revision in Draft EA Document	Revision	Reason for Revision
Section 3.3.2.2, Table 3-5	Monarch Butterfly updated from Candidate to Proposed Threatened, including the Federal Register number and date. Suckley's Cuckoo Bumble Bee added to table. Footnotes updated to include information obtained in 2025.	Updated Biological Evaluation.
Section 3.3.10.2	The following text was added: "Off-airport refers to properties north of SR 518 (King County Water District #125), south of 188th Street (Highline Water District #75), and the far west portion of the airport (King County Water District #49)."	Editorial update for clarity.
Section 3.3.11.2	The number of schools that were sound insulated, within the Existing (2022) Condition 65+ DNL noise contour, was revised from two to five and there is one additional school that is in the process of being sound insulated.	Textual error identified between Draft and Final EA.
Section 3.3.11.2, Table 3-22	Added (Closed) to Southern Heights Elementary School.	Textual error identified between Draft and Final EA.
Section 3.3.15.2	The following project was added to the list of NTPs near a floodplain: "westside maintenance campus (S07)"	Textual error identified between Draft and Final EA.
Section 3.3.15.2	The following text was added: "PFAS has been detected in the Tyee Well at levels exceeding the State Action Level, therefore, this well was removed from service."	To address comment (016 WA Department of Health) received on the Draft EA.
Chapter 4		
Section 4.3, Table 4-2	Table 4-2 has been updated to include the following text regarding Water Resources: Would not result in an exceedance of water quality standards, contamination of public drinking water supplies, exceedance of groundwater quality standards, or contamination of an aquifer used for public water supply. "No impacts to floodplains are anticipated."	To address comment (016 WA Department of Health) received on the Draft EA.
Section 4.3.2.2, Table 4-11	Effects Determination of the Monarch butterfly was updated to "No effect" and Suckley's Cuckoo Bumble Bee was added with a "No effect" determination to reflect the latest version of the Biological Evaluation. Note was added to the table regarding NMFS and USFWS conclusions.	Updated Biological Evaluation and consultation completed.

Location of Revision in Draft EA Document	Revision	Reason for Revision
Section 4.3.2.2	Text was added to document consultation that occurred between the FAA and NMFS and the FAA and USFWS between the Draft and Final EA.	Consultation completed.
Section 4.3.10, Table 4-31	The 2032 No Action "Departures Night" column value was revised from "92.21" to "96.21".	Textual error identified between Draft and Final EA.
Section 4.3.10.2	The number of schools that were sound insulated, within the Future (2032) No Action, Alternative 2 and Alternative 3 65+ DNL noise contour, was revised from two to five and there is one additional school that is in the process of being sound insulated.	Textual error identified between Draft and Final EA.
Section 4.3.10.3	The number of schools that were sound insulated, within the Future (2037) No Action, Alternative 2 and Alternative 3 65+ DNL noise contour, was revised from two to five and there is one additional school that is in the process of being sound insulated.	Textual error identified between Draft and Final EA.
Section 4.3.10.4	Added the mitigation and minimization measures section to include minimization measures identified in the text.	Textual error identified between Draft and Final EA.
Section 4.3.11.1	Replaced text under minimization measures with "The Port will offer the approximately 25 Doug Fox Lot employees employment assistance."	Textual error identified between Draft and Final EA.
Section 4.3.14.4	Language was replaced with: "The Action Alternatives would not directly impact any floodplains or adversely affect any beneficial floodplain values. Two of the NTPs, Employee Parking Structure (L07) and CRDC (S10), are near floodplains but would not extend into the adjacent 100- or 500-year floodplain areas. The S. 157th Place access road included as part of the Westside Maintenance Project (S07) includes replacing a culvert and paving within a 100- and 500-year floodplain. The culvert would be designed to maintain the conveyance and storage capacity of the existing floodplain. Therefore, the Proposed Action would not result in significant impacts to the floodplain because they would not result in (1) a considerable probability of loss of human life, (2) likely future damage associated with the encroachment that could be substantial in cost or extent, or (3) a notable adverse impact on the floodplain's natural and beneficial floodplain values."	EO 14030 was rescinded.

Location of Revision in Draft EA Document	Revision	Reason for Revision
Footnote 71	The referenced appendix was changed from Appendix G to Appendix F.	Textual error identified between Draft and Final EA.
Chapter 7		
Entire Chapter	The following references were removed: Department of Ecology State of Washington. (2022, December). *Washington State Greenhouse Gas Emissions Inventory: 1990-2019, Publication 22-02-054*. EPA. (2024, April). *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2022.* King County website: https://kingcounty.gov/en/legacy/services/environment/climate/our-changingclimate/impacts#:~:text=Heavy%20rain%20events%20are%20getting,are%20harmful%20to%20marine%20species. 40 Code of Federal Regulations [CFR] § 1508.1, April 20, 2022 Leigh Fisher. (2018, May). Technical Memorandum No. 7, Facilities Implementation and Financial Feasibility. Section 102(2)(c), April 20, 2022 was removed from reference: Public Law (P.L.) 91-190, 42 United States Code (U.S.C.) 4321 *et. seq*., National Environmental Policy Act, 1969.	Reflects changes made in the document due to changes in laws, regulations, and guidance between Draft and Final EA.
Appendix A		
Constrained Operating Growth Scenario, Section 1	The term environmental justice was removed and climate was updated to GHG emissions from point #3 under the description of the process for conducting the assessment.	See explanations above regarding Environmental Justice and GHG Emissions.
Constrained Operating Growth Scenario, Table 5	Proposed Action Constrained Scenario Passengers for 2037 updated to 64,093,412.	Textual error identified between Draft and Final EA.

Location of Revision in Draft EA Document	Revision	Reason for Revision
Appendix C		
Entire Appendix	Climate was replaced with Greenhouse Gas and qualitative analysis on climate was removed from the appendix.	See explanations above regarding GHG Emissions.
AQ Technical Report, Table 1	Revised as follows: • "Form of Measurement" column entry for $PM_{2.5}$ 1-year average was listed as "particulate matter" and was corrected to "Annual mean, averaged over 3 years" • The third row for PM was listed as "(PM_{10})" and was corrected to "($PM_{2.5}$)" such that the primary and secondary 24-hour standard for $PM_{2.5}$ is 35 ug/m'.	Text revised to address error identified by comment (010 EPA) received on the Draft EA.
Appendix D		
Biological Evaluation	September 2024 version of the BE was replaced with the June 2025 version. Additional Section 7 correspondence between FAA and NMFS and FAA and USFWS was added.	Updated Biological Evaluation and consultation completed.
Appendix G		
	Additional correspondence between FAA and DAHP regarding the Washington Memorial Park (Cemetery) was added.	Add clarification and documentation to the FAA effects determination.
Appendix J		
Exhibit B-1, Missed Approach Operations"	The appendix was updated to include a higher resolution version of the 44-page memo.	Update to address comment (037 Vashon Island Fair Skies) received on the Draft EA.
Noise Technical Report, Section 7.1.2	The number of schools that were sound insulated, within the Existing (2022) Condition 65+ DNL noise contour, was revised from two to five and there is one additional school that is in the process of being sound insulated.	Textual error identified between Draft and Final EA.
Noise Technical Report, Table 7-30	Updated to include commercial jets and cargo jets under daytime arrivals.	Textual error identified between Draft and Final EA.

Location of Revision in Draft EA Document	Revision	Reason for Revision
Construction Noise Technical Report	Title updated to Final from Draft.	Textual error identified between Draft and Final EA.
Appendix K		
Appendix Title	Appendix title updated to remove Environmental Justice	See explanation above regarding Environmental Justice.
Environmental Justic Protocol	This report was removed from the Appendix.	See explanation above regarding Environmental Justice.
Appendix M		
	FFRMS information was removed.	EO 14030 was rescinded.
	Additional aquifer reference materials were added to the appendix.	Update to address comment (016 WA Department of Health) received on the Draft EA.
Appendix O		
	Updated to include comments and responses received on the Draft EA.	Update as part of finalizing the EA.

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Acronyms

Acronym	Acronym Definition
AAA	Airport Activity Area
AC	Advisory Circular
ACEIT	Airport Construction Emissions Inventory Tool
ACHP	Advisory Council on Historic Preservation
ACR	Air Cargo Road
AEDT	Aviation Environmental Design Tool
AFFF	Aqueous Film-Forming Foam
AIP	Airport Improvement Program
ALP	Airport Layout Plan
AMF	Aviation Maintenance Facility
AOA	Airport Operations Area
APE	Area of Potential Effect
APU	Auxiliary Power Unit
ARFF	Aircraft Rescue and Firefighting
BO	Biological Opinion
BE	Biological Evaluation
BGPA	Bald and Golden Eagle Protection Act
BMPs	Best Management Practices
BOD	Biochemical Oxygen Demand
BP	British Petroleum
BPA	Bonneville Power Administration
CAA	Clean Air Act
CATEX	Categorical Exclusion
CBRS	Coastal Barrier Resources System
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CH_4	Methane
CIP	Capital Improvement Plan
CNG	Compressed Natural Gas
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
CO	Carbon Monoxide
COGS	Constrained Operating Growth Scenarios
CRDC	Centralized Receiving and Distribution Center
CWA	Clean Water Act
CZM	Coastal Zone Management
CZMA	Coastal Zone Management Act
CZMP	Coastal Zone Management Program
DAHP	Department of Archaeology and Historic Preservation
dB	Decibel

Acronym	Acronym Definition
DNL	Day-Night Noise Level
DNS	Determination of Nonsignificance
DOE	Department of Energy
DOI	Department of the Interior
DOJ	Department of Justice
EB	Eastbound
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EO	Executive Orders
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FFRMS	Federal Flood Risk Management Standard
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Maps
FONSI / ROD	Finding of No Significant Impact / Record of Decision
FR	Federal Register
FRA	Fiscal Responsibility Act
GHG	Greenhouse Gas
GSA	General Study Area
GSE	Ground Support equipment
GT	Ground Transportation
GTC	Ground Transportation Center
GWMA	Groundwater Management Area
GWP	Global Warming Potential
H_2O	Water Vapor
HCS	Highway Capacity Software
HFC	Hydrofluorocarbons
HOV	High Occupancy Vehicle
IATA	International Air Transport Association
ILA	Interlocal Agreement
IPCC	Intergovernmental Panel on Climate Change
IWD	Industrial Waste Department
IWS	Industrial Wastewater system
IWTP	Industrial Wastewater Treatment Plant
LOS	Level of Service
LWCF	Land and Water Conservation Fund
LTV	Long-Term Vision
MAP	Million Annual Passengers
MBTA	Migratory Bird Treaty Act
MHI	Median Household Income

Acronym	Acronym Definition
MOU	Memorandum of Understanding
MOS	Modification of Standards
MOVES	Motor Vehicle Emissions Simulator
MSW	Municipal Solid Wastes
MT	Metric Tons
MTCA	Model Toxics Control Act
MW	Megawatt
NAAQS	National Ambient Air Quality Standards
NAE	North Airport Expressway
NAP	Natural Area Preserves
NAVAIDS	Navigational and Visual Aids
NEPA	National Environmental Policy Act
NEPL	North Employee Parking Lot
NERA	Northeast Redevelopment Area
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanographic and Atmospheric Administration
N_{2O}	Nitrous Oxide
NO_2	Nitrogen Dioxide
NO_x	Oxides of Nitrogen
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NPS	National Parks Service
NRCA	Natural Resource Conservation Areas
NRHP	National Register of Historic Places
NTPs	Near-Term Projects
O_3	Ozone
PAPI	Precision Approach Path Indicator
Pb	Lead
PCI	Pavement Condition Index
PFAS	Per- and polyfluoroalkyl substances
PFC	Passenger Facility Charge
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctanesulfonic Acid
P.L.	Public Law
$PM_{2.5}$	Fine Particulate Matter Less than or Equal to 2.5 Microns Aerodynamic Diameter
PM_{10}	Particulate Matter Less than or Equal to Ten Microns Aerodynamic Diameter
PMP	Pavement Management Program
Port	Port of Seattle
PSCAA	Puget Sound Clean Air Agency
PSE	Puget Sound Energy
PSRC	Puget Sound Regional Council

Acronym	Acronym Definition
PUD	Planned Unit Development
RCRA	Resource Conservation and Recovery Act
RIM	Runway Incursion Mitigation
RNG	Renewable Natural Gas
RON	Remain Over Night
SAF	Sustainable Aviation Fuel
SAMP	Sustainable Airport Master Plan
SCE	South Concourse Evolution
SCL	Seattle City Light
SDS	Stormwater Drainage System
SEA	Seattle-Tacoma International Airport
SEPA	State Environmental Policy Act
SF_6	Sulfur Hexafluoride
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SPU	Seattle Public Utilities
SR	State Route
STSA	Surface Transportation Study Area
SWMP	Stormwater Management Program
SRKW	Southern Resident Killer Whale
SWPPP	Stormwater Pollution Prevention Plan
THPO	Tribal Historic Preservation Officer
TIP	Transportation Improvement Program
TRACON	Terminal Radar Approach Control Facility
TRB	Transportation Research Board
U.S.C.	United States Code
UMP	Utility Master Plan
USACE	U.S. Army Corp of Engineers
USEPA	U.S. Environmental Protection Agency
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service
VCP	Voluntary Cleanup Program
VOC	Volatile Organic Compounds
WA	Washington State
WB	Westbound
WHPA	Wellhead Protection Areas
WSDE	Washington State Department of Ecology
WSDOT	Washington State Department of Transportation

1 Introduction and Purpose & Need

1.1 Introduction

This Environmental Assessment (EA) for the Seattle-Tacoma International Airport (SEA) Sustainable Airport Master Plan (SAMP) Near-Term Projects (NTPs) is being prepared in accordance with the requirements set forth by the National Environmental Policy Act (NEPA), as amended (42 USC § 4331 et seq.), and Federal Aviation Administration (FAA) Orders 1050.1F, *Environmental Impacts: Policies and Procedures*, and 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*.[1] The purpose of this EA is to determine if the development and operation of the Proposed Action has the potential to significantly affect the human environment. Environmental review and approval are required under NEPA because the Proposed Action would require multiple federal actions (see Section 1.4, Requested Federal Actions). **Table 1-1** provides an outline and description of the chapters included in this EA.

The FAA invited the U.S. Army Corps of Engineers (USACE) to participate as a cooperating agency as described under 42 USC § 4336a(a)(3) and USACE accepted.

TABLE 1-1: OUTLINE OF THE EA

Chapter	Description
Chapter 1, Purpose and Need	Describes the background for the project, as well as the purpose and needs for the project
Chapter 2, Alternatives	Describes the process for identifying and evaluating alternatives for further consideration in the environmental review process
Chapter 3, Affected Environment	Describes the baseline conditions for each of the environmental resource categories
Chapter 4, Environmental Consequences	Describes the potential reasonably foreseeable environmental effects, the significance of those effects, and proposed mitigation (where necessary), of the different alternatives for each environmental resource category
Appendices	Provides more detail on individual topics and outreach conducted

1.2 Background

1.2.1 Planning Process

The SAMP[2] identified a Long-Term Vision to accommodate future passenger levels and address identified needs for SEA over the 20-year planning horizon (through 2034). One of the overarching needs from the SAMP was to improve the experience for passengers at SEA. The current passenger processing functions, such as on-site parking, check-in hall, security screening, holdrooms, and the number of gates, were limited or undersized for the number of passengers SEA served in 2018 and

[1] FAA Order 1050.1G, FAA National Environmental Policy Act Implementing Procedures, was published on July 3, 2025. Projects that commence after July 3, 2025, are required to comply with FAA Order 1050.1G, while those projects already underway by that date may follow FAA Order 1050.1F. This EA relies upon FAA Order 1050.1F, the Fiscal Responsibility Act of 2023, Executive Order (EO) 14173, *Ending Illegal Discrimination and Restoring Merit-Based Opportunity,* EO 14154, *Unleashing American Energy,* and the Supreme Court's decision in *Seven County Infrastructure Coalition v. Eagle County,* 605 U.S. _ (2025).

[2] The SAMP was prepared over a three-year period (2015 to 2018).

continue to be undersized. The results of these limitations are crowded spaces, long lines, and delayed flights. These problems are expected to worsen as passenger demand increases.

The SAMP ultimately concluded that even with the implementation of the full Long-term Vision, unconstrained 20-year demand would result in airfield congestion and high levels of delay. This congestion and delay would occur primarily as a result of limitations in the airfield / airspace system. The Port of Seattle (Port) and FAA determined that addressing these long-term airfield / airspace limitations is outside of the scope of SAMP and that a more comprehensive airfield and airspace planning study is needed to understand if additional actions would be required before the Long-term Vision could be fully implemented. Because additional planning is needed, the FAA determined that the Long-term Vision was not yet ripe for environmental review.

The Port developed the NTPs, which is a plan to address the near-term needs, whether the Port pursues the long-term projects or addresses the long-term airfield / airspace limitations. The NTPs are the subject of this environmental review and include 31 projects that would improve the efficiency and safety of SEA, access to SEA, and support facilities for the airlines and SEA. Because the NTPs focus on a more immediate timeframe and address needs that are distinct from what may come from future planning, the NTPs are independent from the Long-term Vision. The FAA determined that the NTPs are ripe for environmental review.

The sustainability component of the SAMP focused on the Port's long-standing history of implementing sustainability initiatives to achieve its environmental goals and objectives. Through the SAMP process, the Port focused on what facilities are needed, where these facilities would be located, and how these facilities would be operated from a sustainability perspective.[3]

1.2.2 EA Timeline

The FAA and Port initiated the EA for the SAMP NTPs on July 30, 2018 with a 60-day public and agency scoping period. The scoping period closed on September 28, 2018 and the FAA and Port reviewed comments received from the public and agencies. Based on scoping comments, the FAA and Port made the decision to complete the NEPA and State Environmental Policy Act (SEPA) analysis separately and sequentially. In March of 2020, the COVID public health emergency resulted in dramatic reductions in passengers and aircraft operations and resulted in a partial deferral of spending by the Port. Due to the reduction in activity between 2020 and 2022 and the partial deferral of spending, the Port reevaluated the opening year for the NTPs. Based on the projections of activity in the 2023 Updated Forecast and the time it would take to construct the NTPs, the Port determined the opening year for the NTPs would be 2032. Updated impact analyses were prepared in 2023 through 2024 based on the revised timeframe.

At the end of this environmental review process, the FAA will either issue a Finding of No Significant Impact / Record of Decision (FONSI / ROD) or determine that the Proposed Action has the potential for one or more significant impacts to the human environment, thereby requiring the preparation of an Environmental Impact Statement (EIS).

[3] The SAMP Technical Memorandum No. 9 Sustainability Planning and Management Strategy provides the specific ways the Port would incorporate sustainability into the development process and can be found here: https://www.airportprojects.net/sampenvironmentalreview/tm-no-9-sustainability-plan-management/.

1.3 Proposed Action

In this EA, the NTPs are collectively referred to as the Proposed Action, which are described in **Table 1-2** and shown on **Exhibit 1-1**. Based on the current schedule for environmental review, construction could begin late 2025. If the Port decides to proceed with the project following the environmental reviews, the Proposed Action could be substantially complete and operational by 2032.

Section 163 of the FAA Reauthorization Act of 2018, H. R. 302, (Public Law (P.L.) 115-254) and Section 743 of the FAA Reauthorization Act of 2024, H.R. 3935 (P.L. 118-63) limited FAA's approval authority to portions of Airport Layout Plans (ALPs) that meet certain statutorily defined criteria and prohibited the FAA from directly or indirectly regulating airport land use unless certain exceptions exist. While the Proposed Action details the Port's intended development at SEA, only some of these development components now are subject to federal approval and / or funding. However, the entire Proposed Action is analyzed in this EA.

The airfield projects (A01-A10) would require the FAA to relocate FAA-owned equipment (including navigational and visual aids (NAVAIDs)) and associated infrastructure. These relocations would also require modifications to existing procedures. The extent of these relocations and modifications are not known at this time and would be determined during the design of the Proposed Action. The analysis in this EA includes details that are currently known.

TABLE 1-2: PROPOSED ACTION PROJECTS

Project Element	Description
Airfield Projects	**Airfield Projects Description**
A01 – Taxiway A/B Extension	Extension of parallel Taxiways A and B by approximately 1,800 feet to provide access to the south end of Runway 16L/34R. Includes: • Construction of parallel taxiway connectors from Taxiway B to Runway 16L/34R. • Relocation of Taxiway S 310 feet south. • Relocation of the Runway 34R glideslope antenna and shelter to the southeast. • Adjustment of the Runway 34R glideslope angle and precision approach path indicator (PAPI) to match the glideslope. • Amendments to flight procedures to accommodate change in glideslope angle. • Relocation of a vehicle service road bridge over S. 188th Street Taxiways would have in-pavement centerline lights, elevated taxiway edge lights, hold position markings with in-pavement lights, elevated runway guard lights, and signage.
A02 – Runway 16R/34L Blast Pads	Expansion of Runway 16R/34L blast pads from 200 feet by 200 feet to 220 feet by 400 feet to meet current FAA standards and relocation of NAVAIDs.
A03 – Taxiway C/D Reconfiguration and Runway Incursion Mitigation (RIM)	Modification of existing taxiway geometry of Taxiways C and D to correct non-standard intersection angles and reconfigure non-standard intersections. Includes the extension of Taxiways C and D by approximately 500 feet to intersect with Taxilane A and removal of pavement north of Taxiway C to mitigate the existing RIM location.
A04 - Taxiway B 500-foot Separation	Relocation of Taxiways A and B 100 feet east between Taxiways C and L to provide the required 500 feet runway/taxiway separation. Includes extending Taxiways C, D, E, H, and K to the relocated Taxiway B and relocating NAVAIDs. Taxiways would have in-pavement centerline lights, elevated taxiway edge lights, hold position markings with in-pavement lights, elevated runway guard lights, and signage.
A05 – North Hold Pad	Construction of a new approximately 90,000 square foot hold pad for four aircraft to reduce congestion on the taxiways and at the terminal.

TABLE 1-2: PROPOSED ACTION PROJECTS (CONTINUED)

Project Element	Description
Airfield Projects	**Airfield Projects Description**
A06 – Runway 34L High-Speed Exit	Construction of a new high-speed exit for Runway 34L arrivals between Taxiways J and E to allow for more efficient use of the runway by arriving aircraft. The high-speed exit would be equipped with in-pavement centerline lights, elevated taxiway edge lights, hold position markings with in-pavement lights, and taxiway signage. Includes the relocation of the multilateration remote unit.
A07 – Taxiway D Extension	Extension of Taxiway D by approximately 500 feet from Runway 16C/34C west to Taxiway T. Includes in-pavement centerline lights, elevated taxiway edge lights, hold position marking with in-pavement lights, elevated runway guard lights, and signage.
A08 – North Cargo Hardstand	Construction of a new approximately 360,000 square foot (1,200 feet by 300 feet) cargo aircraft hardstand in the North Cargo area east of Taxiway A. The hardstand would accommodate five aircraft for loading and unloading cargo freight and parking cargo aircraft. Construction would require the relocation of the existing United maintenance hangar and Swissport cargo facility (S08), relocation of the Port's aviation maintenance facility (S07), and relocation of ground service equipment maintenance (S09).
A09 – Central Hardstand	Construction of a new approximately 292,000 square foot hardstand for seven aircraft north of Concourse D and east of the North Satellite to accommodate increased demand for passenger hardstand operations and overnight parking of passenger aircraft. Buses would bring passengers to / from aircraft on the hardstand. Construction of A09 requires relocating portions of the North Airport Expressway (NAE) (L01).
A10 – Taxiway Fillets	Construction of new full strength pavement panels and shoulders and the installation of edge lighting and signage to bring taxiway fillets up to current FAA standards.
Terminal Projects	**Terminal Projects Description**
T01 – North Gates	Construction of a new multi-level terminal concourse and aircraft apron to accommodate up to 19 gates. The new terminal concourse would have a footprint of approximately 203,000 square feet and contain three levels (approximately 609,000 square feet total). The new terminal concourse would include: • Ramp level for baggage handling and aircraft support functions. • Concourse level with passenger holdrooms, concessions, restrooms, and other passenger and airline support functions. • Mezzanine level with office space. • Above-ground elevated pedestrian walkway to the passenger terminal. The new facility would be located north of the North Satellite Concourse and would displace the Aircraft Rescue and Firefighting (ARFF) station (S02), Cargo 6 warehouse (C01), deicing tanks (S06), NAE (L01) and fuel rack (S04).
T02 – Second Terminal and Parking	Construction of a new multi-level passenger terminal across the NAE from the proposed terminal concourse (T01). The new terminal would be approximately 575,000 square feet in size, with a footprint of approximately 166,000 square feet. The new terminal would include: • Basement level for baggage handling and screening. • Baggage claim level for arriving passengers. • Interstitial (or open) level connected to a new garage that provides commercial curbside space. • Departures level with passenger check-in and security screening facilities. Includes a new multi-level parking garage to provide approximately 1,350 parking spaces. The new facilities would displace the Doug Fox Parking Lot.

TABLE 1-2: PROPOSED ACTION PROJECTS (CONTINUED)

Project Element	Description
Cargo Projects	**Cargo Projects Description**
C01 – Cargo 4 South Redevelopment	Construction of an approximately 80,000 square foot building (warehouse and office space, truck terminals, and parking) on the Cargo 4 South site located in the existing central cargo area of the Airport to replace Cargo 6 warehouse demolished for T01.
C02 – Offsite Cargo Phase 1	Construction of a new approximately 330,000 square foot cargo warehouse building (warehouse and office space, truck terminals, and parking) on the Port's L-shaped parcel located north of State Route (SR) 518.
C03 – Offsite Cargo Phase 2	Construction of a new approximately 90,000 square foot cargo warehouse building (warehouse and office space, truck terminals, and parking) on the Port's L-shaped parcel located north of SR 518.
Landside Projects	**Landside Projects Description**
L01 – North Airport Expressway (NAE) Relocation (southbound lanes)	Construction of approximately 7,300-linear-feet of new NAE to access the Second Terminal and alleviate congestion on existing roadways. The new roadway would replace a section of the existing roadways eliminated for the construction of A09 and T01. The relocated portion of the NAE would also be widened from three lanes to four lanes. The cell phone lot will be relocated to the main parking garage to accommodate the construction of L01.
L02 – Elevated Busway and Stations	Construction of approximately 6,000-linear-feet of elevated busway and three stations to connect the Main Terminal, new Second Terminal, and Rental Car Facility. The busway and stations would be located along the eastern edge of Airport property and would tie into existing bus routes. Displaces existing GT holding lot (L05).
L03 – Second Terminal Roads and Curbside	Construction of a loop ramp from the southbound lanes of the NAE to provide access to the new passenger terminal. The ramp would connect to the existing S. 160th Street Loop, eastbound SR 518 on-ramp at S. 160th Street, or the existing northbound lanes of the NAE. Includes construction of split-level curbsides for arriving vehicles, departing vehicles, and commercial vehicles (shuttles, taxis, and ride-share companies).
L04 – Northeast Ground Transportation Center (NE GTC)	Construction of a NE GTC on the north side of the existing parking garage. The NE GTC facility would be approximately 255,000 square feet and would include: • Expansion of the existing charter and cruise bus lot on the ground floor level. • Shuttle bus platform on level two serving as the southern terminus of the elevated busway (approximately 87,000 square feet). • Passenger circulation and check-in facilities on level three providing terminal-quality space for passengers arriving / departing on the elevated busway and Link Light Rail at the Airport Station to transition to / from the Main Terminal (approximately 64,000 square feet). • Office space on levels four and five (approximately 52,000 square feet per level).
L05 – North Ground Transportation (GT) Holding Lot	Relocation of the GT holding lot on Port property north of SR 518 and south of S. 144th Street to replace the parking lot displaced by L02. This lot would be used for ground transportation holding, as drivers await trip requests or passenger arrival.
L07 – Employee Parking Structure	Construction of a new eight-story (i.e., one below grade and seven above-grade) parking structure that would provide approximately 3,500 parking stalls on Port property north of SR 518 and south of S. 144th Street to accommodate employee parking demand. The structure would have a footprint of approximately 3.3 acres.

TABLE 1-2: PROPOSED ACTION PROJECTS (CONTINUED)

Project Element	Description
Airport / Airline Support Projects	**Airport / Airline Support Projects Description**
S01 – Fuel Farm Expansion	Expansion of the existing fuel farm onto the former south employee parking lot. This would include: • Four new settling tanks, adding approximately 10-million-gallons storage capacity. • Blending tank (approximately 500,000-gallon) and approximately 100,000-gallon Sustainable Aviation Fuels (SAF) receipt tank. • Additional piping. • Expanded spill containment dike. • New truck fuel rack to support the delivery of SAF for blending.
S02 – Primary ARFF Facility	Relocation of the Primary ARFF station for construction of T01. The new ARFF would be approximately 50,000 square feet and would be located on the south airfield between Runway 16R/34L and Runway 16C/34C.
S03 – Secondary ARFF Facility	Construction of an approximately 10,000 square foot Secondary ARFF to provide ambulatory response to the terminals and concourses, fuel spill and fire response to the concourse ramp areas, and backup emergency response to the airfield. The Secondary ARFF facility would be integrated within the new Concourse (T01) at the southeast end of the concourse and would have both airside and landside access.
S04 – Fuel Rack Relocation	Relocation of the fuel rack from the Cargo 6 area to the Cargo 3 area for construction of T01. The fuel rack is where fuel trucks refill.
S05 – Triculator	Relocation of the triculator building from east of the existing ARFF station to the North Cargo area to clear the site for A09. The triculator transfers aircraft waste to the sewer system.
S06 –Deicing Tanks	Relocation of deicing fluid tanks currently located at Cargo 6 and Cargo 7 to a northern and southern locations to clear the site for the new concourse. Each site would have a containment system and two tanks, one for Type I deicing fluid (for shorter-term protection) and the second for Type IV deicing fluid (for longer-term protection). Each set of tanks would also have a blending station.
S07 – Westside Maintenance Campus	Relocation of the Port's aviation maintenance facility (AMF) for construction of A08 to vacant land on the west side of the Airport in the Westside Maintenance Campus, co-locating it with other related functions. The AMF facilities would include a vehicle fuel rack, airfield deicer storage, snow equipment storage, multi-bay buildings and associated maintenance facilities. The existing S. 168th Street access would be reconstructed and a new access road would be constructed from S. 157th Place to the new facility.
S08 – North Airline Support	Construction of an approximately 15,000 square foot airline support building in the northeast corner of the North Cargo area to accommodate airline support functions displaced by construction of T01 and A08.
S09 – West Airline Support	An approximately 25,700 square foot expansion to the west of the existing AMB / AFCO III building used for cargo operations. The expanded building would accommodate displaced maintenance functions for construction of T01 and A08.
S10 – Centralized Receiving and Distribution Center (CRDC)	Construction of a new approximately 55,000 square foot CRDC on Port property north of SR 518 and south of S. 144th Street to improve security and efficiency in moving supplies to SEA dining and retail concessionaires in the passenger terminals. The new CRDC would include a warehouse, office space, truck terminals, and parking for visitors and employees.

TABLE 1-2: PROPOSED ACTION PROJECTS (CONTINUED)

Project Element	Description
Buildings to be Relocated	**Project Requiring Relocation**
Fuel Rack	T01 – North Gates
Portion of NAE	L01 – NAE Relocation (southbound lanes)
Triculator	T01 – North Gates
Buildings to be Demolished	**Project Requiring Demolition**
Primary ARFF Facility	T01 – North Gates
Swissport Cargo Facility (T01)	T01 – North Gates
United Airlines Maintenance / Cargo 4S	C01 – Cargo 4 South Redevelopment
Gate Gourmet Flight Kitchen	T02 – Second Terminal and Parking
Deicing fluid tanks	S06 – Deicing Tanks
Port Maintenance Building	A08 – North Cargo Hardstand
United Airlines Aircraft Maintenance Facility	A08 – North Cargo Hardstand
PACCAR	S02 – Primary ARFF
Doug Fox Payment Building & Office	T02 – Second Terminal and Parking
Guard Shack	A09 – Central Hardstand
Port Westside Field Offices	S07 – Westside Maintenance Campus
Overall Program Support Projects	**Overall Program Support Projects Descriptions**
Stormwater / industrial wastewater infrastructure	Expansion of existing stormwater / industrial wastewater infrastructure.
Stormwater management facilities	Construction of new stormwater management facilities.
Storm drainage vaults	Conversion of two existing storm drainage vaults (3 and 3A) to industrial wastewater system vaults.
Utilities	Utility connections (sewer, water, natural gas, fuel, and information / communication technology).
Central mechanical plant	Central mechanical plant upgrades.
Construction staging	Construction staging on Port property outside of sensitive areas.

Note: As a result of comments received during scoping, the Port integrated Project L06 (a proposed surface lot for employee parking) into Project L07. Therefore, L06 is not being carried forward.

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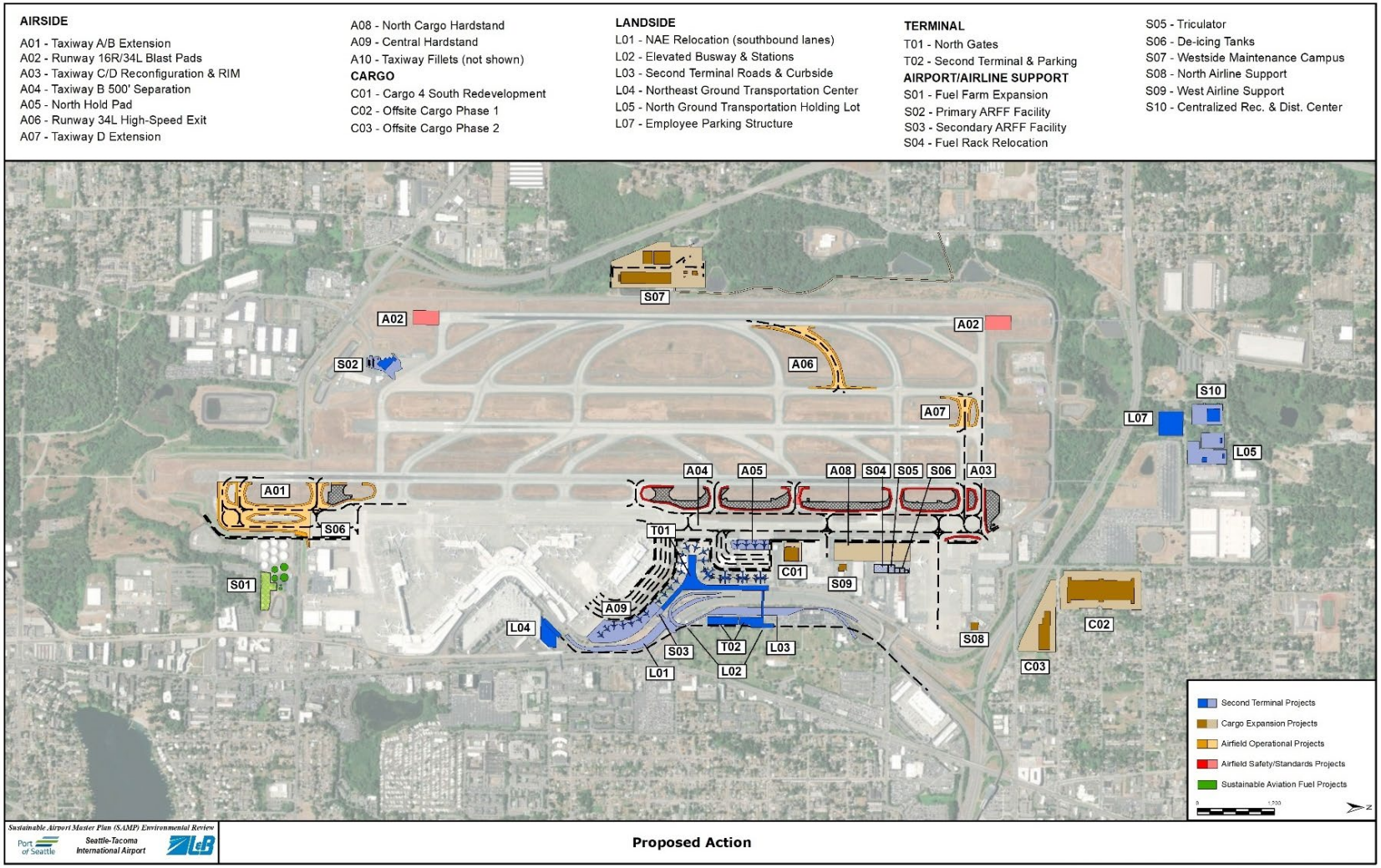
EXHIBIT 1-1: PROPOSED ACTION



Note: NAE = North Airport Expressway; GT = ground transportation; ARFF = aircraft rescue and firefighting

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1.4 Requested Federal Aviation Administration Actions

The following are the actions or approvals the FAA must make before the Port can implement the Proposed Action, described in Section 1.3.

- Unconditional approval of the ALP to depict those portions of the Proposed Action subject to FAA review and approval pursuant to 49 U.S.C. § 47107(a)(16)(B).
- Approval and construction, installation, and relocation of FAA-owned equipment (including NAVAIDs) and associated infrastructure as well as any resulting flight procedures updates from the relocation of navigational aids.
- Release of federal obligations to use property for non-aeronautical purposes, including any obligations under 49 U.S.C. § 47107, in accordance with FAA Order 5190.6B.
- Approval of changes to the airport certification manual pursuant to 14 CFR Part 139.
- Determination of project eligibility for Airport Improvement Program (AIP) funding in accordance with 49 U.S.C. §§ 47101-47144.
- Determination of project eligibility to impose Passenger Facility Charges in accordance with 49 U.S.C. § 40117.

1.5 Aviation Activity

Forecasts of aviation activity are projections of aircraft operations and passengers for future conditions. They are useful for determining future facility needs, as well as for determining future environmental impacts. The forecasts prepared as part of the SAMP were completed in 2015 and projected activity through 2034. At the end of the scoping process, the Port initiated and prepared an updated aviation activity forecast in 2019. This forecast was approved by the FAA in January 2020. In March of 2020, the COVID public health emergency resulted in dramatic reductions in passengers and aircraft operations. Due to the reduction in activity between 2020 and 2022, the Port reevaluated the projected passenger and aircraft operations demand for SEA, as well as the opening year for the NTPs. Ultimately in 2022, the Port in collaboration with the FAA, decided to prepare an updated aviation activity forecast (2023 Updated Forecast) to capture the impact of the COVID-19 public health emergency on future passenger and aircraft operations at SEA. The forecast was approved by the FAA in April 2024. (**Appendix A, Forecast and Airport Operational Assumptions)**.

Because demand would be constrained with or without the NTPs, the Port also prepared Constrained Operating Growth Scenarios (COGS) using the 2019 forecast as the base forecast that was then modified to reflect the relevant constraints and updated the COGS using the 2023 Updated Forecast. These COGS represent the best projection of how growth would occur over time with and without the NTPs. Therefore, the passenger and aircraft operations from the COGS were used for this EA. The FAA approved the updated COGS (provided in **Appendix A**) for use in this NEPA EA.

Implementation of the NTPs would neither induce regional macro-economic growth nor induce demand for air services to higher levels than expected in the unconstrained forecast. However, the NTPs would increase SEA's ability to accommodate increased aircraft operations and passenger activity at an acceptable level of delay, by adding aircraft gates and passenger processing facilities. As a result, it is assumed that after implementation, the number of aircraft operations and passengers would increase toward the projected unconstrained levels in the 2023 Updated Forecast. This higher growth rate, which is effectively induced demand, is expected to occur for approximately 24 months as airlines adjust their schedules to the additional gate availability. However, it is not anticipated that SEA would be able to accommodate the projected unconstrained aircraft operations and passengers from the 2023 Updated

Forecast, even with the implementation of the NTPs. Therefore, it is assumed that SEA would again experience constrained growth rates after buildout of the NTPs, as airfield and airspace capacity then become the primary constraining factors.

1.6 Purpose & Need

The purpose and need is essential in establishing a basis for the development of reasonable alternatives. **Appendix B, Purpose & Need and Alternatives Supporting Information** provides additional information on the needs.

1.6.1 Purpose and Need Statement

The purpose and need for the Proposed Action is to accommodate 56 MAP (million annual passengers) at an optimal level of service and projected cargo levels; provide airfield infrastructure that meets current FAA airport design standards; enhance the efficiency of the overall taxiway layout; and meet projected fuel storage demand including SAF initiatives. While the NTPs were designed to accommodate 56 MAP at an optimal level of service (LOS) [4], the COGS shows a higher passenger demand. The Port acknowledges passenger levels above 56 MAP would be served at a lower LOS.

1.6.2 Needs

The Proposed Action addresses five independent needs that affect the future ability of SEA to maintain its essential function as the primary commercial Airport in the Pacific Northwest (see **Table 1-3**). The five needs are:

1. Insufficient passenger processing facilities and gates to accommodate 56 MAP at an optimal LOS.
2. Insufficient facilities to accommodate projected cargo levels.
3. Portions of the airfield no longer meet current FAA airport design standards.
4. Inefficient / inadequate taxiway layout.
5. Lack of fuel storage to meet projected demand and the Port's SAF initiative.

TABLE 1-3: NEEDS, DEFICIENCIES, AND RESOLUTIONS

Need	Problem	Resolution Needed
Insufficient passenger processing facilities and gates to accommodate 56 MAP at an optimal LOS	Passenger check-in areas do not provide the necessary check-in kiosks nor sufficient space for proper circulation around the kiosks.	Need an additional 54 check-in positions and 28,500 square feet of space (total of 66,200 square feet) to accommodate 56 MAP at an optimal LOS.
Insufficient passenger processing facilities and gates to accommodate 56 MAP at an optimal LOS	Insufficient security screening areas to handle peak passenger volumes in 2022.	Need an additional six screening lanes and 35,100 square feet of space (total of 80,500 square feet) to accommodate 56 MAP at an optimal LOS.

[4] 56 MAP was identified as a benchmark for what the Airport could serve at an optimal level of service within existing airspace, airfield, and cost constraints. See explanation of "optimal (optimum) level of service" in Advanced Planning Terminal Needs Assessment located in Appendix B.

TABLE 1-3: NEEDS, DEFICIENCIES, AND RESOLUTIONS (CONTINUED)

Needs	Problem	Resolution Needed
Insufficient passenger processing facilities and gates to accommodate 56 MAP at an optimal LOS	Terminal ramp is limited and constrained by adjacent facilities, taxilanes, and taxiways. Additionally, adjacent aircraft parking positions can be affected by the type and size of aircraft being parked at a gate. The terminal ramp can accommodate 88 aircraft.	• Need 19 additional aircraft parking positions for 56 MAP. • Need 56,000-69,000 square feet of holdroom space and 43,000-86,000 square feet of circulation space for 19 narrowbody equivalent gates. • Need 35 remote parking positions to accommodate remain overnight (RON) aircraft at 56 MAP.
Insufficient passenger processing facilities and gates to accommodate 56 MAP at an optimal LOS	Existing parking constraints for employees and passengers.	• Need 12,440 public parking stalls to accommodate 56 MAP. • Need at least an additional 1,380 employee parking spaces to accommodate future employee parking demand (180 additional terminal garage parking and 1,200 additional remote parking spaces).
Insufficient passenger processing facilities and gates to accommodate 56 MAP at an optimal LOS	Arrival and departure curbfronts both experience an overall LOS of F during the peak hour.[5]	Need at least an additional 100-linear feet of departure curb, 620-linear feet of arrival curb, and one additional lane on the arrival curb to maintain LOS C to accommodate 56 MAP.
Insufficient facilities to accommodate projected cargo levels	Cargo facilities are approaching capacity limits.[6]	Need up to four additional parking positions[7] and an additional 296,100 square feet of cargo warehousing to accommodate the 2032 level of cargo demand.[8]
Portions of the airfield no longer meet current FAA airport design standards	Blast pads on the ends of Runway 16R/34L are 200 feet by 200 feet.	Need standard blast pads for Runway 16R/34L, which is 220 feet by 400 feet.[9]
Portions of the airfield no longer meet current FAA airport design standards	Intersection of Taxiway A with Taxiways C and D near the Runway 16L threshold.	Need to meet design standards for taxiway intersections by limiting a pilot to no more than three choices.

[5] Port of Seattle, Landside Level of Service Analysis, Arrival and Departure Curbside and Roadway LOS (2019).
[6] As demonstrated by the warehouse utilization and facility requirements calculated in the Air Cargo Growth Potential and Facility Requirements Assessment – Final Report.
[7] As reported in Appendix A – Aviation Activity Forecast Update, September 2023, Table 6, cargo aircraft operations are forecast to increase by approximately 24% from 2022 (14,851 operations) to 2032 (18,557 operations). A corresponding 24% increased need for cargo parking positions from 18 positions in 2022 results in a need for up to 22 positions in 2032.
[8] Cargo warehousing space requirements were calculated using Operating Concept #1 as described in SAMP Technical Memorandum No. 5, Facility Requirements, page 5-7. Available for review at: https://www.airportprojects.net/sampenvironmentalreview/tm-no-5-facility-requirements/.
[9] FAA AC 150/5300-13B, Airport Design, Appendix G, Table G-11. Runway Design Standards Matrix, C/D/E – V, 2022.

TABLE 1-3: NEEDS, DEFICIENCIES, AND RESOLUTIONS (CONTINUED)

Needs	Problem	Resolution Needed
Portions of the airfield no longer meet current FAA airport design standards	Taxiway B has 400 feet of separation from the Runway 16L/34R and operates under a FAA approved Modification of Standards (MOS). Based on the terms of this MOS, any future improvements along Taxiway B must be built to FAA standards.	Need to meet the required separation between the Runway 16L/34R centerline and Taxiway B centerline of 500 feet for any future improvements.[10]
Inefficient/inadequate taxiway layout	A single taxiway (Taxiway B) serves the south end of Runway 16L/34R, which results in a long line of aircraft queuing on Taxiway B during peak departure periods in north flow (departures on Runway 34R). This taxiway layout is inefficient and a contributor to airfield delays.	Need to improve taxiway layout to enhance airfield efficiency and reduce delay.
Inefficient/inadequate taxiway layout	During peak operating periods, the taxiways west of Runway 16C/34C become congested due to a lack of taxiways, holding areas, and taxiways crossing Runway 16C/34C, resulting in delays to taxiing aircraft.	Need to improve taxiway layout to enhance airfield efficiency and reduce delay.
Lack of fuel storage to meet projected demand and the Port's SAF initiative	SEA's fuel storage system has a capacity to hold approximately 17-million-gallons of Jet A fuel. Based on average day peak month operations, the fuel farm has approximately seven days of fuel reserves.[11]	• Need 22 to 31-million-gallons of fuel capacity to provide approximately 7 to 10 days of fuel reserve, respectively • Need to meet Port goal to power every flight fueled with at least 10 percent SAF.

1.6.3 Purposes

Based on the various deficiencies (needs) discussed previously, the purposes of the Proposed Action are to provide:

- Additional passenger processing facilities and gates to accommodate projected 56 MAP at an optimal LOS.
- Additional cargo facilities to accommodate projected cargo demand.
- Airfield infrastructure to meet current FAA airport design standards.
- Improvements to enhance the efficiency of the overall taxiway layout.
- Additional fuel storage facilities to meet projected demand and the Port's SAF initiative.

[10] FAA AC 150/5300-13B, Airport Design, Appendix G, Table G-12. Runway Design Standards Matrix, C/D/E – VI, 2022.
[11] SAMP Technical Memorandum No. 5, Facility Requirements, page 6-2. Available for review at: https://www.airportprojects.net/sampenvironmentalreview/tm-no-5-facility-requirements/.

2 Alternatives

2.1 Introduction / Background

This chapter describes the process used to identify and evaluate alternatives to the Proposed Action for the SEA NTPs. The identification and evaluation of alternatives during the environmental review process is considered to be the heart of the NEPA process, and it includes identifying reasonable and feasible alternatives that meet the Purpose and Need of the Proposed Action.

2.2 Regulatory Requirements

The review of alternatives for this EA was conducted in accordance with NEPA, FAA Order 1050.1F, and FAA Order 5050.4B, which require a thorough and objective assessment of the Proposed Action, the No Action Alternative, and reasonable and feasible alternatives that would achieve the stated Purpose and Need.

2.3 Alternative Evaluation Process

Alternatives were evaluated using a two-step screening process. The first level screening examined whether the alternative met the Purpose and Need. If the alternative satisfied the Purpose and Need, it moved to the second level. The second level screening evaluated which alternatives were reasonable and feasible based on a qualitative evaluation of factors related to operational impacts and cost. Alternatives that were determined to be reasonable and feasible were carried forward for detailed environmental impact analysis. An alternative is reasonable if it is technically and economically feasible and meets the Purpose and Need.

The alternatives considered in this EA were derived from the SAMP process, as well as public input during the scoping process. In accordance with NEPA, a No Action Alternative is included.

2.3.1 Alternatives Derived from the SAMP

The SAMP included an extensive evaluation of a full-range of alternatives for each of SEA's primary functional areas. As part of the EA process, the SAMP alternatives were reviewed to determine which ones should be brought forward into this EA. These alternatives are described in Section 2.5, Potential Action Alternatives.

2.3.2 Alternatives Suggested During Scoping Process

During the scoping process, several commenters suggested alternatives to be considered as part of the EA. After careful consideration and review, most of the suggestions received during scoping were not carried forward for further evaluation in the EA because they would not address the Purpose and Need and / or were found to not be reasonable or feasible. The alternatives received during scoping that were reviewed, evaluated, and eliminated from further consideration are listed in **Table 2-1**. More information on each of these scoping alternatives is provided in **Appendix B** and **Appendix N, Scoping**.

TABLE 2-1: EVALUATION OF ALTERNATIVES FROM THE SCOPING PROCESS

Scoping Suggestion	Does it meet Purpose and Need? (Level 1 Screening)	If Yes, Other Considerations (Level 2 Screening)
Phased Construction of Passenger Gates: Suggested phasing the construction of gates (9 or 10 gates to serve 56 MAP and additional gates in a second phase that would accommodate up to 110 operations per hour) and an extension of Concourse D in the first phase rather than a Second Terminal. A new concourse was included as part of the second phase.	NO Does not provide the required number of passenger gates and holdrooms to meet the need for serving 56 MAP at an optimal LOS. A connection to Concourse D is included in Alternatives 1-B and 1-E.	N/A
Terminal Processing Facilities: Suggested smaller expansion of terminal processing facilities.	NO Would result in sub-optimum LOS, inconsistent with Purpose and Need.	N/A
Roadway and Curbside Changes: Suggested greater reliance on mass transit, a set of roadway / curbside changes, and operational options, but with no preferred option provided.	NO Material provided did not demonstrate that any of the submitted options could meet Purpose and Need.	N/A
Fully Comply with Taxiway Separation Requirements Immediately (Not Phased): Suggested to include a full 500-foot separation between Runway 16L/34R and Taxiway B.	YES	NO Eliminated due to operational impacts and cost associated with implementation (Alternative 3-C2).
Limited or Reduced Growth: Suggested to reduce the project size, put in place policies to limit growth versus accommodating growth, or restrict usage of Runway 16R/34L.	NO Does not meet the stated needs and the Port / FAA have limited authority to restrict access to SEA.	N/A
Use of Other Existing Airports: Suggestion to use existing airports instead of expanding facilities at SEA.	NO Neither the Port nor FAA have the authority to require users to use another airport. In addition, none of the other existing airports, either individually or collectively, could accommodate the current or projected passenger and cargo demands within the needed timeframe.	N/A
Build a New Airport: Several commenters suggested constructing a new regional airport instead of expanding facilities at SEA.	NO Does not meet the stated need for serving 56 MAP at an optimal LOS at SEA.	N/A

TABLE 2-1: EVALUATION OF ALTERNATIVES FROM THE SCOPING PROCESS (CONTINUED)

Scoping Suggestion	Does it meet Purpose and Need? (Level 1 Screening)	If Yes, Other Considerations (Level 2 Screening)
Utilize Other Modes of Transportation: Suggestion to use other modes of transportation or technologies instead of expanding facilities at SEA. Examples included high-speed rail, "hyperloop," and mass transit.	NO Replacing aircraft operations with other modes of transportation would not provide the efficient long-distance connections needed to address current and future demand.	N/A
Limit the project to only the FAA compliance needs.	NO The suggestion does not address the other identified needs.	N/A
Eliminate North Employee Surface Parking Lot (L06): Suggestion to eliminate the proposed north employee surface parking lot (L06) and relocate them to new locations.	YES	The Proposed Action was updated after scoping to eliminate L06 and instead construct a larger employee parking garage (L07).
Public/Private Transit Incentives: Suggestion to implement incentives to reduce the need for the lots.	NO This suggestion on its own does not directly meet Purpose and Need. Reducing the amount of parking to force a shift in modes was not feasible, given employee shift times, transit availability, and historic employee behavior when demand has exceeded capacity.	N/A
Terminal Connection: Suggestion of a secure-side (post-security) connection between the Main Terminal and the proposed new gates.	N/A This suggestion on its own does not meet Purpose and Need. However, the Passenger Terminal and Concourse alternatives carried forward includes an option with a secure-side connection to Concourse D, as well as a secure-side connection from the proposed north gates to the North Satellite.	N/A

Source: Analysis completed by Landrum & Brown, 2020.

2.4 No Action Alternative

The No Action Alternative assumes none of the federal actions or the additional physical improvements included in the Proposed Action would occur at SEA, but includes projects that have recently been constructed, or will be constructed by 2032, as part of the future base case (which is the same for all alternatives carried forward). This includes North Satellite Redevelopment program, International Arrivals Facility, Terminal Renovations, C Concourse Expansion, A Concourse Building Expansion, Widen Arrivals Drive project, and Runway Renumbering. These projects are independent from the Proposed Action in this EA and have received or will receive separate environmental reviews and approvals.

2.5 Potential Action Alternatives

Because the Proposed Action reflects five separate and distinct areas of need, the alternatives development process considered each need separately. The potential action alternatives were developed from the range of alternatives considered during the SAMP process, scoping comments, and a separate assessment of potential options conducted specifically for this EA. **Appendix B** provides additional information related to the identification and evaluation of alternatives for each Need.

2.5.1 Need #1: Insufficient Passenger Processing Facilities and Gates to Accommodate 56 MAP at an Optimal LOS

Passenger processing alternatives were developed to address Need #1. These alternatives all include the following primary elements:

- Passenger Terminal and Concourse: Construct adequate passenger check-in facilities, baggage processing facilities, security screening checkpoints, and aircraft boarding gates to serve 56 MAP at an optimal LOS.
- Passenger Parking and Ground Access Facilities: Construct sufficient passenger parking facilities and arrival and departure curbs to accommodate 56 MAP at an optimal LOS.
- Employee Parking: Construct sufficient employee parking facilities to accommodate 56 MAP at an optimal LOS.

2.5.1.1 Passenger Terminal and Concourse Options

The key factors influencing development of the passenger processing facility and gate alternatives were the existing terminal area configuration and the built environment surrounding SEA. The Port considered how the terminal facilities could be expanded in all directions. The areas north and south of the existing terminal were found to provide the only reasonable opportunities for development. Expansion to the east would be infeasible given the location of SR 99, and the heavy development along that corridor. Relocation to the west is infeasible because it would either require a shift of all three parallel runways and associated taxiways, or the elimination of Runway 16L/34R, the primary departure runway at SEA.

Once a general development area was identified, extensive planning and concept development occurred as part of the SAMP process. In the initial stages, 16 different terminal concepts were identified and evaluated. These concepts included “one-terminal” and “two-terminal” concepts. One-terminal concepts maintain all passenger processing within the existing Main Terminal, modifying it to the extent possible to accommodate the forecast growth in passenger demand. Two-terminal concepts add a second passenger terminal and minimize modifications to the existing Main Terminal.[12]

It should be noted that passenger parking facilities and arrival and departure curbs are dependent on the terminal concourse option, due to space limitations. As a result, those elements do not have a separate alternatives analysis. The preliminary passenger processing facility alternatives, and their ability to meet the screening criteria, are summarized in **Table 2-2**. Employee parking alternatives are discussed in Section 2.5.1.2.

[12] SAMP Technical Memorandum No. 6, Alternatives; Chapter 1. Available for review at: https://www.airportprojects.net/sampenvironmentalreview/tm-alternatives/.

TABLE 2-2: NEED #1 – FIRST LEVEL SCREENING (DOES ALTERNATIVE MEET SEA'S NEEDS?)

Alternative Description	Criterion 1: Passenger Check-in Facilities	Criterion 2: Security Screening Checkpoint	Criterion 3: Aircraft Gates / Parking	Criterion 4: On-Airport Public Parking	Criterion 5: Departing and Arriving Curbs
Alternative 1-A: Proposed Action Construct a new Second Terminal to the north of the Main Terminal	YES	YES	YES	YES	YES
Alternative 1-B: Main Terminal Option Expand the Main Terminal	NO	NO	YES	YES	NO
Alternative 1-C: Hardstand Option Hardstand Approach – Expand Main Terminal and build satellite hardstand concourse	NO	NO	NO	YES	NO
Alternative 1-D: South Option Construct a new Second Terminal to the south	YES	YES	YES	YES	YES
Alternative 1-E: Hybrid Option Construct additional concourse north of the Main Terminal connected to Concourse D and construct a new Second Terminal to the north	YES	YES	YES	YES	YES

Source: Analysis completed by Landrum & Brown, 2020.

The results of the second level screening criteria for the preliminary passenger terminal facility alternatives are summarized in **Table 2-3**. Alternatives 1-A and 1-E were found to fully meet the Purpose and Need and have similar or better operational considerations and substantially lower cost when compared with Alternative 1-D. Therefore, these alternatives are reasonable and feasible and were carried forward for detailed environmental impact analysis.

TABLE 2-3: NEED #1 – SECOND LEVEL SCREENING

Alternative Description	Operational Criteria	Cost Criteria	Carried Forward?
Alternative 1-A: Proposed Action Construct a new Second Terminal to the north of the Main Terminal	• Impacts to Airport roadways during construction • Limited impacts to operation of existing terminal and concourses during construction • Improved LOS to passengers and users once constructed	Commensurate with the magnitude of the proposed construction	YES This alternative is reasonable and feasible and was carried forward for detailed environmental impact analysis.
Alternative 1-D: South Option Construct a new Second Terminal to the south	• Impacts to Airport roadways during construction • Substantially higher operational impacts after construction due to the additional gates and associated activity in an area that is already heavily congested during peak times, exacerbating airfield congestion • Improved LOS to passengers and users once constructed	Construction costs would be substantially higher than the Proposed Action due to relocation and / or replacement of additional facilities, extensive earthwork, and construction of additional airfield pavement	NO This alternative is not reasonable and was not carried forward for detailed environmental impact analysis.
Alternative 1-E: Hybrid Option Construct additional concourse to the north of the Main Terminal connected to Concourse D and construct a new Second Terminal to the north	• Impacts to Airport roadways during construction • Operational impacts due to temporary gate closures during construction • Improved LOS to passengers once constructed	Similar to the Proposed Action	YES This alternative is reasonable and feasible and was carried forward for detailed environmental impact analysis.

Source: Analysis completed by Landrum & Brown, 2020.

2.5.1.2 Employee Parking Options

Employee parking, which is not dependent on the terminal concourse option, has a separate alternatives evaluation to identify the Employee Parking Option carried forward as part of the terminal alternatives evaluated in this EA.

During scoping, several commenters requested that Proposed Action element L06 Employee Parking Surface Lot be removed or altered due primarily to concerns about additional traffic in the adjacent neighborhoods and impacts to North SeaTac Park. The Port reviewed the suggestions from the scoping comments and eliminated L06 as an option for employee parking.

Employee Parking Option 1: Provides incentives for employees to use mass transit. These incentives would include transit subsidies, promotion of ride-share opportunities, or other similar programs with an intent to reduce the overall number of employee vehicles being parked at the Airport, thereby eliminating the need to provide more employee parking capacity. Employee Parking Option 1 is not a feasible option to fully accommodate employee parking needs and is eliminated from consideration in this EA. However, the Port will continue to explore incentivized transit options for employees and passengers to reduce traffic at and around the Airport as part of its overall sustainability goals.

Employee Parking Option 2: Locates employee parking in an area on the south side of the Airport. A south location for the additional employee parking is not considered reasonable and is eliminated from consideration in this EA because it would require relocation of several facilities and more shuttle buses to access both the existing employee parking lot to the north and the new employee parking lot to the south.

Employee Parking Option 3: Adds an additional employee parking area on the north side of the Airport. From an operational perspective, consolidating employee parking into one general area provides an opportunity to operate fewer shuttle buses than if there were lots on both the north and south of the Airport (like Option 2), which would reduce traffic on the roadways at and around the Airport.

Based on the evaluation of each of the Employee Parking Options, the Port identified Employee Parking Option 3 as the only reasonable and feasible option. As a result, this Employee Parking Option is included as part of the Proposed Action with the other Need #1 alternatives.

2.5.2 Need #2: Insufficient Facilities to Accommodate Projected Cargo Levels

Cargo alternatives developed to address Need #2 include the necessary facilities to meet the projected warehousing facility needs and related cargo aircraft parking needs. The alternatives from the SAMP formed the initial list of potential alternatives for this analysis. The key factors that influenced the development of air cargo alternatives are the existing cargo conditions, projected cargo needs, the impact on airfield operations, and the impact of future passenger facilities in the area where the cargo functions are currently located. Alternatives were limited by the physical constraints at SEA and the space requirements of the cargo facilities. Given these factors, the only viable alternatives would place new facilities in the north or south areas of SEA.

The cargo alternatives were screened to eliminate the ones that would not fulfill the cargo-related Purpose and Need. The preliminary alternatives, and their ability to meet the screening criteria, are summarized in **Table 2-4**.

TABLE 2-4: NEED #2 – FIRST LEVEL SCREENING (DOES ALTERNATIVE MEET SEA'S NEEDS?)

Alternative Description	Cargo Aircraft Parking Positions (with airfield access)	Warehousing Facilities (with landside access)	Support Facilities
Alternative 2-A: Proposed Action Construct new cargo facilities in the North Cargo area, and on the Port's L-shaped parcel of land north of SR 518	YES	YES	YES
Alternative 2-B: South Option Construct new cargo facilities on the south side of SEA (south aviation support area)	YES	YES	YES

Source: Analysis completed by Landrum & Brown, 2020.

The results of the second level screening for the preliminary cargo alternatives are summarized in **Table 2-5**. Alternative 2-A was found to fully meet the Purpose and Need and would have substantially fewer operational impacts and less cost when compared with Alternative 2-B. Therefore, this alternative is reasonable and feasible and was carried forward for detailed environmental impact analysis.

TABLE 2-5: NEED #2 – SECOND LEVEL SCREENING

Alternative Description	Operational	Cost	Carried Forward?
Alternative 2-A: Proposed Action Construct new cargo facilities in the North Cargo area, and on the Port's L-shaped parcel of land north of SR 518	• Limited impacts to operation of existing Airport during construction • Increased cargo facilities once constructed	Commensurate with the magnitude of the proposed construction	YES This alternative is reasonable and feasible and was carried forward for detailed environmental impact analysis.
Alternative 2-B: South Option Construct new cargo facilities on the south side of SEA (south aviation support area)	• Impacts to Airport roadways during construction • Increased cargo facilities once constructed • Substantially higher operational impacts after construction due to additional congestion on Taxiways A and B near the passenger terminal area from having more cargo aircraft and support vehicles moving between the two cargo sites	Construction costs would be substantially higher than the Proposed Action due to the need for new access roads, bridges, and additional cargo apron; additional earthwork, and relocation / replacement of facilities. The level of additional cost would preclude construction in the timeframe when the improvements are needed.	NO This alternative is not reasonable or feasible and was not carried forward for detailed environmental impact analysis.

Source: Analysis completed by Landrum & Brown, 2020.

2.5.3 Need #3: Portions of the Airfield No Longer Meet Current FAA Airport Design Standards

Preliminary alternatives were developed to address the areas of the airfield that are no longer in compliance with FAA design standards (Need #3). One of the key factors that influenced the development of the FAA airfield design standards alternatives is the ability to bring an area up to standards without unreasonable impacts to other important airport functions. The preliminary alternatives, and their ability to meet the screening criteria, are summarized in **Table 2-6**.

TABLE 2-6: NEED #3 – FIRST LEVEL SCREENING (DOES ALTERNATIVE MEET SEA'S NEEDS?)

Alternative Description	Runway 16R/34L Blast Pads	Taxiway Geometry	Taxiway B Separation
Non-Standard Blast Pads Alternative 3-A1 (Proposed Action): Expand Runway 16R/34L blast pads to meet standards	YES	N/A	N/A
Non-Standard Blast Pads Alternative 3-A2 (Existing Blast Pad Option): Meet standards by using existing runway pavement, with a shortened useable length for takeoffs	YES	N/A	N/A
Non-standard Taxiway Geometry Alternative 3-B (Proposed Action): Reconfigure non-standard taxiway geometry	N/A	YES	N/A
Taxiway B Separation Alternative 3-C1 (Proposed Action) Reconfigure Taxiway B in the areas where other project elements are being constructed to provide 500-foot separation to partially meet standards	N/A	N/A	YES
Taxiway B Separation Alternative 3-C2 (Full Separation Option) Provide full 500-foot separation from Taxiway 16L/34R	N/A	N/A	YES

Note: None of the alternatives meet all needs. The alternatives only meet a specific FAA Airport Design Standard need.
Source: Analysis completed by Landrum & Brown, 2020.

Alternative 3-B (Proposed Action for Reconfigure Non-standard Taxiway Geometry) was found to satisfy the first level screening criteria and there are no additional alternatives identified (aside from the No Action Alternative). Therefore, second level screening was not required. The results of the second level screening of the FAA design standards for the remaining alternatives are summarized in **Table 2-7**. Based on the second level screening, Alternative 3-A1 and Alternative 3-C1, in addition to Alternative 3-B, are carried forward for detailed evaluation.

TABLE 2-7: NEED #3 – SECOND LEVEL SCREENING

Alternative Description	Operational Criteria	Cost Criteria	Carried Forward?
Non-Standard Blast Pads Alternative 3-A1 (Proposed Action)	• Limited impacts to operation of existing Airport during construction • No impact after construction	Minor cost	YES This alternative is reasonable and feasible and was carried forward for detailed environmental impact analysis.
Non-Standard Blast Pads Alternative 3-A2 (Existing Blast Pad Option)	• Limited impacts to operation of existing Airport during construction • Reduction in airfield capability after construction	Minor cost	NO This alternative is not reasonable and was not carried forward for detailed environmental impact analysis.
Taxiway B Separation Alternative 3-C1 (Proposed Action)	• Limited impacts to operation of existing Airport during construction • Bring more of the airfield into compliance with FAA requirements; FAA MOS would continue	Minor cost	YES This alternative is reasonable and feasible and was carried forward for detailed environmental impact analysis.
Taxiway B Separation Alternative 3-C2: (Full Separation Option)	• Substantial impacts to existing Airport due to permanent and temporary aircraft gate closures • Brings entire taxiway into compliance with FAA requirements	Construction costs would be substantially higher than the Proposed Action	NO This alternative is not reasonable and was not carried forward for detailed environmental impact analysis.

Source: Analysis completed by Landrum & Brown, 2020.

2.5.4 Need #4: Inefficient / Inadequate Taxiway Layout

Alternatives to address Need #4 focused on two areas of the airfield (the south end of Runway 16L/34R and west of Runway 16C/34C). These areas were examined because operational efficiency could be improved, and improvements can be provided without affecting other airfield or Airport functions. The preliminary alternatives, and their ability to meet the screening criteria, are summarized in **Table 2-8**.

TABLE 2-8: NEED #4 – FIRST LEVEL SCREENING (DOES ALTERNATIVE MEET SEA'S NEEDS?)

Alternative Description	South End of Runway 16L/34R	West of Runway 16C/34C
South End of Runway 16L/34R Alternative 4-A (Proposed Action) for South End of Runway 16L/34R): Taxiway A/B Extension at south end of Runway 16L/34R	YES	N/A
West of Runway 16C/34C Alternative 4-B (Proposed Action) for West of Runway 16C/34C): Construct new high-speed taxiway exits from Runway 16R/34L, and a new crossing of Runway 16C/34C	N/A	YES

Note: Neither alternative meets all needs. The alternatives only meet a specific taxiway layout need.
Source: Analysis completed by Landrum & Brown, 2020.

Both Alternatives 4-A (Proposed Action for South End of Runway 16L/34R) and 4-B (Proposed Action for West of Runway 16C/34C) were found to satisfy the first level screening criteria related to their specific area of need, and there were no additional alternatives identified (aside from the No Action Alternative). Therefore, second level screening was not required and both alternatives are carried forward for detailed evaluation.

2.5.5 Need #5: Lack of Fuel Storage to Meet Projected Demand and the Port's SAF Initiative

Alternatives were developed that would provide the necessary facilities to meet the projected fuel storage demand at SEA and meet the Port's SAF initiative (Need #5). The key factors that influenced the development of fuel storage alternatives are location and security, given the potential risks associated with the storage of large quantities of fuel. Airport related fuel facilities are typically located in areas with substantial security, lighting, fencing, and access control, and away from aircraft activity. The Port studied potential options related to integrating SAF into SEA's fuel distribution system. That study concluded a small SAF receiving and blending facility at the SEA fuel farm would be the most cost-effective solution in the short-term and would also fulfill an existing critical need for additional local fuel receipt and storage capacity that is not dependent on the Olympic Pipeline.[13] Given the results of that study and the general requirements for fuel storage, the areas available to meet the need within the existing land envelope of SEA were explored. The preliminary alternatives and their ability to meet the screening criteria are summarized in **Table 2-9**.

[13] Aviation Biofuels Infrastructure Feasibility Study, prepared for Port, Boeing, and Alaska Airlines, November 2016. Available for review at: https://www.airportprojects.net/sampenvironmentalreview/aviation-biofuel-infrastructure-report/.

TABLE 2-9: NEED #5 – FIRST LEVEL SCREENING (DOES ALTERNATIVE MEET SEA'S NEEDS?)

Alternative Description	Size of Site	Access to Existing Fuel Delivery System	Vehicular Access
Alternative 5-A (Proposed Action) Expand existing fuel farm	YES	YES	YES
Alternative 5-B (New Facility Option): Construct new facilities to supplement or replace the current facilities at the S. 156th Way staging area	YES	NO	YES

Source: Analysis completed by Landrum & Brown, 2020.

Because only Alternative 5-A satisfied the first level screening criteria (aside from the No Action Alternative), no second level screening was necessary.

2.6 Alternatives Being Carried Forward

Based on the analysis of the alternatives for the individual needs, the following alternatives were carried forward for detailed environmental impact analysis:

- **Alternative 1: No Action**: The No Action Alternative provides a baseline for comparison to the other action alternatives even though it would not meet the Purpose and Need.
- **Alternative 2: Proposed Action**: The Proposed Action represents a composite of the following elements:
    - Alternative 1-A: Construct a new Second Terminal and gates (T01, T02) to the north of the existing terminal to provide the necessary facilities to serve 56 MAP at an optimal LOS[14].
    - Alternative 2-A: Construct new cargo facilities in the North Cargo area (A08, C01, S08, S09) and on the Port's L-shaped parcel of land (C02, C03) to meet the projected cargo demand, and construct the Westside Maintenance Facility (S07) west of the airfield.
    - Alternative 3-A1: Extend/expand the blast pads for Runway 16R/34L from 200 feet by 200 feet to 220 feet by 400 feet to meet FAA standards (A02).
    - Alternative 3-B: Reconfigure non-standard taxiway geometry to meet FAA standards (A03, A10).
    - Alternative 3-C1: Reconfigure Taxiway B in the areas where other project elements are being constructed to provide 500-foot separation to partially meet FAA standards (A04).
    - Alternative 4-A: Extend Taxiway A/B at south end of Runway 16L/34R, creating a new parallel taxiway system to improve efficiency in the south airfield (A01).
    - Alternative 4-B: Construct a new high-speed taxiway exit from Runway 16R/34L (A06), and a new crossing of Runway 16C/34C (A07) to provide a more efficient connection to the terminal area and create additional holding areas for taxiing aircraft.
    - Alternative 5-A: Expand existing fuel farm to meet projected demand, including additional storage tanks, a blending tank, a SAF receipt tank, and associated support areas, utilizing the existing fuel distribution system connection (S01).

[14] Also includes projects A05, A09, L01, L02, L03, L04, L05, L07, S02, S03, S04, S05, S06, and S10.

- **Alternative 3: Hybrid Terminal Option**: The Hybrid Terminal Option includes the same elements as Alternative 2: Proposed Action except for terminal and gate location. For consistency, the complete description is as follows:

  - Alternative 1-E: Construct a new concourse and gates (T01a) to the north of the Main Terminal connected to Concourse D and a new Second Terminal across the NAE (T02) to provide facilities necessary to accommodate 56 MAP at an optimal LOS[15].
  - Alternative 2-A: Construct new cargo facilities in the North Cargo area (A08, C01, S08, S09) and on the Port's L-shaped parcel of land (C02, C03) to meet the projected cargo demand, and construct the Westside Maintenance Facility (S07) west of the airfield.
  - Alternative 3-A1: Extend/expand the blast pads for Runway 16R/34L from 200 feet by 200 feet to 220 feet by 400 feet to meet FAA standards.
  - Alternative 3-B: Reconfigure non-standard taxiway geometry to meet FAA standards (A03, A10).
  - Alternative 3-C1: Reconfigure Taxiway B in the areas where other project elements are being constructed to provide 500-foot separation to partially meet FAA standards (A04).
  - Alternative 4-A: Extend Taxiway A/B at south end of Runway 16L/34R, creating a new parallel taxiway system to improve efficiency in the south airfield (A01).
  - Alternative 4-B: Construct a new high-speed taxiway exit from Runway 16R/34L (A06), and a new crossing of Runway 16C/34C (A07) to provide a more efficient connection to the terminal area and create additional holding areas for taxiing aircraft.
  - Alternative 5-A: Expand existing fuel farm to meet projected demand, including additional storage tanks, a blending tank, a SAF receipt tank, and associated support areas, utilizing the existing fuel distribution system connection (S01).

[15] Also includes projects A05, A09, L01, L02, L03, L04, L05, L07, S02, S03, S04, S05, S06, S10, and an extension of the Main Terminal.

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3 Affected Environment

The affected environment chapter provides a description of the conditions in 2022 (referred to as "Existing Condition") in and around the vicinity of SEA that may be directly or indirectly affected by the Proposed Action or alternatives. The year 2022 was chosen because it was the last full year for which a complete inventory of annual statistical data was available for SEA after the construction schedule was revised and the forecast was updated.

3.1 Airport Setting and Location

SEA is located primarily within the City of SeaTac in southern King County, Washington, 12 miles south of downtown Seattle, and 20 miles north of the City of Tacoma (**Exhibit 3-1**). SEA is located on approximately 2,800 acres of land generally bound by SR 99 to the east, SR 509 to the west, S. 142nd Place to the north, and S. 200th Street to the south. Additional land owned by the Port and used for runway protection and noise compatibility extends northward to S. 136th Street and southward to S. 216th Street.

Cities nearest to SEA include Burien, Des Moines, Normandy Park, SeaTac, and Tukwila, as well as portions of unincorporated King County. Other nearby cities include Federal Way, Kent, and Seattle. The predominant land use nearest to SEA is residential, with local commercial and some industrial areas. Land uses directly adjacent to Airport property include park land, residential, industrial, and commercial. **Exhibit 3-1** shows SEA and the general pattern of nearby development.

3.2 Identification of the Study Area

The General Study Area (GSA) (see **Exhibit 3-2**) represents the area where reasonably foreseeable direct or indirect impacts may occur as a result of implementing the Proposed Action or alternatives. The GSA includes an area encompassing 3,692 acres (5.8 square miles). The GSA is loosely bounded by S. 140th Street to the north, 33rd Avenue S. to the east, S. 20th Street to the south, and Des Moines Way to the west. The study area for certain resources varies from the GSA. Where that occurs, the applicable study area is explained in the resource section.

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EXHIBIT 3-1: AIRPORT ENVIRONS

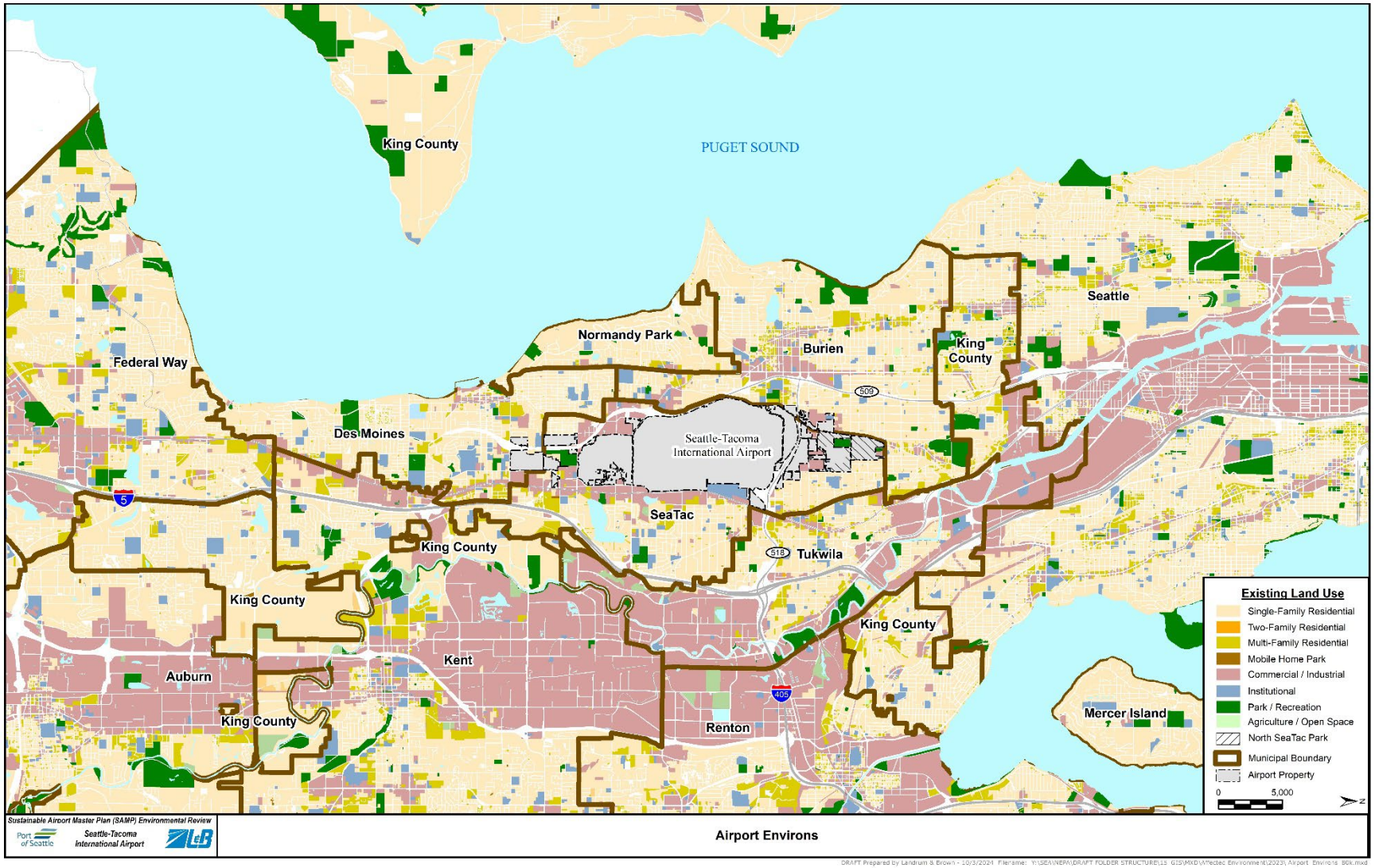

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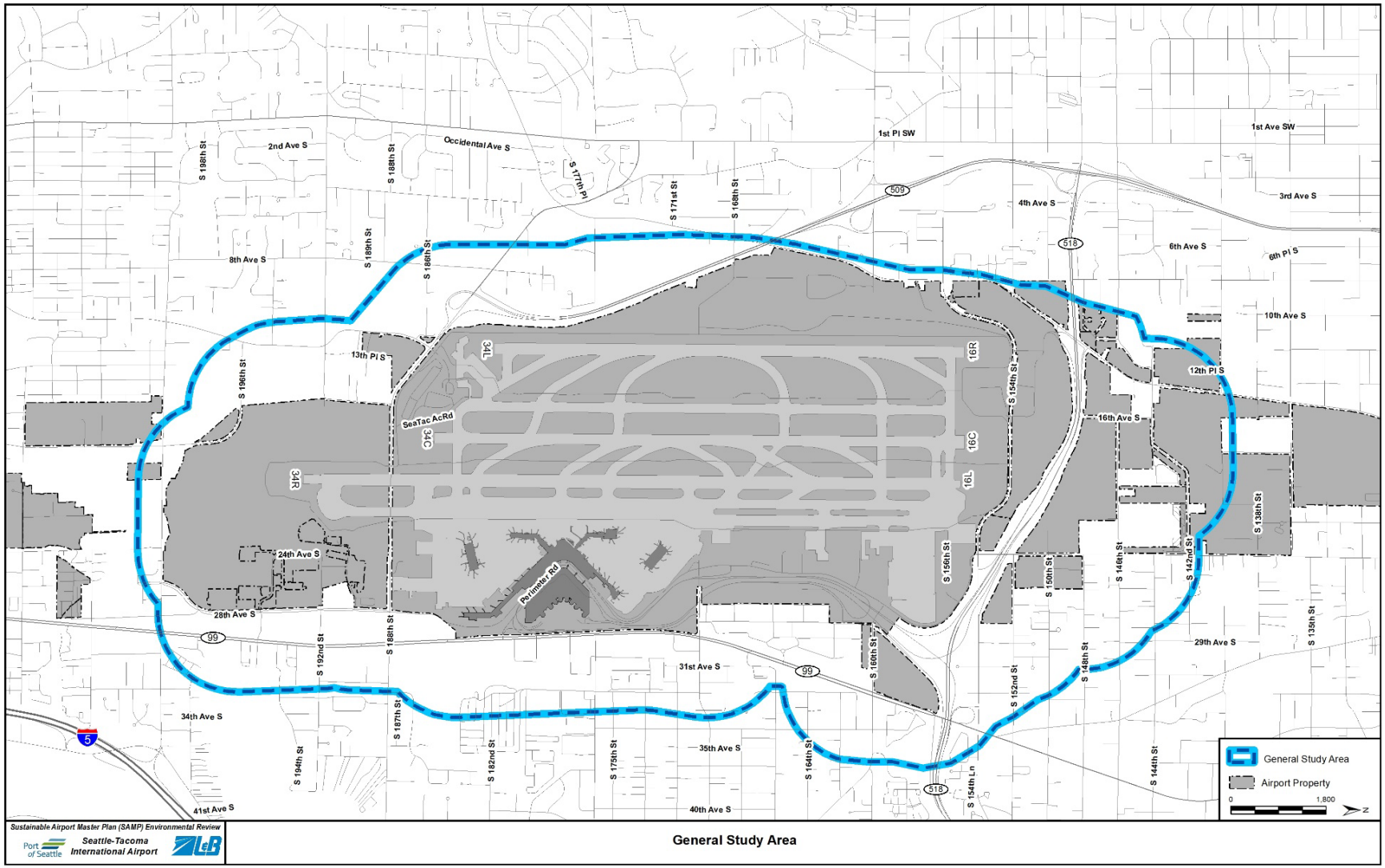
EXHIBIT 3-2: GENERAL STUDY AREA (GSA)



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3.3 Environmental Resources

3.3.1 Air Quality

Air quality is the measure of the condition of the air expressed in terms of ambient pollutant concentrations and their temporal and spatial distribution. Air quality regulations are based on concerns that high concentrations of air pollutants can harm human health, especially for children, the elderly, and people with compromised health conditions; as well as adversely affect public welfare by damage to crops, vegetation, buildings, and other property. **Appendix C, Air Quality and Greenhouse Gas Emissions,** provides detailed information on regulations, methodology, and the Air Quality and Greenhouse Gas Technical Report.

3.3.1.1 Regulatory Setting

Under the Clean Air Act (CAA) the U.S. Environmental Protection Agency (USEPA) established the National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and welfare (criteria air pollutants) (**Table 3-1**). These standards have been established for the following criteria air pollutants: carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), particulate matter less than or equal to ten microns aerodynamic diameter (PM_{10}), fine particulate matter less than or equal to 2.5 microns aerodynamic diameter ($PM_{2.5}$), and lead (Pb). Because emissions of O_3 cannot be calculated directly, volatile organic compounds (VOCs) and oxides of nitrogen (NO_X) (precursors to O_3 formation) are used as surrogates.

TABLE 3-1: STATUTE RELATED TO THE PROTECTION OF AIR QUALITY

Statute	U.S. Code Implementing Regulation	Oversight Agency	Summary
Clean Air Act (CAA)	42 U.S.C. §§ 7401-767q 40 CFR parts 6, 9, 50-53, 60, 61, 63, 66, 67, 81, 82 and 83	USEPA	Regulates air pollutant emissions from stationary and mobile sources; authorizes USEPA to establish NAAQS for criteria pollutants

For each of the six criteria pollutants, the USEPA established primary NAAQS intended to protect public health, and secondary standards for the protection of public welfare. The NAAQS are summarized in **Table 3-2**. All areas of the country are required to demonstrate attainment with the NAAQS. Attainment areas are areas where pollutant levels have not exceeded the NAAQS, whereas nonattainment areas are those where one or more NAAQS were exceeded. Maintenance areas are areas that previously exceeded the NAAQS but currently meet the standards. States with nonattainment or maintenance areas are required to have a State Implementation Plan (SIP) in place to identify how the region will attain the NAAQS. Maintenance areas are subject to a SIP for two consecutive 10-year periods (20 years) after reaching attainment to ensure continued attainment.

In addition to these federal requirements, SEA is subject to state and local air quality regulations that the Washington State Department of Ecology (WSDE) and Puget Sound Clean Air Agency (PSCAA) enforce, respectively. Based on the Air Quality Data Summary for 2022 prepared by the PSCAA, the State of Washington and the Puget Sound region have adopted the USEPA's NAAQS.[16,17]

[16] Puget Sound Clean Air Agency. 2022 Air Quality Data Summary, December 2023. https://pscleanair.gov/DocumentCenter/View/5360.

[17] The Puget Sound Clean Air Agency has developed an air quality health goal for daily $PM_{2.5}$ concentrations. The health goal of 25 µg/m^3 for a daily average is more protective than the current federal standard of 35 µg/m^3. However, the State of Washington has not approved this health goal as an ambient air quality standard.

TABLE 3-2: NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS)

Pollutant	Primary / Secondary	Averaging Time	Level	Form Of Measurement
Carbon Monoxide (CO)	Primary	8 hour	9 ppm	Not to be exceeded more than once per year
Carbon Monoxide (CO)	Primary	1 hour	35 ppm	Not to be exceeded more than once per year
Lead (Pb)	Primary and Secondary	Rolling 3-month average	0.15 µg / m^3 (1)	Not to be exceeded
Nitrogen Dioxide (NO_2)	Primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
Nitrogen Dioxide (NO_2)	Primary and Secondary	1 year	53 ppb (2)	Annual Mean
Ozone (O_3)	Primary and Secondary	8 hours	0.070 ppm (3)	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particulate Matter ($PM_{2.5}$)	Primary	1 year	9.0 µg / m^3	Annual mean, averaged over 3 years
Particulate Matter ($PM_{2.5}$)	Secondary	1 year	15.0 µg / m^3	Annual mean, averaged over 3 years
Particulate Matter ($PM_{2.5}$)	Primary and Secondary	24 hours	35 µg / m^3	98th percentile, averaged over 3 years
Particulate Matter (PM_{10})	Primary and Secondary	24 hours	150 µg / m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO_2)	Primary	1 hour	75 ppb (4)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
Sulfur Dioxide (SO_2)	Secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

(1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg / m^3 as a calendar quarter average) also remain in effect.
(2) The level of the annual NO_2 standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.
(3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O_3 standards are not revoked and remain in effect for designated areas. Additionally, some areas may have certain continuing implementation obligations under the prior revoked 1-hour (1979) and 8-hour (1997) O_3 standards.
(4) The previous SO_2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO_2 standards or is not meeting the requirements of a SIP call under the previous SO_2 standards (40 CFR 50.4(3)). A SIP call is a USEPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.
Note: ppm is parts per million; ppb is parts per billion and µg / m^3 is micrograms per cubic meter.
Source: USEPA, https://www.epa.gov/criteria-air-pollutants/naaqs-table, accessed March 2024.

3.3.1.2 King County Air Quality Status

SEA is located within King County, Washington, which is included in the Puget Sound Intrastate Air Quality Control Region. The area was previously designated maintenance for ozone under the 1-hour 1979 ozone standard; however, the 1-hour standard was revoked by USEPA effective June 15, 2005. The maintenance period for ozone ended on November 25, 2016.[18] The region is currently designated as in attainment for both the 2015 and 2008 8-hour ozone standard.

In the past, King County was also designated as nonattainment for CO; however, on October 11, 1996, the USEPA determined the area had attained the standard and the region was redesignated to attainment of the 1971 standard. The maintenance period for CO ended on October 11, 2016.[19] Several areas within King County are classified as maintenance for the PM_{10} (coarse particles) standard. The Airport is not within any of these areas. Therefore, the Proposed Action would occur in an area considered in attainment for all criteria pollutants.

3.3.1.3 Existing Conditions

The air quality analysis completed for this EA considered the sources of emissions and local meteorology. Sources of emissions, such as ground support equipment (GSE) or stationary sources, are limited to the project site. The analysis of aircraft operations extends beyond the project site (Port-owned property) up to the mixing height, which is where air pollutants are "capped" from going higher by relative air temperature. The mixing height used in this assessment is defined as 3,084 feet in altitude above field elevation based on the USEPA's *Mixing Heights, Wind Speeds, and Potential for Urban Air Pollution Throughout the Contiguous United States*, as recommended by the FAA and concurred by the PSCAA. Furthermore, the analysis included impacts associated with potential changes to motor vehicle traffic on the surrounding road network. The vehicle traffic analysis included volumes reflecting (1) vehicles traveling Airport roadways; (2) vehicles accessing parking facilities; (3) vehicles accessing the terminal curbside areas for passenger pick-up and drop-off; and (4) vehicles traveling off-Airport roadways.

Methodology

Emissions were evaluated using the FAA's Aviation Environmental Design Tool (AEDT) Version 3f. AEDT models aircraft performance in space and time to estimate fuel consumption, air quality emissions, and noise consequences at airports. Emission factors for motor vehicles were derived from the USEPA's Motor Vehicle Emissions Simulator (MOVES) model version 4. The approach was developed and coordinated with the FAA and the PSCAA.

[18] Washington State Department of Ecology. Plans for Maintaining Air Quality. https://ecology.wa.gov/Regulations-Permits/Plans-policies/State-implementation-plans/Maintenance-SIPs, accessed December 2023.
[19] Ibid.

Existing Condition Criteria Pollutant Emissions Inventory

An emissions inventory for the Existing Condition is a summary of the total criteria air pollutants generated by all active emissions sources that may be affected by the Proposed Action. The emissions inventory provides the total annual pollutant emissions as short tons per year.[20] The emissions inventory for the Existing Condition is shown in **Table 3-3**. The analysis included criteria air pollutants CO, NO_2, PM_{10}, $PM_{2.5}$, SO_2 and ozone precursor pollutants NO_x and VOCs. Lead was not included because Avgas (the only aviation fuel containing lead) fueling ceased at SEA in 2018 and the Proposed Action does not involve any potentially significant source of lead emissions.

In terms of total tons of emissions occurring in 2022, the largest quantity of criteria pollutants emitted was CO at 5,178 short tons followed by the two ozone precursors NO_x and VOC at 2,537 and 332 short tons respectively. The dominant source of emissions of all criteria pollutants was from aircraft operations and motor vehicles.

TABLE 3-3: EXISTING (2022) CONDITION ANNUAL EMISSIONS INVENTORY (SHORT TONS PER YEAR)

Emissions Source	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Aircraft	**1,798**	**255**	**2,081**	**186**	**21**	**21**
LTO (includes Start-Up, Approach, Climb, and Taxiing)	1,681	244	1,977	175	12	12
APUs	1	0	44	2	0	0
Aircraft Run-Ups	116	10	60	9	9	9
GSE	**196**	**6**	**17**	**0**	**1**	**1**
Tenant-Owned GSE	193	6	13	0	1	1
Port-Owned Airfield Vehicles and Equipment	3	0	4	0	0	0
Stationary Sources	**15**	**10**	**25**	**33**	**1**	**1**
Natural Gas Boilers	13	1	16	0	0	0
Diesel Generators	2	0	10	33	0	0
Fuel Farm Tanks	0	9	0	0	0	0
Motor Vehicles	**3,169**	**60**	**413**	**2**	**8**	**8**
Parking Facilities	52	2	6	0	0	0
On and Off-Airport Roadways (includes Airside Deliveries)	3,117	58	408	2	8	8
Total	**5,178**	**332**	**2,537**	**221**	**31**	**31**

SO_x= sulfur oxides, PM_{10}=coarse particulate matter, $PM_{2.5}$= fine particulate matter, LTO = landing / take-off cycle, APU = auxiliary power unit
Note: Totals may not sum due to rounding; Zeros may not indicate an absolute zero value.
Source: Port of Seattle and Landrum & Brown, 2023.

3.3.2 Biological Resources

Biological resources are valued for their intrinsic, aesthetic, economic, and recreational qualities. Typical categories of biological resources include terrestrial and aquatic plant and animal species; game and non-game species; special status species (state or federally-listed threatened or endangered species, or species of concern); and environmentally-sensitive or critical habitats. Detailed information, including survey data, is provided in **Appendix D, Biological Resources**.

[20] A short ton in the United States is commonly just called a ton. One short ton equals 2,000 pounds.

3.3.2.1 Regulatory Setting

TABLE 3-4: STATUTES, REGULATIONS, EXECUTIVE ORDERS, AND OTHER REQUIREMENTS RELATED TO BIOLOGICAL RESOURCES

Statute	U.S. Code Implementing Regulation	Oversight Agency	Summary
Bald and Golden Eagle Protection Act	16 U.S.C. § 668 et seq. 50 CFR part 22	USFWS	Protects bald and golden eagles from the unauthorized capture, purchase, or transportation of the birds, nests, or eggs.
Endangered Species Act	16 U.S.C. §§ 1531-1544 50 CFR parts 17 and 402	USFWS; NMFS	Requires federal agencies to seek to conserve threatened and endangered species. Section 7(a)(2) requires federal agencies, in consultation with the USFWS and / or NMFS, to ensure that any action the agency authorizes, funds, or carries out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat.
Fish and Wildlife Coordination Act	16 U.S.C. §§ 661-667d	USFWS	Requires federal agencies to consult with the USFWS, NMFS (in some instances), and appropriate state fish and wildlife agencies regarding the conservation of wildlife resources when proposed federal projects may result in control or modification of the water of any stream or other water body.
Magnuson-Stevens Fishery Conservation and Management Act	16 U.S.C. § 1801 et seq. 50 CFR part 600	NMFS	Governs the conservation and management of ocean fishing, including essential fish habitat.
Marine Mammal Protection Act	16 U.S.C. § 1361 et seq. 50 CFR parts 18 and 216	NMFS, USFWS	Protects all marine mammals and prohibits, with certain exceptions, the take of marine mammals in U.S. waters and by U.S. citizens on the high seas.
Migratory Bird Treaty Act	16 U.S.C. § 703 et seq.50 CFR part 21	USFWS	Protects migratory birds by prohibiting private parties (and federal agencies in certain judicial circuits) from intentionally taking, selling, or conducting other activities that would harm migratory birds, their eggs, or nests (such as removal of an active nest or nest tree), unless the USFWS authorizes such activities under a special permit.
Executive Order 13751, Safeguarding the Nation from the impacts of Invasive Species	81 Federal Register 88609, December 5, 2016	Not Applicable	Federal agencies must prevent the introduction, establishment, and spread of invasive species, as well as to eradicate and control populations of invasive species that are established.

TABLE 3-4: STATUTES, REGULATIONS, EXECUTIVE ORDERS, AND OTHER REQUIREMENTS RELATED TO BIOLOGICAL RESOURCES (CONTINUED)

Statute	U.S. Code Implementing Regulation	Oversight Agency	Summary
Executive Order 13112, Invasive Species	64 Federal Register 6183, (February 8, 1999)	Not Applicable	Federal agencies whose actions may affect the status of invasive species are directed to use relevant programs and authorities, to the extent practicable and subject to available resources, to prevent the introduction of invasive species, and to provide for the restoration of native species and habitat conditions in ecosystems that have been invaded. Agencies are directed not to carry out actions that they believe are likely to cause or promote the introduction or spread of invasive species unless the benefits of such actions clearly outweigh the potential harm, and all feasible and prudent measures to minimize risk of harm are taken.

Note: NMFS = National Marine Fisheries Service; USFWS = U.S. Fish and Wildlife Service.

3.3.2.2 Existing Conditions

NMFS defined an Endangered Species Act (ESA)-listed species study area specifically to assess impacts to ESA-listed species and habitat as part of Section 7 consultation, as shown in **Exhibit 3-3**. The ESA Study Area includes areas where NMFS indicated direct effects may occur from the construction of the NTPs and where indirect effects may occur from stormwater runoff. It includes most of the GSA and streams receiving stormwater from the GSA to the Puget Sound. The GSA was used to assess impacts to all other species.

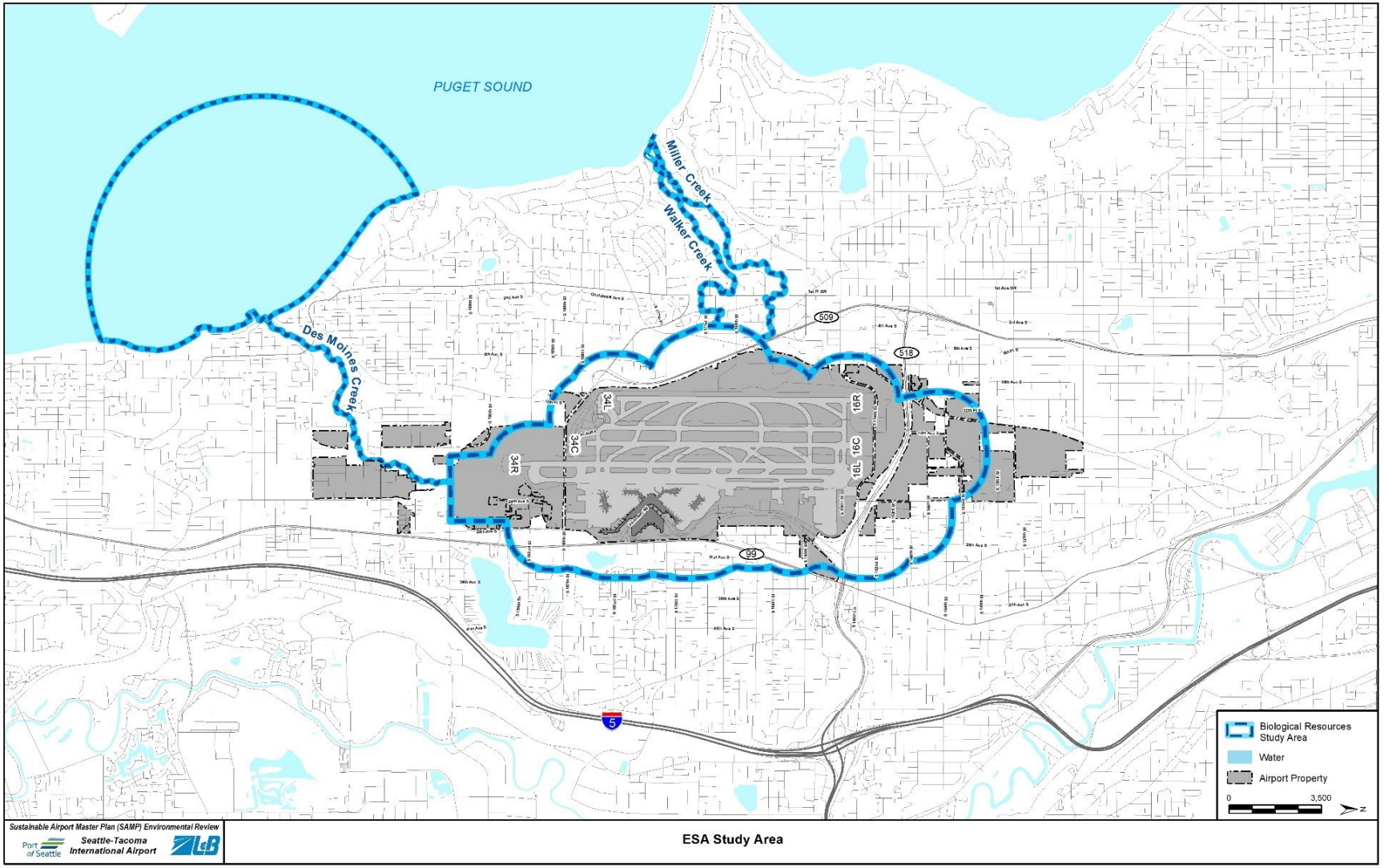
Both study areas are composed primarily of developed areas (buildings and paved surfaces) with areas of vegetated habitats (managed strips adjacent to runways and taxiways, open fields and shrublands, forested areas, stormwater ponds, and wetlands). Vegetated habitats are actively managed to prevent flight corridor obstructions and wildlife hazards. A field reconnaissance survey of affected habitats within the GSA was conducted in October of 2019, as well as a review of previous studies, species databases, and wildlife surveys in 2019, 2021, 2023, and 2024.

Fish and Wildlife

Common bird species present within the GSA include waterfowl (geese and ducks), gulls, pigeons, starlings, and raptors (hawks and owls). Common animals include coyotes, mice, rabbits, racoons, beavers, and several fish species.

The Airport has a comprehensive wildlife management program to make the Airport less attractive to wildlife that could interfere with flight operations, thus ensuring a safe environment for aviation and passengers. This program includes measures such as wildlife deterrent fencing around the perimeter of the airfield and a trapping and relocation program implemented by wildlife biologists. This approach balances wildlife protection and habitat requirements with aviation safety. The Port also works with local jurisdictions to establish an area extending 10,000 feet beyond SEA within which new development is reviewed for potential wildlife attractiveness that could impact aviation safety.

EXHIBIT 3-3: ESA STUDY AREA



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Endangered Species Act (ESA)

Species lists from the USFWS and the NMFS were obtained for this review in November 2019, September 2021, August 2023, April 2024, and June 2025. These lists indicate that several ESA-listed species and designated critical habitat have the potential to occur within the ESA Study Area (see **Table 3-5)**.

TABLE 3-5: ESA-LISTED ANIMAL SPECIES AND DESIGNATED CRITICAL HABITAT

Species	Listing Status	Critical Habitat	Notes
North American Wolverine	Threatened 11/30/2023 88 FR 83726	Not proposed in WA.	No suitable habitat for this species.
Marbled murrelet – Washington, Oregon, and California	Threatened 10/01/1992 57 FR 45328	Designated 08/04/2016 81 FR 51348	No suitable habitat for this species.
Yellow-billed cuckoo – Western U.S.	Threatened 11/03/2014 79 FR 59991	Not proposed in WA.	This species has been extirpated from WA and occurs as a periodic migrant.
Northwestern Pond Turtle	Proposed Threatened 10/03/2023 88 FR 68370	Not proposed in WA.	No suitable habitat for this species.
Bull Trout – Coastal-Puget Sound	Threatened 11/01/1999 64 FR 58910	Designated 10/18/2010 75 FR 63898	Documented to occur in the Puget Sound.
Chinook Salmon – Puget Sound	Threatened 06/28/2005 04/14/14 70 FR 37160	Designated 09/02/2005 70 FR 52630	Documented migration and foraging habitat present in Puget Sound. Documented in Miller Creek and (gradient accessible) in Walker Creek and Des Moines Creek.
Steelhead – Puget Sound	Threatened 04/14/2014 79 FR 20802	Designated 02/24/2016 81 FR 9252	Documented migration and foraging habitat present in the Puget Sound. Documented (gradient accessible) in Miller Creek, Walker Creek, and Des Moines Creek.
Yelloweye Rockfish – Puget Sound/Georgia Basin	Threatened 4/28/2010 75 FR 22276	Designated 11/3/2014 79 FR 68041	Planktonic eggs and larvae, post-settlement juvenile, and adult could occur in Puget Sound.
Bocaccio Rockfish – Puget Sound/Georgia Basin	Endangered 4/28/2010 75 FR 22276	Designated 11/3/2014 79 FR 68041	Planktonic eggs and larvae, post-settlement juvenile, and adult could occur in Puget Sound.
Southern Resident Killer Whale (SRKW)	Endangered 11/18/2005 70 FR 57565	Proposed 08/29/2021 84 FR 41668	SRKW migration and foraging habitat present in Puget Sound.
Humpback whale – Central America and Western North Pacific	Endangered 12/02/1970 81 FR 62259	Designated 4/21/2021 86 FR 21082	This species is not likely found in the Study Area.

TABLE 3-5: ESA-LISTED ANIMAL SPECIES AND DESIGNATED CRITICAL HABITAT (CONTINUED)

Species	Listing Status	Critical Habitat	Notes
Southern green sturgeon	Threatened 04/07/2006 71 FR 17757	Designated 10/09/2009 50 CFR 226.219	No suitable habitat for this species.
Southern Pacific eulachon	Threatened 03/18/2010 75 FR 13012	Designated 10/20/2011 76 FR 65323	No suitable habitat for this species.
Monarch Butterfly	Proposed Threatened 12/12/2024 88 FR 100662	No critical habitat has been designated for this species.	Milkweed is not native to King County. Limited potential for the monarch butterfly to be within Study Area.
Suckley's Cuckoo Bumble Bee	Proposed Endangered 12/17/2024 89 FR 102074	Critical habitat has not been proposed in Washington.	There is limited potential for Suckley's Cuckoo Bumble bee to be within Study Area.
Swamp / Marsh Sandwort	Endangered 08/03/1993 58 FR 41378	No critical habitat has been designated for this species.	No suitable habitat for this species.

Sources: NMFS (2019, 2021, 2023, 2024, 2025); USFWS (2019, 2021, 2023, 2024, 2025); National Oceanographic and Atmospheric Administration (NOAA) (2019, 2021, 2023, 2024, 2025).

Migratory Bird Treaty Act (MBTA) and Bald and Golden Eagle Protection Act (BGPA)

Most bird species in Washington State, except for introduced birds such as the European starling, rock doves (pigeons) and English house sparrows, are protected under the MBTA. **Table 3-6** provides a list of MBTA-protected species observed at SEA during annual wildlife hazard surveys conducted by the Port. The Port has documented bald eagle occurrences within the GSA. There are no known bald eagle nests or roosting sites within the GSA. The golden eagle is rare west of the Cascades and has not been observed in the GSA.

TABLE 3-6: MBTA-PROTECTED BIRD SPECIES WITHIN THE GSA

Species		
American bittern	Common goldeneye	Greater scaup
American coot	Common merganser	Greater white-fronted goose
American crow	Common nighthawk	Greater yellowlegs
American goldfinch	Common raven	Green heron
American kestrel	Common yellowthroat	Green-winged teal
American pipet	Cooper's hawk	Hammond's flycatcher
American robin	Dark-eyed junco	Hairy woodpecker
American tree sparrow	Dickcissel	Hermit thrush
American wigeon	Double-crested cormorant	Herring gull
Anna's hummingbird	Dowitcher	Hooded merganser
Bald eagle	Downy woodpecker	Horned grebe
Band-tailed pigeon	Dunlin	Horned lark
Bank swallow	Earred grebe	House finch
Barn owl	Evening grosbeak	House wren
Barn swallow	Fox sparrow	Killdeer

TABLE 3-6: MBTA-PROTECTED BIRD SPECIES WITHIN THE GSA (CONTINUED)

Species		
Barred owl	Gadwall	Lazuli bunting
Barrow's goldeneye	Glaucous-winged gull	Least sandpiper
Belted kingfisher	Golden-crowned kinglet	Lesser nighthawk
Bewick's wren	Golden-crowned sparrow	Lesser scaup
Black swift	Gray-cheeked thrush	Lincoln's sparrow
Black-capped chickadee	Great blue heron	Long-eared owl
Black-headed grosbeak	Great horned owl	MacGillivray's warbler
Black-throated gray warbler	Greater scaup	Mallard
Blue-winged teal	Greater white-fronted goose	Marsh wren
Broad-winged hawk	Greater yellowlegs	Merlin
Brown creeper	Green heron	Mountain bluebird
Brown-headed cowbird	Green-winged teal	Mourning dove
Bufflehead	Hammond's flycatcher	Northern flicker
Bushtit	Hairy woodpecker	Northern harrier
Cackling goose	Hermit thrush	Northern pintail
California gull	Herring gull	Northern shoveler
California quail	Hooded merganser	Northern shrike
Canada goose	Horned grebe	Northwestern crow
Canvasback	Herring gull	Orange-crowned warbler
Caspian tern	Hooded merganser	Osprey
Cedar waxwing	Horned grebe	Ovenbird
Chestnut-backed chickadee	Evening grosbeak	Pacific golden plover
Chipping sparrow	Fox sparrow	Pacific slope flycatcher
Cliff swallow	Gadwall	Palm warbler
Glaucous-winged gull	Red-breasted nuthatch	Pectoral sandpiper
Golden-crowned kinglet	Red-breasted sapsucker	Peregrine falcon
Golden-crowned sparrow	Red-necked grebe	Pied-billed grebe
Gray-cheeked thrush	Red-necked phalarope	Pileated woodpecker
Great blue heron	Red-shouldered hawk	Pine siskin
Great horned owl	Red-tailed hawk	Purple martin
Red-breasted merganser	Spotted sandpiper	Western tanager
Red-winged blackbird	Spotted towhee	Western wood pewee
Ring-billed gull	Swainson's hawk	Whimbrel
Ring-necked duck	Townsend's warbler	White-crowned sparrow
Rough-legged hawk	Tree swallow	White-throated sparrow
Ruby-crowned kinglet	Tundra swan	White-throated swift
Ruddy duck	Turkey vulture	Willow flycatcher
Rufous hummingbird	Varied thrush	Wilson's snipe
Savannah sparrow	Vaux swift	Wilson's warbler
Sharp-shinned hawk	Violet-green swallow	Winter wren
Short-eared owl	Warbling vireo	Wood duck
Snow bunting	Western grebe	Yellow-headed blackbird
Snow goose	Western gull	Yellow-rumped warbler
Snowy owl	Western meadowlark	Yellow warbler
Song sparrow	Western sandpiper	Western screech owl
Sora		

Source: Port annual surveys (2019 to present).

State Species of Concern

The Washington Threatened, Endangered, and Sensitive Species list includes species listed under the federal ESA, and state listed endangered, threatened or sensitive species. No state listed or sensitive species are likely or known to occur in the GSA and therefore will not be discussed further in the EA. The Washington State Department of Natural Resources Natural Heritage Program has identified two different kinds of natural areas with the goal to conserve and restore rare plant and animal species. These include Natural Area Preserves (NAPs) and Natural Resource Conservation Areas (NRCAs). No NAPs or NRCAs are located within the GSA and therefore will not be discussed further in the EA.

3.3.3 Greenhouse Gas Emissions[21]

Greenhouse Gases (GHGs) are gases that trap heat in the earth's atmosphere. GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), hydrofluorocarbons (HFC), and perfluorocarbons. GHG emissions associated with aviation are principally in the form of CO_2 and are generated from the combustion of fossil fuels and are emitted as by-products contained in engine exhausts. Other GHGs associated with Airport operations (minor emissions compared to CO_2) include CH_4, N_2O, water vapor (H_2O), soot, and sulfates. Details of the analysis are provided in **Appendix C**.

3.3.3.1 Regulatory Setting

TABLE 3-7: STATUTES, REGULATIONS, AND EXECUTIVE ORDERS RELATED TO GHG

Statute	U.S. Code Implementing Regulation	Oversight Agency	Summary
Clean Air Act	42 U.S.C. §§ 7408, 7521, 7571, 7661 et seq. 40 CFR parts 85, 86, and 600 for surface vehicles part 60 for stationary power generation sources	USEPA	Regulates GHG emissions from on-road surface transportation vehicles and stationary power generation sources.

3.3.3.2 Existing Conditions

The GHG analysis completed for this EA considered GHG emissions inventories from three groups, Scope 1, 2, and 3 emissions. Scope 1 includes GHG emissions from sources owned or controlled by the Port at SEA, including Port-owned airfield vehicles, equipment, and stationary sources such as natural gas boilers and diesel generators. Scope 2 GHG emissions are those associated with the off-Airport generation of electricity purchased by the Port and consumed at SEA. Scope 3 includes GHG emissions caused by Airport operations that are not under the direct control of the Port, including sources like aircraft and motor vehicle emissions.

[21] After the publication of the Draft EA, EO 13990, which was relied upon for the January 2023 CEQ draft GHG guidance, was revoked. In addition, CEQ revoked its regulations (40 CFR parts 1500-1508) implementing NEPA, 42 U.S.C. 4321 *et seq*., as amended, in response to EO 14154. As a result of these changes, references to climate and the qualitative climate evaluation that discussed the level of preparedness with respect to the impacts of climate change, the extent to which the alternatives could be affected by future climate conditions, and if the alternatives are consistent with national, state, and local climate goals has been removed from the Final EA.

Methodology

FAA guidance notes that if a project might increase criteria pollutants and / or fuel use, it could increase GHG emissions, warranting a GHG emissions inventory. The GHG emissions inventories were conducted in accordance with FAA guidelines[22] and are described in more detail in **Appendix C**. The approach was developed in coordination with the FAA and the PSCAA.

Existing Condition GHG Emissions Inventory

A GHG emissions inventory was conducted to provide the estimate of the annual rate (metric tons (MT) per year) of emissions attributable to Airport sources for the Existing Condition (**Table 3-8**). Of the six primary GHGs, only CO_2, CH_4 and N_2O are potentially emitted directly or indirectly because of the Proposed Action and are included in this analysis.[23]

GHGs differ from each other in their ability to absorb energy and how long they stay in the atmosphere. The Global Warming Potential (GWP) was developed to allow comparisons of the global warming impacts of different gases by converting each gas amount to a carbon dioxide equivalent (CO_2e). GWPs provide a common unit of measure, which allows for one emission estimate of these different gases. GWPs based on a 100-year period (GWP 100) provided in the FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1* and based on the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report are used in this evaluation.[24]

[22] FAA Order 1050.1F, Environmental Impacts: Policies and Procedures (including the Desk Reference); FAA Order 5050.4B, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions; and FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1*.

[23] The other primary GHGs are fluorinated gases. Per USEPA, fluorinated gases are generally emitted as refrigerants and through industrial processes such as aluminum and semiconductor manufacturing. The other GHGs are not included because the Proposed Action does not include a potentially significant source of these GHGs. Additional information from the USEPA on fluorinated gases can be found at https://www.epa.gov/ghgemissions/overview-greenhouse-gases.

[24] There are also 20-year GWP values which prioritize gases with shorter lifetimes. For example, the GWP 20 value for methane is 86, according to IPCC, as compared to the GWP 100 value of 34. There is no difference between GWP 100 and GWP 20 for CO_2 and only a minor difference for nitrous oxides (GWP 100 is 298 and GWP 20 is 268). It is acknowledged that GHG emissions, especially for methane, would be higher using the GWP 20 instead of the GWP 100. However, methane emissions represent a small fraction of the total GHG emissions at SEA, as shown in Appendix C. This analysis used FAA guidance specifically provided in the FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1* to determine potential GHG emissions.

TABLE 3-8: GHG EMISSIONS INVENTORY SUMMARY – EXISTING CONDITION

Emissions Source	Annual Emissions (CO_2e MT per year)
Scope 1	
Port-Owned Airfield Vehicles / Equipment	3,722
Natural Gas Boilers	16,844
Diesel Generators	281
Fuel Farm Tanks[1]	0
Total - Scope 1	20,846
Scope 2	
Port of Seattle Electricity Consumption	2,399
Total – Scope 2	2,399
Scope 3	
Aircraft (fuel dispensed)[2]	5,707,018
Tenant-Owned GSE	27,895
Tenant Electricity Consumption	330
Airside Deliveries	523
Roadways	395,406
Parking Facilities	6,623
Total - Scope 3	6,137,795
Total	6,161,040

[1] CO_2, CH_4, and N_2O, are by-products of fuel combustion. Per the FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1*, the storage of fuel is a potential source of evaporative hydrocarbons but does not produce the type of hydrocarbons that contribute directly to global climate change.

[2] Based on FAA guidance, the estimated GHG emissions for aircraft operations, APUs, and aircraft engine ground run-ups were developed using the approximate fuel dispensed at the Airport.

Note: Totals may not sum due to rounding. Zeros may not indicate an absolute zero value.
Source: Port of Seattle, L&B, 2024.

3.3.4 Coastal Resources

Coastal resources include all natural resources occurring within coastal waters and their adjacent shorelands. Coastal resources include islands, transitional and intertidal areas, salt marshes, wetlands, floodplains, estuaries, beaches, dunes, barrier islands, and coral reefs, as well as fish and wildlife and their respective habitats within the coastlines of the Atlantic and Pacific oceans, the Great Lakes, and the Gulf of Mexico.

3.3.4.1 Regulatory Setting

TABLE 3-9: STATUTES, REGULATIONS, AND EXECUTIVE ORDERS RELATED TO THE PROTECTION OF COASTAL RESOURCES

Statute	U.S. Code Implementing Regulation	Oversight Agency	Summary
Coastal Barrier Resources Act	16 U.S.C. § 3501 et seq. U.S. DOI Coastal Barrier Act Advisory Guidelines, 57 Federal Register 52730 (November 5, 1992)	USFWS; FEMA	Prohibits, with some exceptions, federal financial assistance for development within the Coastal Barrier Resources System (CBRS) that contains undeveloped coastal barriers along the Atlantic and Gulf coasts and Great Lakes.
Coastal Zone Management Act (CZMA)	16 U.S.C. §§ 1451-1466 15 CFR part 930, subparts C and D 15 CFR part 923	NOAA; Appropriate State Agency	Provides for management of the nation’s coastal resources, including the Great Lakes.

Notes: DOI = U.S. Department of the Interior; FEMA = Federal Emergency Management Agency.

3.3.4.2 Existing Conditions

SEA is not located within the CBRS and there are no coral reefs within the project area. The CZMA applies to states having an approved Coastal Zone Management (CZM) plan. Proposed federal actions within the CZM boundary must work to achieve consistency with the applicable CZM plan. The WSDE administers Washington's CZM Program (CZMP). SEA is located within the CZM boundary.

3.3.5 Department of Transportation Act, Section 4(f) and Section 6(f)

Section 4(f) properties include parks and recreational areas of national, state, or local significance that are both publicly-owned and open to the public; publicly-owned wildlife and waterfowl refuges of national, state, or local significance that are open to the public; and historic sites of national, state, or local significance in public or private ownership regardless of whether they are open to the public. Section 4(f) protects historic or archaeological properties that are listed, or eligible for inclusion, on the National Register of Historic Places (NRHP), except in unusual circumstances.

3.3.5.1 Regulatory Setting

TABLE 3-10: STATUTES AND REGULATIONS RELATED TO SECTION 4(F) PROPERTIES

Statute	U.S. Code Implementing Regulation	Oversight Agency	Summary
Land and Water Conservation Fund (LWCF) Act of 1965	16 U.S.C. §§ 4601-4 et seq. 36 CFR part 59 et seq.	DOI	Section 6(f) provides funds for buying or developing public use recreational lands through grants to local and state governments. Section 6(f)(3) prevents conversion of lands purchased or developed with LWCF Act funds to non-recreation uses, unless the Secretary of the DOI, through the NPS, approves the conversion.
U.S. Department of Transportation Act – Section 4(f)	49 U.S.C. § 303 23 CFR part 774 et seq.	USDOT	Protects certain properties from use unless the relevant USDOT agency (e.g., the FAA) determines there is no feasible and prudent alternative and a project includes all possible planning to minimize harm.
Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA–LU) – Section 6009	49 U.S.C. § 303 23 CFR part 774 et seq.	USDOT	Amended Section 4(f) to simplify the process and approval of projects that have de minimis impacts on 4(f) properties.

Note: USDOT = U.S. Department of Transportation; NPS = National Park Service.

3.3.5.2 Existing Conditions

The identification of Section 4(f) resources focused on areas where Section 4(f) resources could be physically impacted (physical use) or where noise would substantially affect the use of a 4(f) resource (constructive use) within the GSA. The Section 4(f) resources within the GSA are depicted on **Exhibit 3-4**. Potential Section 4(f) resources include publicly-owned parks and recreation areas. There are no historic resources or wildlife refuges in the GSA. No Section 6(f) funded properties are located within the GSA; therefore, no Section 6(f) properties would be affected.[25] No further discussion of Section 6(f) will be included in this EA.

[25] Trust for Public Land, Past Projects website: https://lwcf.tplgis.org/mappast/, accessed July 12, 2023.

Public Parks and Recreation Areas

Under Section 4(f), public parks and recreation areas include properties that are publicly-owned (by any local, state, or federal agency), open and available to the public, and used primarily for the purpose of park or recreational activities. Public parks and recreation areas located within the GSA are listed in **Table 3-11** and shown on **Exhibit 3-4**.

TABLE 3-11: PARKS AND RECREATION AREA LOCATED WITHIN THE GSA

Map ID	Name	Owner
P-1	Des Moines Memorial Park	City of Burien
P-2	Miller Creek Trail	City of Burien
P-3	Moshier Memorial Park	City of Burien
P-4	Walker Creek Wetland	City of Burien
P-5	Angle Lake Park	City of SeaTac
P-6	Des Moines Creek Park - SeaTac	City of SeaTac
P-7	North SeaTac Park[1]	Port of Seattle
P-8	Riverton Heights Park	City of SeaTac
P-9	S. 156th Way Trail	City of SeaTac
P-10	Leased Port of Seattle Property (Rugby)	Port of Seattle
P-11	S. 200th Street Shared Use Path	City of SeaTac
P-12	Westside Trail	City of SeaTac
P-13	Lake to Sound Trail	King County Parks and Recreation
P-14	Leased Port of Seattle Property (Sunset Playfield)	King County Parks and Recreation
P-15	Leased Port of Seattle Property (Ball Fields)	Port of Seattle

[1] North SeaTac Park extends onto Port-owned property under an existing lease agreement that provides for its use as a park until January 21, 2045.
Source: King County GIS data, City of Burien, Port of Seattle.

3.3.6 Farmlands

Farmlands are defined as those agricultural areas considered important and protected by federal, state, and local regulations. Important farmlands include all pasturelands, croplands, and forests considered to be prime, unique, or of statewide or local importance. The Proposed Action and alternatives would occur entirely on Port-owned land that is currently zoned for airport purposes. No farmlands are present within the GSA and therefore no further discussion of farmlands will be included.

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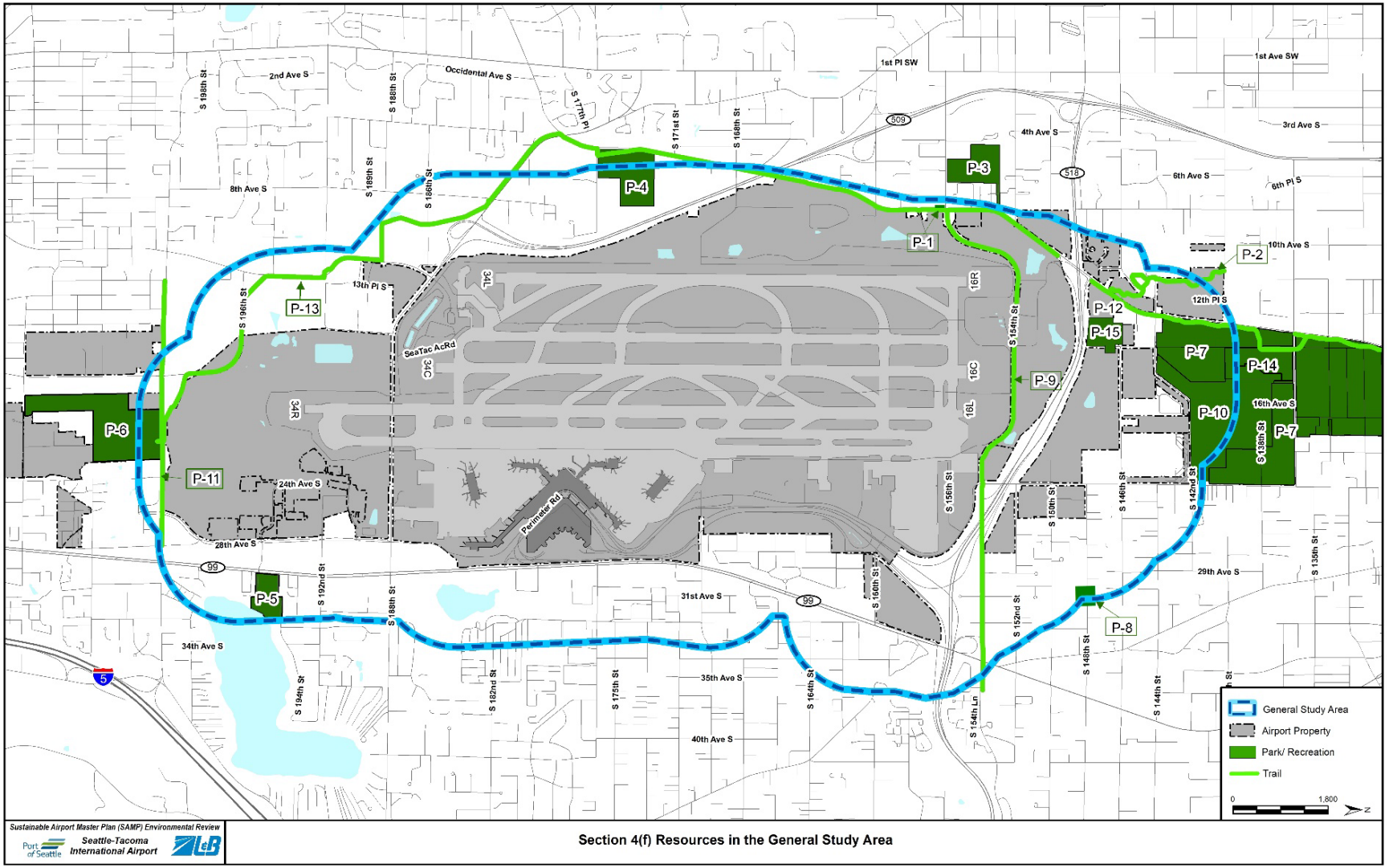
EXHIBIT 3-4: SECTION 4(F) RESOURCES IN THE GSA



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3.3.7 Hazardous Materials, Solid Waste, and Pollution Prevention

Hazardous materials are any substance or material that has been determined to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce. The term hazardous materials includes both hazardous wastes and hazardous substances, as well as petroleum and natural gas substances and materials. Solid waste is defined by the implementing regulations of the Resource Conservation and Recovery Act (RCRA) generally as any discarded material that meets specific regulatory requirements and can include such items as refuse and scrap metal, spent materials, chemical by-products, and sludge from industrial and municipal wastewater and water treatment plants. Pollution prevention describes methods used to avoid, prevent, or reduce pollutant discharges or emissions. **Appendix F**, **Hazardous Materials and Solid Waste** contains additional information on the regulatory setting, surveys completed, recycling, and pollution prevention.

3.3.7.1 Regulatory Setting

TABLE 3-12: STATUTES, REGULATIONS, EXECUTIVE ORDERS, AND OTHER REQUIREMENTS RELATED TO HAZARDOUS MATERIALS, SOLID WASTE, AND POLLUTION PREVENTION

Statute	U.S. Code Implementing Regulation	Oversight Agency	Summary
Resource Conservation and Recovery Act (RCRA)	42 U.S.C. §§ 6901-6992k 40 CFR parts 240-299	USEPA	Establishes guidelines for hazardous waste and non-hazardous solid waste management activities in the U.S. Regulates the generation, storage, treatment, and disposal of waste.
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)(as amended by the Superfund Amendments Reauthorization Act of 1986 and the Community Environmental Response Facilitation Act of 1992)	42 U.S.C. §§ 9601-9675 40 CFR parts 300, 311, 355, 370, and 373	USEPA	Establishes joint and several liability for those parties responsible for hazardous substance releases to pay cleanup costs and establishes a trust fund to finance cleanup costs in situations in which no responsible party could be identified. Enables the creation of the NPL, a list of sites with known releases or threatened releases of hazardous substances in the U.S. and its territories used to guide the USEPA in determining which sites warrant further investigation.
Pollution Prevention Act	42 U.S.C. §§ 13101-13109	USEPA	Requires pollution prevention and source reduction control so that wastes would have less effect on the environment while in use and after disposal.

Note: NPL = National Priorities List.

3.3.7.2 Existing Conditions

The known hazardous material sites are depicted on **Exhibit 3-5**.

Hazardous Materials

Current activities at SEA that generate or involve the use of hazardous materials include aircraft fueling; maintenance of aircraft, GSE, motor vehicles, buildings, and Airport grounds; various Port maintenance shop operations; and construction activities. Many tenants use hazardous materials and generate hazardous waste. These wastes are disposed of by the tenants, and the Port does not take ownership of tenants' hazardous waste. SEA is considered a federal Small Quantity Generator by the USEPA and a State of Washington Medium Quantity Generator, generating 19,891 pounds of hazardous waste in 2022.[26]

Based on a review of the WSDE's *What's in My Neighborhood* mapping tool, there have been 58 documented incidents of contamination within the GSA requiring further action. These sites are listed in **Table 3-13** (Sites H-1 through H-58) and depicted on **Exhibit 3-5**. Twenty-two of these incidents occurred on SEA property. SEA property sites are indicated in **bold** text in the table. The Port is not responsible for the sites that are not located on SEA property.

SEA also has potential for other contaminants such as per- and polyfluoroalkyl substances (PFAS). PFAS are in several materials used by industry and consumers and include perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS), among more than 7,800 chemicals. At the Airport, these substances are primarily found in aqueous film-forming foam (AFFF), a Class B firefighting foam used to fight aviation and other chemical fires.

A review of the Port's records indicates a total of 16 areas where AFFF has been deployed for an incident, used for training purposes, stored, or identified in water sampling (see **Exhibit 3-5** and **Table 3-13**; Sites H-59 through H-75).

The NPL is the list of sites of national priority among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. The NPL is intended primarily to guide the USEPA in determining which sites warrant further investigation. No NPL-listed sites are located within the GSA.

[26] Data provided by the Port, February 27, 2023.

EXHIBIT 3-5: AREAS OF KNOWN CONTAMINATION

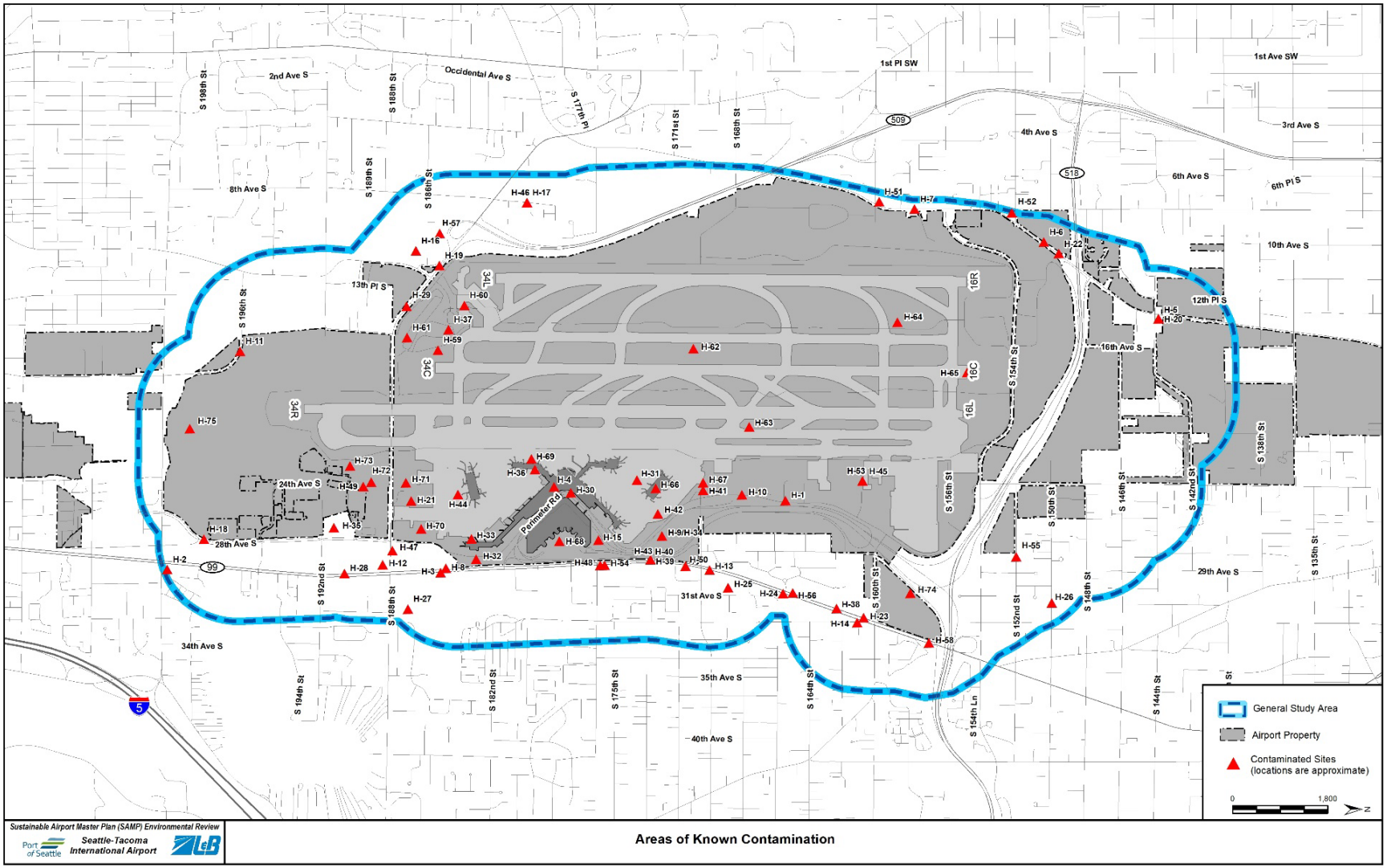

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TABLE 3-13: DOCUMENTED INCIDENTS OF HAZARDOUS MATERIALS CONTAMINATION

Map ID	Name	Address / Location	Site Status	Cleanup Type
H-1	**Airborne Express**	**2580 S. 166th Street, Seattle, Washington, 98158**	**Cleanup Started**	**Independent Action**
H-2	British Petroleum (BP) 11255	19924 International Blvd, Seattle, Washington, 98188	Cleanup Started	Independent Action
H-3	Budget Rent a Car of WA & OR Pacific HWY	18445 International Blvd, Seattle, Washington, 98188	Cleanup Started	Independent Action
H-4	**Budget Rent a Car of WA / OR**	**17801 International Blvd, Seattle, Washington, 98158**	**Cleanup Started**	**Independent Action**
H-5	Burien Fuel	14260 Des Moines Memorial Drive S., Seattle, Washington, 98168	Cleanup Started	Independent Action
H-6	Charley's Shell	15041 Des Moines Memorial Drive S., Seattle, Washington, 98148	Cleanup Started	Independent Action
H-7	Chevron Crombies	15804 Des Moines Memorial Drive S., Seattle, Washington, 98148	Cleanup Started	Independent Action
H-8	Chevron Station 92259	18514 Pacific Hwy S., Seattle, Washington, 98188	Cleanup Started	Independent Action
H-9	**Continental Olympic United Fuel Farm**	**Air Cargo Rd, Seattle, Washington, 98158**	**Cleanup Completed under Participation Agreement conditions**	**Independent Action**
H-10	**Delta Air Lines Seattle**	**16745 Air Cargo Rd, Seattle, Washington, 98158**	**Cleanup Started**	**Independent Action**
H-11	Des Moines Creek Regional Detention Facility	S. 196th St & 18th Ave S., Seattle, Washington, 98148	Cleanup Started	Independent Action
H-12	Exxon 73287	2841 S. 188th Street, Seattle, Washington, 98188	Cleanup Started	PLIA Petroleum Technical Assistance Program
H-13	Exxon 79047	16850 International Blvd, Seattle, Washington, 98188	Cleanup Started	Independent Action
H-14	Gordon Tang Co Inc	16020 32nd Avenue S., Seattle, Washington, 98188	Cleanup Started	Independent Action
H-15	**Hertz Avis National Fuel Facility QTA**	**SEA**	**Cleanup Started**	**Independent Action**
H-16	Hertz Corp	18625 Des Moines Memorial Drive S., Seattle, Washington, 98148	Cleanup Started	Independent Action
H-17	Highline SD Maintenance Yard	17910 8th Avenue S., Seattle, Washington, 98148	Cleanup Started	Independent Action
H-18	Highline Water District	19863 28th Avenue S., Seattle, Washington, 98188	Cleanup Started	Independent Action
H-19	Jim's Detail Shop	98148-1919, Seattle, Washington	Cleanup Started	Independent Action

TABLE 3-13: DOCUMENTED INCIDENTS OF HAZARDOUS MATERIALS CONTAMINATION (CONTINUED)

Map ID	Name	Address / Location	Site Status	Cleanup Type
H-20	Joe's Inc.	14260 Des Moines Memorial Drive S., Seattle, Washington, 98168	Cleanup Started	Independent Action
H-21	**Lockheed Air Terminal**	**SEA**	**Cleanup Started**	**Independent Action**
H-22	**Lora Lake Apartments**	**15001 Des Moines Memorial Drive S., Seattle, Washington, 98148**	**Cleanup Completed. Port is currently monitoring**	**WSDE-supervised or conducted**
H-23	Loudon Real Estate	16015 International Blvd, Seattle, Washington, 98188	Awaiting Cleanup	Independent Action
H-24	M & M Finishers Inc	16600 Pacific Hwy S., Seattle, Washington, 98188	Cleanup Started	Voluntary Cleanup Program
H-25	Master Park	16826 International Blvd, Seattle, Washington, 98188	Awaiting Cleanup	No Process
H-26	Minchew Property	3025 S.150th Street, Seattle, Washington, 98188	Awaiting Cleanup	Independent Action
H-27	Red Lion Hotel SeaTac	18740 International Blvd, Seattle, Washington, 98188	Cleanup Started	Independent Action
H-28	Retail Building	19023 Pacific Hwy S., Seattle, Washington, 98188	Cleanup Started	Independent Action
H-29	SAFCO Environmental Corp	1255 S.188th Street, Seattle, Washington, 98148	Cleanup Started	Independent Action
H-30	**SEA**	**SEA**	**Cleanup Started**	**WSDE-supervised or conducted**
H-31	**SEA NW Baggage Tunnel**	**SEA**	**Cleanup Started**	**Independent Action**
H-32	**SEA NW Fuel Farm**	**SEA**	**Awaiting Cleanup**	**Independent Action**
H-33	**SEA Pan Am Fuel Farm**	**SEA**	**Cleanup Started**	**Independent Action**
H-34	**SEA United Fuel Farm**	**SEA**	**N/A. See H-9**	**N/A. See H-9**
H-35	Sea-Tac Alaska Airlines BLDG-1995	2651 S.192nd Street, Seattle, Washington, 98188	Cleanup Started	Independent Action
H-36	**SEA Concourse B Gate B2**	**SEA**	**Cleanup Started**	**Independent Action**
H-37	**Sea-Tac Crawford Aviation**	**SEA**	**Cleanup Started**	**Independent Action**
H-38	SeaTac Development	16025 International Blvd, Seattle, Washington, 98188	Cleanup Started	WSDE-supervised or conducted
H-39	**SEA Pan Am Hangar**	**17205 Pacific Hwy S., Seattle, Washington, 98188**	**Cleanup Started**	**Independent Action**
H-40	**SEA Pan Am Tanks 10A-10D**	**17205 Pacific Hwy S., Seattle, Washington, 98188**	**Cleanup Started**	**Independent Action**
H-41	**SEA NW Air Bulk Fuel**	**SEA**	**Cleanup Started**	**Independent Action**

TABLE 3-13: DOCUMENTED INCIDENTS OF HAZARDOUS MATERIALS CONTAMINATION (CONTINUED)

Map ID	Name	Address / Location	Site Status	Cleanup Type
H-42	**SEA NW Airlines Front Hangar**	**SEA**	**Cleanup Started**	**Independent Action**
H-43	SEA Pan Am Av Gas Tanks	17205 Pacific Hwy S., Seattle, Washington, 98188	Cleanup Started	Independent Action
H-44	**SEA South Satellite / NW Air**	**SEA**	**Cleanup Started**	**Independent Action**
H-45	**SEA United Tank Removal**	**2230 S.161st Street, Seattle, Washington, 98158**	**Cleanup Started**	**Independent Action**
H-46	Seattle School Highline Maintenance	17910 8th Avenue S., Seattle, Washington, 98148	Cleanup Started	Independent Action
H-47	Shell at Sea-Tac	2806 S.188th Street, Seattle, Washington, 98188	Cleanup Started	Independent Action
H-48	Sound Transit Parcel A1 109	17600 International Blvd, Seattle, Washington, 98188	Cleanup Started	Independent Action
H-49	**Swissport Fueling**	**2350 S. 190th Street, Seattle, Washington, 98188**	**Cleanup Started**	**Independent Action**
H-50	Tac Sea Motel	17024 Pacific Hwy S., Seattle, Washington, 98188	Cleanup Complete -O&M / Monitoring	WSDE-supervised or conducted
H-51	Willie's Texaco	15939 Des Moines Memorial Drive S., Seattle, Washington, 98148	Awaiting Cleanup	Independent Action
H-52	Tucker Upholstery	15217 Des Moines Memorial Drive S., Seattle, Washington, 98148	Cleanup Started	PLIA Petroleum Technical Assistance Program
H-53	**United Airlines Sea-Tac Intl Airport**	**2230 S. 161st Street, Seattle, Washington, 98158**	**Closed under VCP**	**N/A**
H-54	UNOCAL 4871	17606 International Blvd, Seattle, Washington, 98188	Cleanup Started	Independent Action
H-55	Victoria Town Homes	2805 S.152nd Street, Seattle, Washington, 98188	Cleanup Started	Voluntary Cleanup Program
H-56	Washington Memorial Park	16445 Pacific Hwy S., Seattle, Washington, 98188	Cleanup Started	Independent Action
H-57	Washington Department of Transportation Foreman A1 Towing	SR509 and 18451 12th Avenue S.	Cleanup Started	Independent Action
H-58	WSP Tukwila	15666 Pacific Hwy S., Seattle, Washington, 98188	Cleanup Started	Independent Action
H-59	**AFFF Testing and Training Location**	**Southern portion of Airfield, between Runway 34L and Runway 34 C**	**N/A**	**N/A**
H-60	**AFFF Testing and Training Location**	**Southern portion of Airfield, between Runway 34L and Runway 34C**	**N/A**	**N/A**

TABLE 3-13: DOCUMENTED INCIDENTS OF HAZARDOUS MATERIALS CONTAMINATION (CONTINUED)

Map ID	Name	Address / Location	Site Status	Cleanup Type
H-61	**Annual (Summer) Testing / Training**	**Southern portion of Airfield, near industrial wastewater system (IWS) Lagoon 1**	**N/A**	**N/A**
H-62	**Small Aircraft Fire / AFFF Release**	**Central Airfield near Taxiway T**	**N/A**	**N/A**
H-63	**Aircraft Engine Fire / AFFF Release**	**Central Airfield on Taxiway B**	**N/A**	**N/A**
H-64	**Cargo Aircraft Crash/AFFF Release**	**Intersection of Taxiway E and Taxiway T**	**N/A**	**N/A**
H-65	**Grass Fire / AFFF Release**	**Northern portion of Airfield near end of Runway 16C**	**N/A**	**N/A**
H-66	**North Satellite Terminal AFFF Storage**	**North Satellite Terminal**	**N/A**	**N/A**
H-67	**ARFF Station AFFF Storage and Testing / Training**	**ARFF Station**	**N/A**	**N/A**
H-68	**Small Plane Crash/AFFF Release**	**Near Main Terminal Parking Garage**	**N/A**	**N/A**
H-69	**B-Terminal Airplane Crash / AFFF Release**	**Main Terminal, Concourse B**	**N/A**	**N/A**
H-70	**AFFF in Hangar Fire Suppression System**	**Delta Airlines Hangar**	**N/A**	**N/A**
H-71	**AFFF in Hangar Fire Suppression System**	**Alaska Airlines Hangar**	**N/A**	**N/A**
H-72	**AFFF Accidental Release**	**Airport Fuel Farm**	**N/A**	**N/A**
H-73	**AFFF Storage for Fuel Farm**	**Airport Fuel Farm**	**N/A**	**N/A**
H-74	**AFFF in QTA Fire Suppression System**	**Rental Car Facility**	**N/A**	**N/A**
H-75*	**Tyee Well**	**2152 S. 200th Street**	**PFAS detected at levels exceeding State Action Level**	**Well removed from service**

N/A: Information is not available or not applicable.
Independent actions: contamination cleanup is done independently without a legal agreement.
WSDE-supervised cleanup: contamination cleanup is done under an agreed order of consent decree.
Voluntary Cleanup Program (VCP): under the VCP, people who independently cleanup a contaminated site may request fee-based services from the WSDE, including technical assistance and written opinions on whether requirements have been met.
No Process: Sites not under WSDE or federal oversight, not enrolled in the VCP, and where no independent action has been taken.
PLIA Petroleum Technical Assistance Program: this state program provides qualifying petroleum sites with consultation and opinion under the authority of Chapter 70A.330 RCW and the Model Toxics Control Act (MTCA), Chapter 70A.305 RCW and Chapter 173-340 WAC.
* https://doh.wa.gov/data-and-statistical-reports/washington-tracking-network-wtn/pfas/dashboard, accessed February 11, 2024.
Note: **Bold** font = site is located on SEA property.
Source: Washington Department of Ecology, What's in My Neighborhood Tool.
https://apps.ecology.wa.gov/neighborhood/, accessed February 2023. WSDE data was supplemented with current Port of Seattle data where applicable.

Solid Waste

SEA uses a centralized waste collection system divided between terminal and support areas and airfield areas. The collection and disposal of solid waste at SEA in 2022 is summarized in **Table 3-14**. Municipal Solid Wastes (MSW or garbage) collected in publicly and non-publicly accessible terminal and support areas are transported to central collection sites on SEA, where MSW vendors who are under contract with the Port collect them for offsite disposal. Flight kitchens, some cargo operators, and airline maintenance hangars manage their waste separately from the Airport system.

Each centralized waste collection site has at minimum one compactor for comingled recyclables and one compactor for garbage. Additional containers for compostable material, used cooking oil, scrap metal, construction debris, and garbage are located at various terminal loading docks and remote collection sites. Multiple service providers haul garbage, recyclables, compostable waste, and other wastes from compactors, drop boxes, and dumpsters in the Port's central waste collection sites.

TABLE 3-14: SOLID WASTE SUMMARY (2022) IN TONNAGE

Material	Vendor	Fate	Destination	Terminal	Airfield
Garbage (MSW)	Recology (contract held by City of SeaTac)	Landfilled	Cedar Hills Regional Landfill (CHRL)[1]	4,291	2,525
Mixed Recycling	Recology	Recycled	Recology Materials Recovery Facility – South Seattle, WA	2,097	129
Food + Compostables	Cedar Grove Composting	Composted	Cedar Grove compost facility in Maple Valley, WA	1,070	N/A
Used Cooking Oil	Mahoney Environmental	Converted to Biodiesel	Mahoney Biodiesel Facility in Seattle	43	N/A
Glass	Recology	Recycled	Recology Materials Recovery Facility – South Seattle, WA	20	N/A
Scrap Metal	Young's Salvage	Recycled	Various local metal recycling facilities	55	N/A
Plastic Film	Recology	Recycled / Landfilled	Recology Materials Recovery Facility – South Seattle, WA / CHRL	N/A	N/A
Donated Food	Des Moines Area Food Bank	Donated	Des Moines Area Food Bank and neighboring communities	16	N/A
Checkpoint/Terminal Liquids	Zone 1-3 Custodial Vendors	Diverted	Drained to Sanitary Sewer	158	N/A
Plastic Water Bottle Prevention	Estimated via liquid refill station use	Prevented	N/A	24	N/A
Other materials (lamps, ballasts, e-scrap, used oil & antifreeze, batteries, tires, paper reduction)	Various vendors	Recycled & Prevented	Various local recycling facilities	28	N/A
Construction Waste – In Terminal	Recology	Recycled	Various King County certified Construction Waste Recycling facilities	61	N/A
Biohazardous	Trilogy	Autoclaved, Landfilled	Covanta Waste to Energy in Brooks, OR; Autoclave / Landfill in California or Utah	1	N/A
Regulated Waste (International)	Stericycle	Autoclaved, Landfilled	Covanta WTE Brooks, OR	75	N/A

[1] In November 2022 the County identified a preferred alternative for landfill development. This development is estimated to increase Cedar Hills Regional Landfill life until early 2038. https://kingcounty.gov/en/dept/dnrp/waste-services/garbage-recycling-compost/solid-waste-facilities/cedar-hills-development, accessed February 11, 2024.
Source: Data provided by Port, 2023.

3.3.8 Historic, Architectural, Archaeological, and Cultural Resources

Historical, architectural, archaeological, and cultural resources encompass a range of sites, properties, and physical resources relating to human activities, society, and cultural institutions. Such resources include past and present expressions of human culture and history in the physical environment, such as prehistoric and historic archaeological sites, structures, objects, districts, which are considered important to a culture or community. **Appendix G, Historic Resources** contains additional information including surveys completed and correspondence.

3.3.8.1 Regulatory Setting

TABLE 3-15: STATUTES, REGULATIONS, EXECUTIVE ORDERS, AND OTHER REQUIREMENTS RELATED TO HISTORICAL, ARCHITECTURAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

Statute	U.S. Code Implementing Regulation	Oversight Agency	Summary
National Historic Preservation Act (NHPA)	54 U.S.C. § 300101 et seq. 36 CFR part 800 (Section 106 process); part 60 (NRHP); part 62.1 (National Natural Landmarks); part 65 (National Historic Landmarks); part 68 (standards); part 73 (World Heritage Program); part 78 (waiver of federal agency Section 110 responsibilities); part 79 (curation)	NPS; ACHP; SHPO; THPO	Establishes the ACHP, an independent agency, and the NRHP within the NPS. Section 106 of the NHPA requires federal agencies to consider the effects of their undertaking (or action) on properties listed in or eligible for listing in the NRHP. Within the State of Washington, the Washington Department of Archaeology and Historic Preservation (DAHP) administers the NRHP program under the direction of the SHPO.
Executive Order 13175, Consultation and Coordination with Indian Tribal Governments	65 Federal Register 67249 (November 9, 2000)	Not Applicable	Requires federal agencies to have an accountable tribal consultation process that ensures timely and meaningful input from Indian Tribes on the development of federal policies that have tribal implications. Directs executive departments and agencies to engage in government-to-government relations with Native American tribal governments in a knowledgeable, sensitive manner.

Notes: ACHP = Advisory Council on Historic Preservation; SHPO = State Historic Preservation Officer; THPO = Tribal Historic Preservation Officer.

3.3.8.2 Existing Conditions

The FAA identified the Area of Potential Effect (APE) and DAHP concurred. An APE is "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties" (36 CFR § 800.16(d)). The APE encompasses the areas where ground disturbing activities are anticipated to be located and for areas that may be affected by a change in visual character or setting (see **Exhibit 3-6**).

Definition of the Undertaking

An undertaking, as defined in 36 CFR 800.16(y), is a project funded in whole or in part under the jurisdiction of a federal agency. This includes projects carried out by or on behalf of a federal agency; those carried out with federal financial assistance; those requiring a federal permit, license or approval; and those subject to state or local regulation administered pursuant to a delegation or approval by a federal agency.

As explained in Chapter 1, Section 163 of the FAA Reauthorization Act of 2018 and Section 743 of the FAA Reauthorization Act of 2024 limited FAA's ALP approval authority and land use approval authority. While the Proposed Action details the Port's intended development at SEA, only some of these development components are subject to FAA's approval and / or funding. Therefore, the undertaking is slightly different from the Proposed Action. The undertaking does not include L04 – Main Terminal North GT Lot and S01 – Fuel Farm Expansion. The FAA determined it does not have approval authority for these two projects and they are not related to any of the projects that the FAA does have authority over. Therefore, these projects are not included as part of the undertaking.

Study Completed

Stell Environmental Enterprises, Inc (Stell) completed a cultural resource survey of the APE in February 2021. Stell documented four archaeological sites and 12 historic properties. None of the historic properties or archaeological sites were determined to be eligible for listing on the NRHP. Fieldwork Studio LLC (Fieldwork) completed a focused reconnaissance survey in December 2023. None of the properties documented were determined to be eligible for listing on the NRHP. Fieldwork also completed an evaluation of the Washington Memorial Park Cemetery in March 2024. The Cemetery was determined not eligible for listing on the NRHP.

EXHIBIT 3-6: AREA OF POTENTIAL EFFECT (APE)

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3.3.9 Land Use

Aviation-related land use planning is integral to safe, sustainable operations. Ensuring compatibility requires an analysis of how the Airport functions within the community and how the community can be impacted by the Airport.

3.3.9.1 Regulatory Setting

TABLE 3-16: STATUTES, REGULATIONS, AND EXECUTIVE ORDERS RELATED TO LAND USE

Statute	US Code Implementing Regulation	Oversight Agency	Summary
Airport and Airway Improvement Act of 1982, and subsequent amendments	49 U.S.C. § 47107(a)(10)	FAA	AIP funding for an airport development project may not be approved unless the Secretary of Transportation receives written assurance satisfactory to the Secretary that appropriate action, including the adoption of zoning laws, has been or will be taken, to the extent reasonable, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including the landing and take-off of aircraft.
Airport Improvement Program (AIP)	49 U.S.C. § 47106(a)(1)	FAA	AIP funding for an airport development project may not be approved unless the Secretary of Transportation is satisfied that a project is consistent with plans (existing at the time a project is approved) of public agencies for development of the area in which the airport is located.
Airport Safety, Protection of Environment, Criteria for Municipal Solid Waste Landfills	40 CFR § 258.10	USEPA	Addresses restrictions on municipal solid waste landfills relative to airports.

3.3.9.2 Existing Conditions

The land use analysis focused on the areas within the GSA where the Proposed Action or alternatives may create impacts that are incompatible with existing or future planned land uses. The analysis considered the City of SeaTac and those jurisdictions within the GSA (see **Exhibit 3-7**).

Existing Land Use

The predominant existing land use within the GSA is commercial / industrial. Land uses surrounding the Airport property include parkland, residential, industrial, and commercial.

Planned and Future Land Use

General land use within each jurisdiction is established through a comprehensive plan and applied through zoning regulations. Zoning provides an indication of possible future land use and does not always reflect the current land use. Zoning directly adjacent to Port-owned property is predominantly commercial along the east; park and residential to the north; mixed use to the south; and mixed commercial, industrial, and residential to the west (see **Exhibit 3-8**).

Title 36, Chapter 36.70.547 of the Revised Code of Washington[27] requires every county, city, and town in which a general aviation airport, that is operated for the benefit of the general public, is located to, through its comprehensive plan and development regulations, discourage the siting of incompatible uses adjacent to such general aviation airport. Thus, local plans and land use regulations have been developed by adjacent jurisdictions to discourage uses incompatible with Airport operations.

Local and county comprehensive plans, local redevelopment plans, regional transportation plans, and other agreements from the jurisdictions within the GSA were collected for this EA to understand planned and future land uses. These included the following:

- Port and City of SeaTac Interlocal Agreement (ILA) (2018)
- SeaTac Comprehensive Plan (last update: November 23, 2021)
- City of Des Moines Comprehensive Plan (June 25, 2015, amended: December 3, 2020)
- The Burien Plan (updated on November 7, 2022)
- Tukwila Comprehensive Plan (2015)
- Puget Sound Regional Council (PSRC) Vision 2050 (adopted in October 2020)

Information on each plan / agreement is provided in **Appendix H, Land Use**.

[27] https://app.leg.wa.gov/RCW/default.aspx?cite=36.70.547

EXHIBIT 3-7: LAND USE NEAR THE AIRPORT

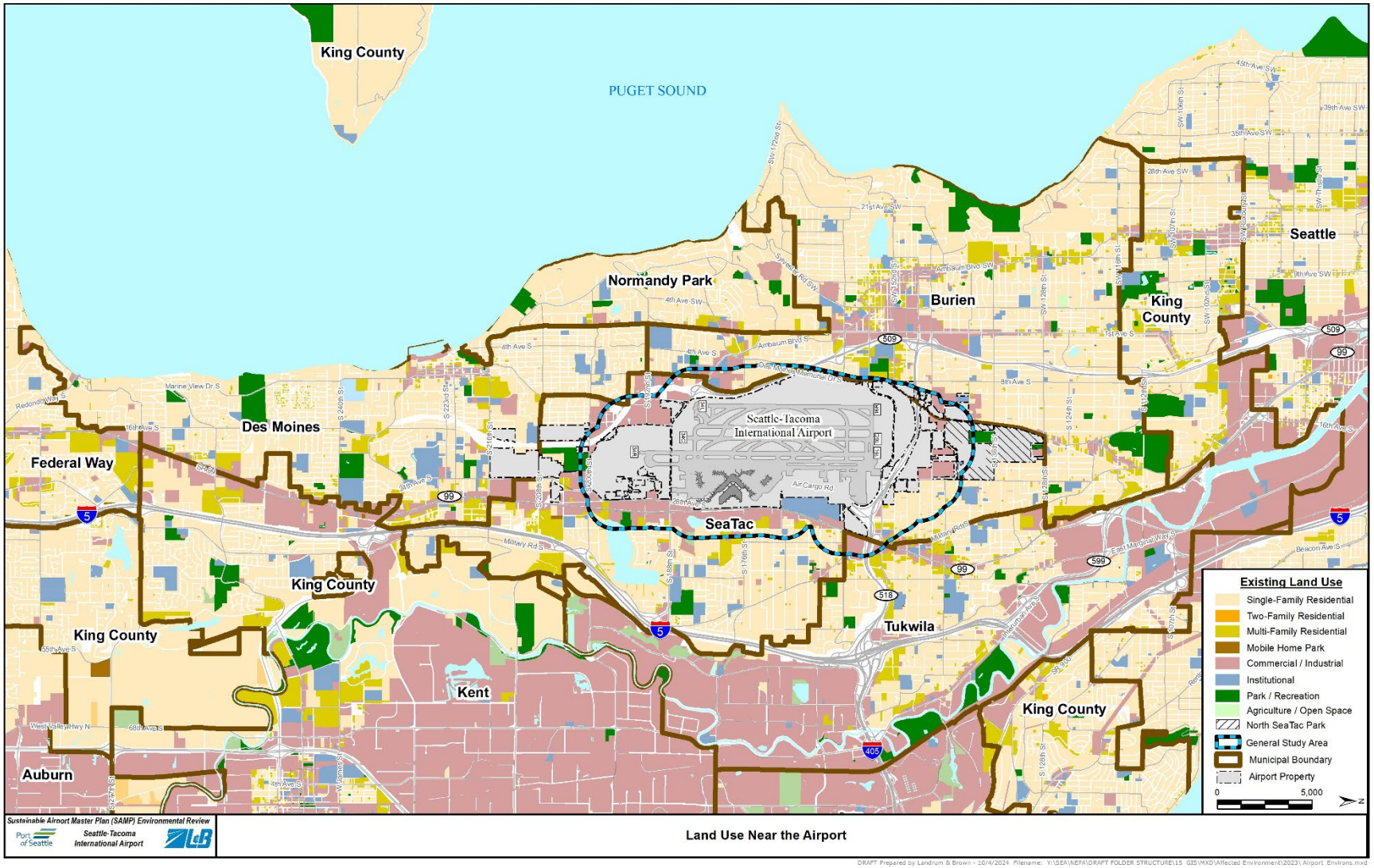

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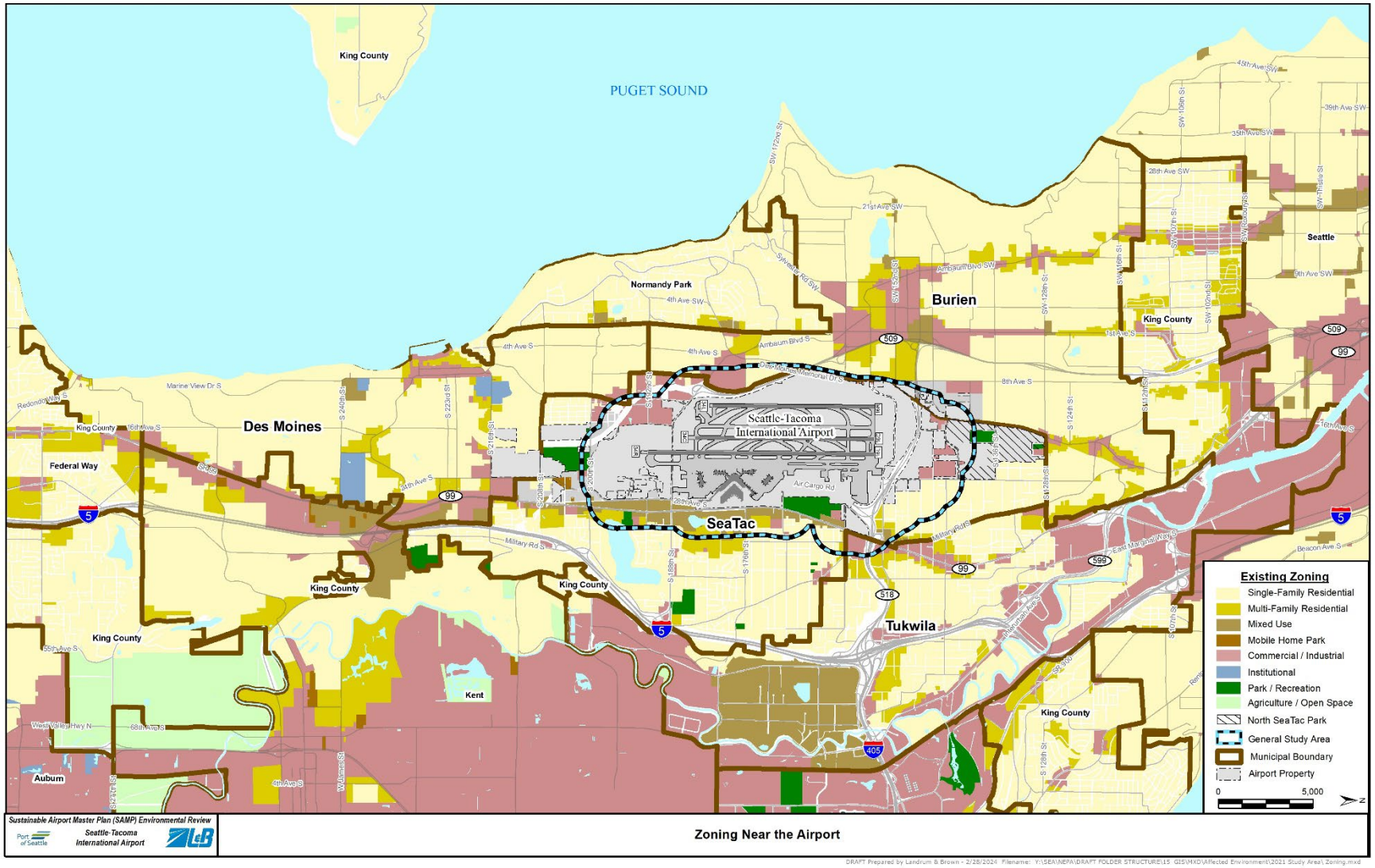
EXHIBIT 3-8: ZONING NEAR THE AIRPORT



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3.3.10 Natural Resources and Energy Supply

This impact category evaluates a project's consumption of natural resources (such as water, asphalt, aggregate, wood, etc.) and use of energy supplies (such as coal for electricity; natural gas for heating; and fuel for aircraft, or other ground vehicles) from construction, operation, and / or maintenance of the Proposed Action or alternative(s).

3.3.10.1 Regulatory Setting

There are no special purpose laws or requirements for natural resources or energy supply that apply to the NTPs.

3.3.10.2 Existing Conditions

The Seattle-Tacoma area is a well-developed urban area with adequate access to natural resources for facility operations, aircraft operations, and construction projects. Under normal operating circumstances, SEA has access to utilities and fuel, and these energy sources are currently not in short supply in the area.[28]

Electricity and Natural Gas

Energy demands from the operation of Airport facilities are met through the consumption of electricity, natural gas, and liquid fuels. The Bonneville Power Administration (BPA), Puget Sound Energy (PSE) and Seattle City Light (SCL) provide electricity, and PSE and Cost Management Services provide natural gas. Electricity is the primary source of energy used for lighting and cooling of the SEA facilities, including the terminal building. On the airfield, runway and taxiway lighting, aircraft ground power, and various navigational systems use electricity. BPA provides power and transmission services to SEA, which operates as the electric utility within the fence line of the Airport property. This accounts for over 90 percent of the electricity used at SEA. PSE and SCL serve smaller retail loads outside the Main Terminal, such as the bus maintenance facility, distribution center, cargo buildings, airfield lighting, and similar smaller uses.

Natural gas provides heat, steam, and hot water to the SEA facilities. The boilers in SEA's main heating plant use natural gas as the primary energy source, with diesel as a backup source when the natural gas supply is interrupted. The Port also uses natural gas to fuel certain vehicles used at SEA, including its Rental Car Facility and employee shuttle buses.

Table 3-17 and **Table 3-18** show the electricity and natural gas usage at SEA in selected years from 2010 to 2022.

TABLE 3-17: ELECTRICITY CONSUMPTION (MEGAWATT HOUR)

Year	Total BPA Electricity Consumption (non-tenant)	Tenant BPA Electricity Consumption	Total SCL Electricity Consumption	Total PSE Electricity Consumption
2010	114,000	31,000	1,600	700
2015	115,000	32,000	1,600	1,900
2019	118,000	28,000	2,100	2,300
2022	117,000	26,376	2,100	2,207

Note: Numbers are rounded to the nearest 100.
Source: Data provided by the Port of Seattle.

[28] United States Energy Information Administration, Washington State profile and energy estimates. www.eia.gov/state/analysis, accessed July 12, 2023.

TABLE 3-18: NATURAL GAS CONSUMPTION (THERMS)

Year	Total Central Plant Natural Gas Consumption	Total CNG Fueling Station Natural Gas Consumption	Total Other Buildings Natural Gas Consumption	Renewable Natural Gas (started 10/2020)
2010	2,700,000	0	115,000	0
2015	2,550,000	500,000	115,000	0
2019	2,500,000	560,000	200,000	0
2022	2,980,291	447,000	190,434	50% of the total natural gas is renewable; 100% of CNG in buses

Notes: Numbers are rounded to the nearest 100.
1 therm = a unit of heat equivalent to 100,000 British Thermal Units.
CNG – Compressed Natural Gas
Source: Data provided by the Port of Seattle.

Renewable Natural Gas (RNG)

The Port has a contract for RNG supply that began in October 2020 to replace approximately 60 percent of the existing fossil gas usage in the boilers and all of the supply at its CNG fueling station. RNG is a natural gas produced by the decomposition of organic matter. The term “renewable” is used to describe this gas because it is derived from waste that is continuously produced by present-day activities, such as landfills, wastewater treatment plants, and food and animal waste digesters. These waste sources naturally produce a potent GHG – methane – as they decompose, so RNG production captures methane that would otherwise escape into the atmosphere. The captured gas is purified to remove components such as water, carbon dioxide, and hydrogen sulfide.

Fuel Consumption

Jet A fuel is delivered via the BP Olympic Pipeline. The total volume of Jet A supplied to aircraft at SEA in 2022 was 595,696,138 gallons. The BP Olympic Pipeline is near capacity with delivery of its existing fuel products and during summer peak operations at SEA there are often challenges with having enough jet fuel in storage tanks to meet minimum storage levels per the Fuel Consortium’s standards / policies. The Fuel Consortium (an airline group) and BP Olympic Pipeline coordinate additional jet fuel deliveries outside the normal schedule as needed.

The Port maintains a diesel and renewable diesel supply contract for vehicles and generators with SeaPort Petroleum, which comes from Targa Sound Terminal in Tacoma. Individual airlines have their own supplies for diesel. However, some of the Port’s diesel supply is used for airline equipment. The total amount used by SEA vehicles and generators in 2022 was 44,257 gallons of fossil diesel, and 29,029 gallons of renewable diesel. The Port estimates that the airlines, caterers, etc. use about 400,000 additional gallons of diesel in their GSE per year. Biodiesel is not used at SEA.

The Port has a gasoline supply contract with SeaPort Petroleum. In 2022, 124,140 gallons of gasoline was delivered for SEA use. The airlines purchase gasoline separately. Volumes used by airlines are difficult to estimate commercially, but it is reasonable to assume that airlines, caterers, and other SEA businesses use about 400,000 additional gallons of gasoline per year.

Water

Seattle Public Utilities provide water for SEA and off-Airport properties are supplied by local water districts, including King County Water Districts 49 and 125, and Highline Water District 75. Off-airport refers to properties north of 518 (King County Water District #125), south of 188th Street (Highline

Water District #75), and the far west portion of the airport (King County Water District #49). **Table 3-19** shows the primary water consumption at SEA from 2016 to 2022.

TABLE 3-19: WATER CONSUMPTION

Year	Water Consumption (CCF[1])	Water Consumption (Gallons)
2016	325,860	243,760,225
2017	328,440	245,690,199
2018	361,551	270,458,106
2019	367,451	274,871,299
2022	516,450[2]	386,304,600

[1] CCF = centrum cubic feet (or 100 cubic feet).
[2.] The increase in consumption in 2022 was due to a water leak that has been corrected.
Source: Data provided by the Port from Seattle Public Utility Account numbers 0982930000, 4789950000, and 5789950000.

Other Natural Resources

Other natural resources used at SEA include dirt for fill material, concrete, asphalt, water, wood, and gravel. These resources are available in the Puget Sound region, and there are multiple providers of such resources in the vicinity of SEA.[29] According to natural resource mapping of the area, no scarce or unusual resources are present within the GSA.[30]

3.3.11 Noise and Noise-Compatible Land Use

Sound is a physical phenomenon consisting of pressure fluctuations that travel through a medium, such as air, and are sensed by the human ear. Noise is considered an unwanted sound that can disturb routine activities (e.g., sleep, conversation, student learning) and can cause annoyance. Aviation noise primarily results from the operation of fixed and rotary-wing aircraft, such as departures, arrivals, overflights, taxiing, and engine run-ups. Refer to **Appendix J, Noise and Noise-Compatible Land Use** for more detailed information on noise and the noise analysis.

3.3.11.1 Regulatory Setting

TABLE 3-20: STATUTES AND REGULATIONS RELATED TO NOISE AND NOISE-COMPATIBLE LAND USE

Statute	US Code Implementing Regulation	Oversight Agency	Summary
Airport and Airway Improvement Act of 1982	49 U.S.C. § 47101 et seq.	FAA	Authorizes funding for noise mitigation and noise compatibility planning and projects, and establishes certain requirements related to noise-compatible land use for federally-funded airport development projects.
Aviation Safety and Noise Abatement Act of 1979	49 U.S.C. § 47501 et seq. 14 CFR part 150	FAA	Directs the FAA to establish, by regulation, a single system for measuring noise and determining the exposure of people to noise; and time of occurrence; and to identify land uses normally compatible with various noise exposures.

[29] WACA (Washington Aggregates and Concrete Association) Member Directory. www.washingtonconcrete.org/member-list-public, accessed August 9, 2023.
[30] WDNR. Coal, metallic, and mineral resources map of Washington. https://www.dnr.wa.gov/programs-and-services/geology/energy-mining-and-minerals/coal-metallic-and-mineral-resources#major-metallic-minerals-in-washington, accessed August 9, 2023.

Potential impacts from airport noise, relative to the land uses surrounding an airport, are determined by modeling and mapping the Day-Night Noise Level (DNL). DNL is a cumulative sound level that provides a measure of the total sound energy during a specified time period. DNL logarithmically averages the sound levels at a location over a 24-hour period, with a 10-decibel (dB) weighted penalty added to noise events occurring during nighttime hours between 10:00 p.m. and 6:59 a.m. The 10-dB penalty represents the added intrusiveness of noise that occurs during sleeping hours, when ambient sound levels are typically lower than during daytime hours.

FAA Order 1050.1F requires the use of the latest version of FAA's AEDT[31]. FAA Order 1050.1F also identifies 65 DNL as the required metric to determine if there is a significant impact. The FAA uses the 14 CFR Part 150, *Airport Noise Compatibility Planning*, land use compatibility guidelines, and standards set out in Appendix A to Part 150. Below 65 DNL, all land uses are determined to be compatible with airport noise.

3.3.11.2 Existing Conditions

Aircraft Noise Modeling Methodology and Input

To calculate DNL noise exposure levels for SEA, several categories of information were collected for input into AEDT. These inputs included the number of operations by aircraft type, the number of operations by time of day, runway layout, runway end use, flight track location, flight track use, engine run-up (testing) locations, engine run-up activity, and departure trip length. The noise analysis conducted considered the area where the predominant arrival and departure flight tracks occur, as well as less routinely flown flight tracks.

Existing Condition Noise Contour

Exhibit 3-9 graphically depicts the average-annual noise contour for the Existing (2022) Condition. The 65 DNL noise contour of the Existing (2022) Condition encompasses 8.8 total square miles within the cities of Burien, Des Moines, and SeaTac, and unincorporated King County. The 65 DNL contour extends approximately 3.4 miles to the north and 2.8 miles south of SEA. The area within the contour to the north and south is made up of a mix of residential, commercial, and industrial land uses.

Noise-Compatible Land Use

Based on FAA's Land Use Compatibility Guidelines, 65 DNL is the exterior noise level where noise sensitive land uses (residences, places of worship, schools, libraries, and nursing homes) are not compatible with aircraft noise. All land uses with noise levels below 65 DNL are considered compatible with airport noise.

Summaries of the residential population and housing units exposed to noise levels exceeding 65 DNL for the Existing (2022) Condition noise contour are provided in **Table 3-21**. A total of 6,216 housing units are located within the 65+ DNL noise contour. A list of noise sensitive facilities within the 65+ DNL Noise Contour for the Existing (2022) Condition are listed in **Table 3-22**. There are nine schools (five have been sound insulated and one additional school is in the process of being sound insulated), 19 places of worship, three nursing homes, and two libraries within the 65+ DNL noise contour.

[31] FAA, 2023, AEDT, Version 3f (latest version when modeling was completed). https://aedt.faa.gov/3f_information.aspx.

EXHIBIT 3-9: EXISTING (2022) CONDITION NOISE CONTOUR

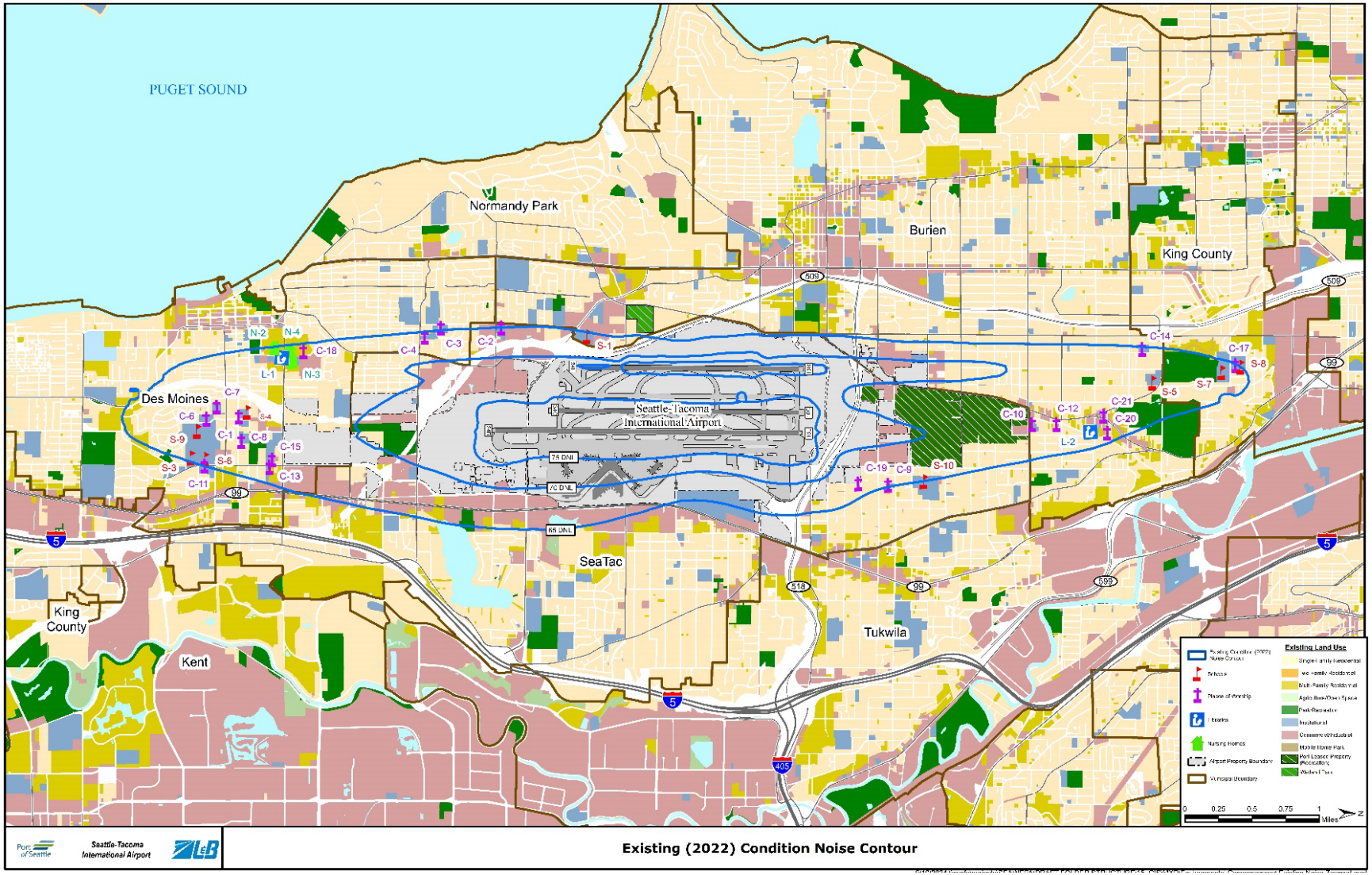

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TABLE 3-21: NON-COMPATIBLE LAND USE HOUSING AND POPULATION BY CONTOUR BAND – EXISTING CONDITION

Mitigation Status / Land Use	DNL 65-70 dB	DNL 70-75 dB	DNL 65+ dB
Sound Insulation Completed			
Single-Family	3,100	93	3,193
Multi-Family	349	0	349
Mobile Home	0	0	0
Subtotal	3,449	93	3,542
Not Sound Insulated			
Single-Family	649	13	662
Multi-Family	1,887	0	1,887
Mobile Home	119	6	125
Subtotal	2,655	19	2,674
Total Housing Units	**6,104**	**112**	**6,216**
Total Estimated Population	**13,754**	**307**	**14,061**

Note: Population numbers are estimates based on the 2020 United States Census average household size per number of housing units.
Source: Port of Seattle, Landrum & Brown, 2024.

TABLE 3-22: NOISE SENSITIVE FACILITIES IN THE EXISTING (2022) CONDITION 65+ DNL NOISE CONTOUR

Map ID	Type of Facility	Name
S-1	School	Puget Sound Skills Center
S-3	School	Midway Elementary School
S-4	School	Mount Rainier High School
S-5	School	Southern Heights Elementary School (Closed)
S-6	School	Pacific Middle School
S-7	School	Beverly Park Elementary School
S-8	School	Our Lady of Lourdes School
S-9	School	St. Philomena Catholic School
S-10	School	Glacier Middle School
C-1	Place of Worship	Saint Philomena Catholic Church
C-2	Place of Worship	Prince of Peace Lutheran Church
C-3	Place of Worship	Samoan Christian Fellowship
C-4	Place of Worship	Normandy Christian Church
C-6	Place of Worship	Hope Church
C-7	Place of Worship	Gospel Russian Baptist Church
C-8	Place of Worship	The Mountain Church
C-9	Place of Worship	Riverton Heights Baptist Church
C-10	Place of Worship	Boulevard Park Presbyterian
C-11	Place of Worship	Midway Community Covenant Church
C-12	Place of Worship	Apostolic Bible Church of Jesus Christ
C-13	Place of Worship	Highline 7th Day Adventist Church
C-14	Place of Worship	Glen Acres Church of Christ
C-15	Place of Worship	Kingdom Hall of Jehovah's Witnesses
C-17	Place of Worship	Our Lady of Lourdes Church
C-18	Place of Worship	Pacific Northwest United Methodist
C-19	Place of Worship	Wat Buddharam Buddhist Temple
C-20	Place of Worship	Hanuman Nagri Temple
C-21	Place of Worship	Way of Salvation Church
L-1	Library	Des Moines Library
L-2	Library	Boulevard Park Library
N-2	Nursing Home	Wesley Homes Terrace
N-3	Nursing Home	Wesley Homes Health Center
N-4	Nursing Home	Wesley Homes Gardens and Bungalows

Source: Port of Seattle, Landrum & Brown analysis, 2024.

3.3.12 Socioeconomic, Environmental Justice, and Children's Health and Safety Risks

3.3.12.1 Socioeconomic

A socioeconomic analysis evaluates how elements of the human environment such as population, employment, housing, and public services might be affected by the Proposed Action and alternatives.

Regulatory Setting

TABLE 3-23: STATUTE AND REGULATION RELATED TO SOCIOECONOMIC IMPACTS

Statute	U.S. Code Implementing Regulation	Oversight Agency	Summary
Uniform Relocation Assistance and Real Property Acquisitions Policy Act of 1970	42 U.S.C. § 61 et seq. 49 CFR part 24	FHWA	The Act contains provisions that must be followed if acquisition of real property or displacement of people would occur as a result of implementing the selected alternative.

Note: FHWA = Federal Highway Administration.

Existing Conditions

This analysis relies on data from the 21 census block groups that are wholly or partially within the GSA (see **Exhibit 3-10**) or the 135 census blocks that are wholly or partially within the GSA (see **Exhibit 3-11**) depending on the availability of data being analyzed. This EA relies on the smallest geographic area for which current demographic and economic data was available for each category of data. However, it is important to note that portions of these census block groups and blocks fall outside of the GSA. The following sections describe population, employment, income, housing, and access to public transportation and services within the entire census block group and / or block.

Economic Activity and Income

SEA is an important driver for the economy near the Airport, in King County, and in Washington State. In 2017,[32] SEA's on-site activities directly supported 19,100 jobs and $1.4 billion in total compensation. Offsite, the economic benefit of SEA includes businesses serving passengers (such as restaurants and hotels), companies supplying goods and services to SEA, and employee income being spent outside of SEA. In total, the regional economic impact of SEA resulted in approximately $22.5 billion in business revenue, 151,400 jobs (representing over $3.6 billion in direct earnings), and more than $442 million in state and local taxes (**Table 3-24)**.[33]

[32] The most recent year for which full economic statistics were available.
[33] Sea-Tac International Airport Economic Impacts, 2018.

TABLE 3-24: ECONOMIC EFFECT OF THE AIRPORT (2017)

Economic Indicator	Total
Direct Jobs	87,300
Indirect Jobs	22,700
Induced Jobs	41,400
Total Jobs	151,400
Direct Total Compensation (in millions)	$3,650.8
Indirect Total Compensation (in millions)	$1,251.4
Induced Total Compensation (in millions)	$2,197.3
Total Compensation (in millions)	$7,099.5
Direct Business Revenue (in millions)	$11,481.3
Indirect Business Revenue (in millions)	$4,451.8
Induced Business Revenue (in millions)	$6,544.9
Total Business Revenue (in millions)	$22,477.0

Notes: Direct impacts are activities directly on-Airport property. Indirect impacts are business-to-business transactions tied to on-site activities. Induced impacts are worker income expenditures across other parts of the economy.
Source: Sea-Tac International Airport Economic Impacts, 2018.

Overall, per capita income and Median Household Income (MHI) for the GSA were below levels reported for King County and the State of Washington in 2021 (**Table 3-25**).[34]

TABLE 3-25: INCOME DATA IN 2021

	GSA	King County	State of Washington
Per Capita Income	$32,199	$63,930	$46,177
MHI	$73,957	$110,586	$82,247

Source: United States Census American Community Survey, 1-Year Estimates, Tables B17021, B19013, and B19301 (2021).

Employment

Overall, the unemployment trends for the GSA and King County are similar to those of the state as a whole (**Table 3-26)**.

TABLE 3-26: UNEMPLOYMENT RATES

Year	GSA	King County	State of Washington
2019	5.7%	3.5%	4.6%
2020	5.5%	4.3%	4.9%
2021	6.2%	5.7%	5.9%
2022	5.3%	3.6%	4.1%

Note: Rate represents unemployment rate in civilian labor force, over 16 years of age.
Source: United States Census American Community Survey 1 and 5-Year Estimates, Table B23025 (2017-2021).

[34] The most recent year for which GSA income was available.

EXHIBIT 3-10: CENSUS BLOCK GROUPS USED IN DEMOGRAPHIC ANALYSIS

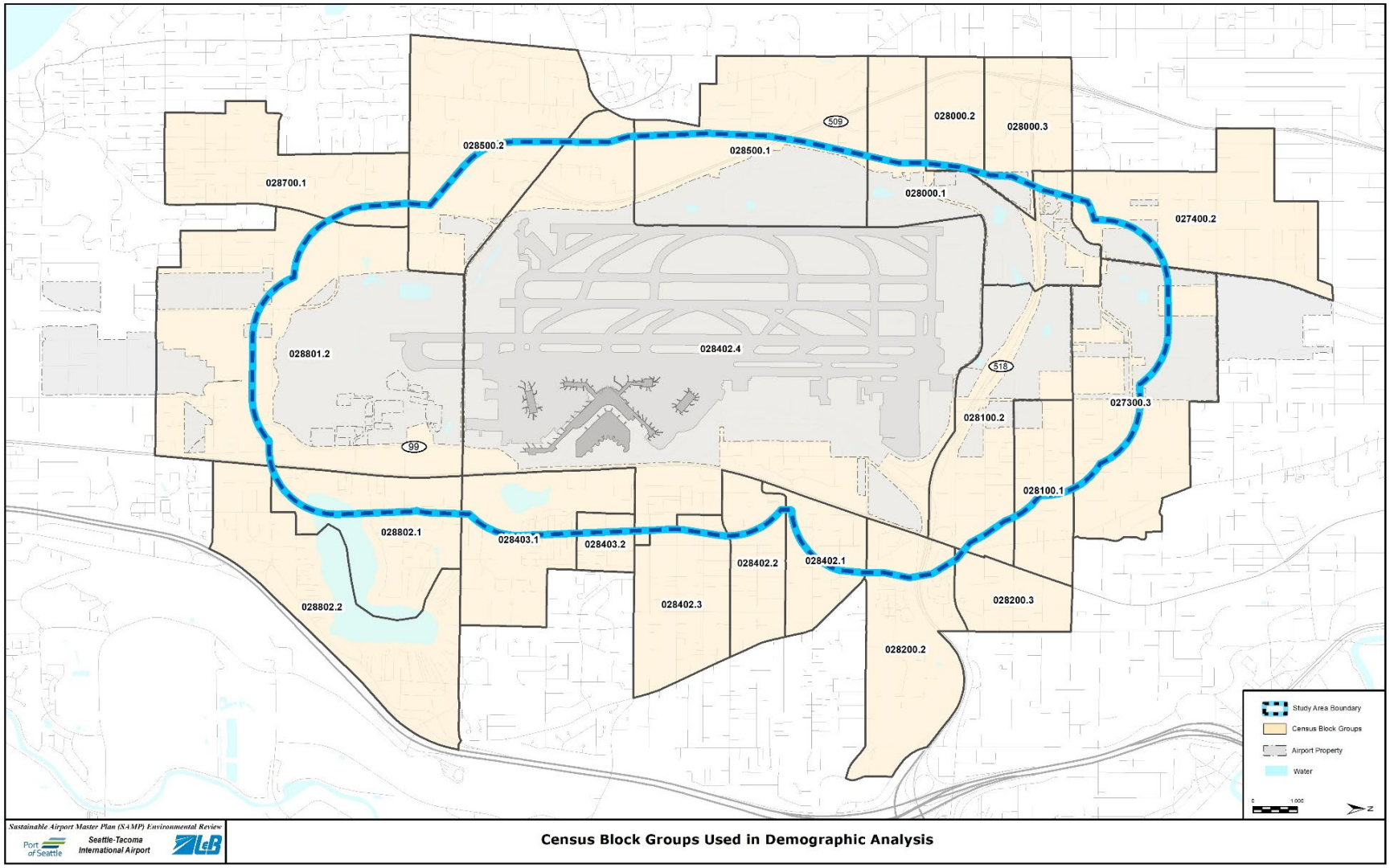

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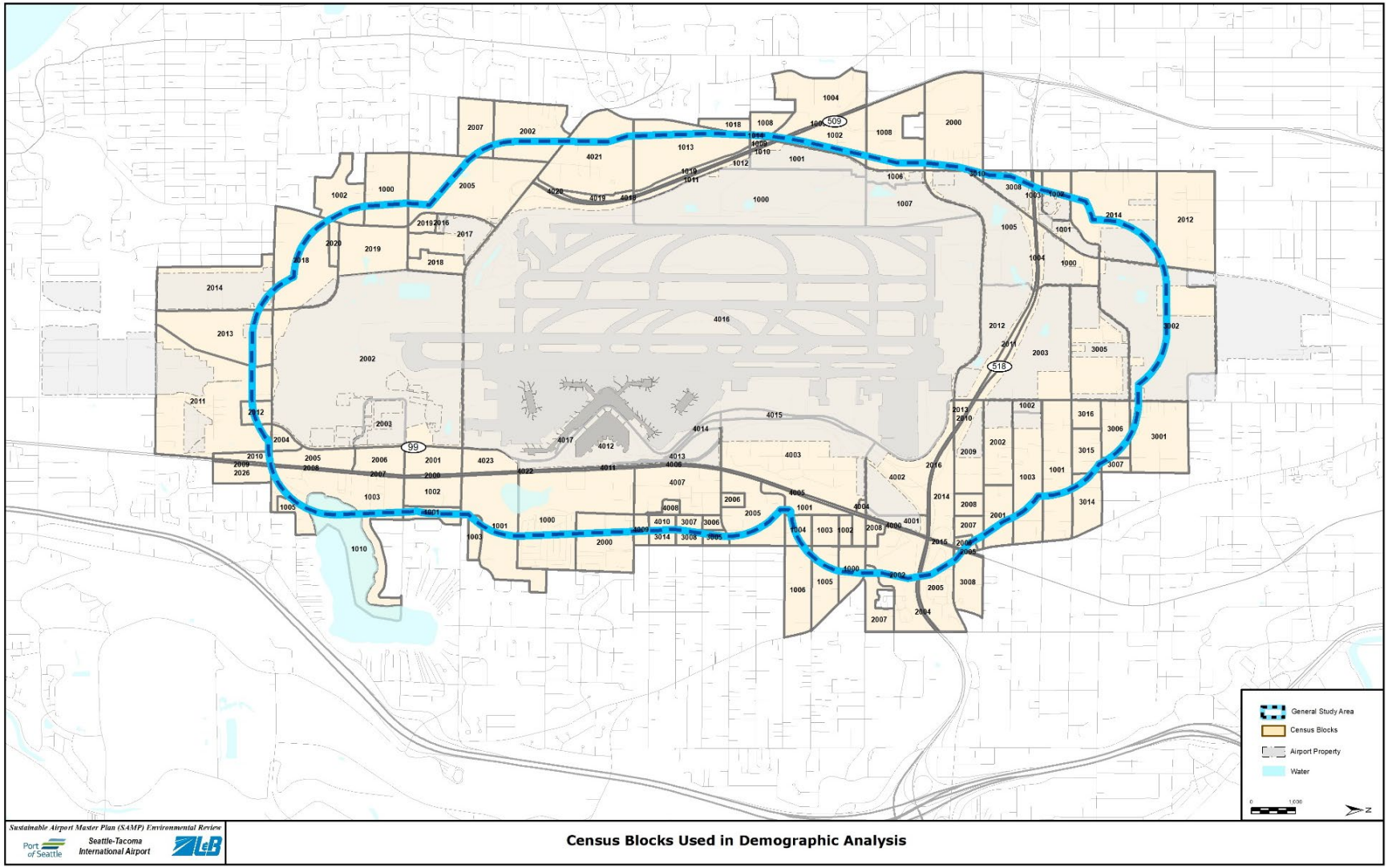
EXHIBIT 3-11: CENSUS BLOCKS USED IN DEMOGRAPHIC ANALYSIS



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Population and Housing

The populations of the GSA, King County, and the State of Washington are shown in **Table 3-27**. In general, the GSA contains higher levels of children and lower levels of elderly populations than King County or the State of Washington. Because the census blocks extend beyond the actual GSA, the census estimates of population totals for the GSA are higher than the actual number of people that reside within the GSA.

TABLE 3-27: POPULATION DATA IN 2021

	GSA[35]	King County	State of Washington
Population	14,843	2,252,305	7,738,692
Children (under 18 years of age)	23.3%	19.8%	21.7%
Elderly Population (over 65 years)	12.8%	13.7%	16.2%

Note: 2021 represents the most recent year that a full data set was available for socioeconomic data within the GSA.
Source: United States Census Bureau American Community Survey, 1-year estimates, Tables B01001 and B03002 (2021).

Based on population forecasts prepared by the PSRC, the population of King County is expected to continue to grow, as indicated in **Table 3-28**.

TABLE 3-28: POPULATION FORECASTS

Area	2025	2030	2035	2040
King County	2,397,486	2,526,407	2,654,692	2,782,579

Source: PSRC Land Use Vision - Implemented Targets County Summaries 2023.

Housing data for King County, and the State of Washington is provided in **Table 3-29**. Similar data was not available for the GSA.

TABLE 3-29: HOUSING DATA

Area	Total Housing Units (2021)	Vacancy Rate (2021)	Median Home Value (2021)
King County	985,324	6.1%	$750,100
State of Washington	3,257,140	7.2%	$485,700

Source: United States Census Bureau American Community Survey, 1-year estimates, Table CP04 (2021).

Public Services

Residents of communities in the GSA have access to a wide range of public services. Public services include such facilities as educational institutions (public and private), medical services, emergency response services, and ground transportation / transit.

Educational Facilities

King County is divided into 12 school districts. Only the Highline School District is within the GSA (**Table 3-30)**. The locations of these facilities are depicted on **Exhibit 3-12**.

[35] This column refers to the Census block groups that are touched by the GSA.

TABLE 3-30: EDUCATIONAL FACILITIES LOCATED WITHIN GSA

Map ID	School / Facility	School District
S-1	Puget Sound Skills Center	Highline
S-2	Choice Academy	Highline

Sources: King County GIS data; Landrum & Brown analysis.

Emergency Services

Various state, county, regional, and local emergency services are provided within the GSA (**Table 3-31)**. The locations of these facilities are depicted on **Exhibit 3-13**.

TABLE 3-31: EMERGENCY SERVICES WITHIN THE GSA

Map ID	Public Service / Facility	Authority
PD-1	Port of Seattle Police	Port of Seattle
PD-2	Washington State Police, District 2 – Seattle South Detachment	State of Washington
F-1	Port of Seattle – Airport Rescue and Fire Fighting	Port of Seattle
F-2	Port of Seattle – Interim Fire Station	Port of Seattle

Note: There are no medical facilities within the GSA.
Sources: King County GIS data; Landrum & Brown, 2023.

EXHIBIT 3-12: EDUCATIONAL FACILITIES LOCATED WITHIN THE GSA

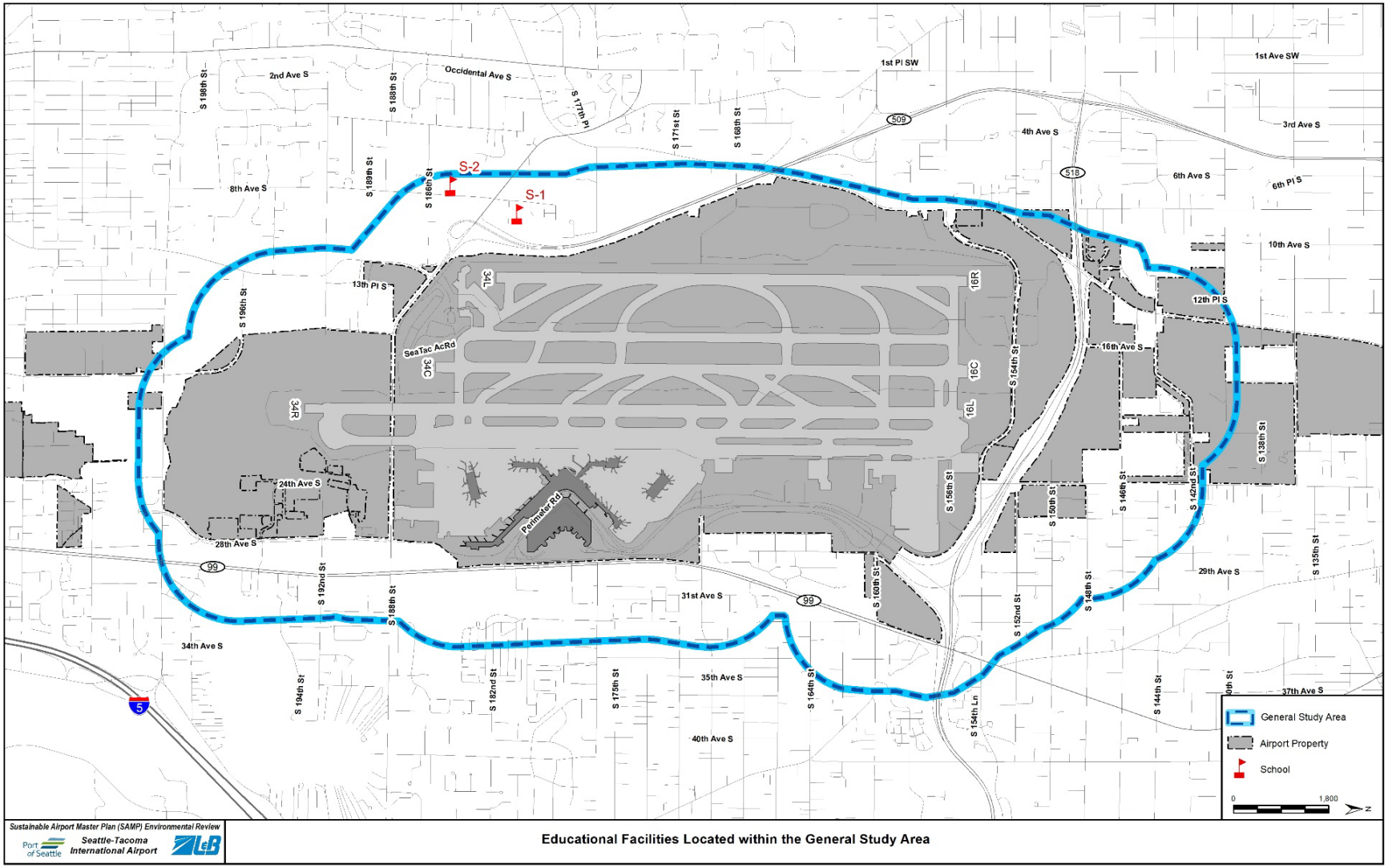

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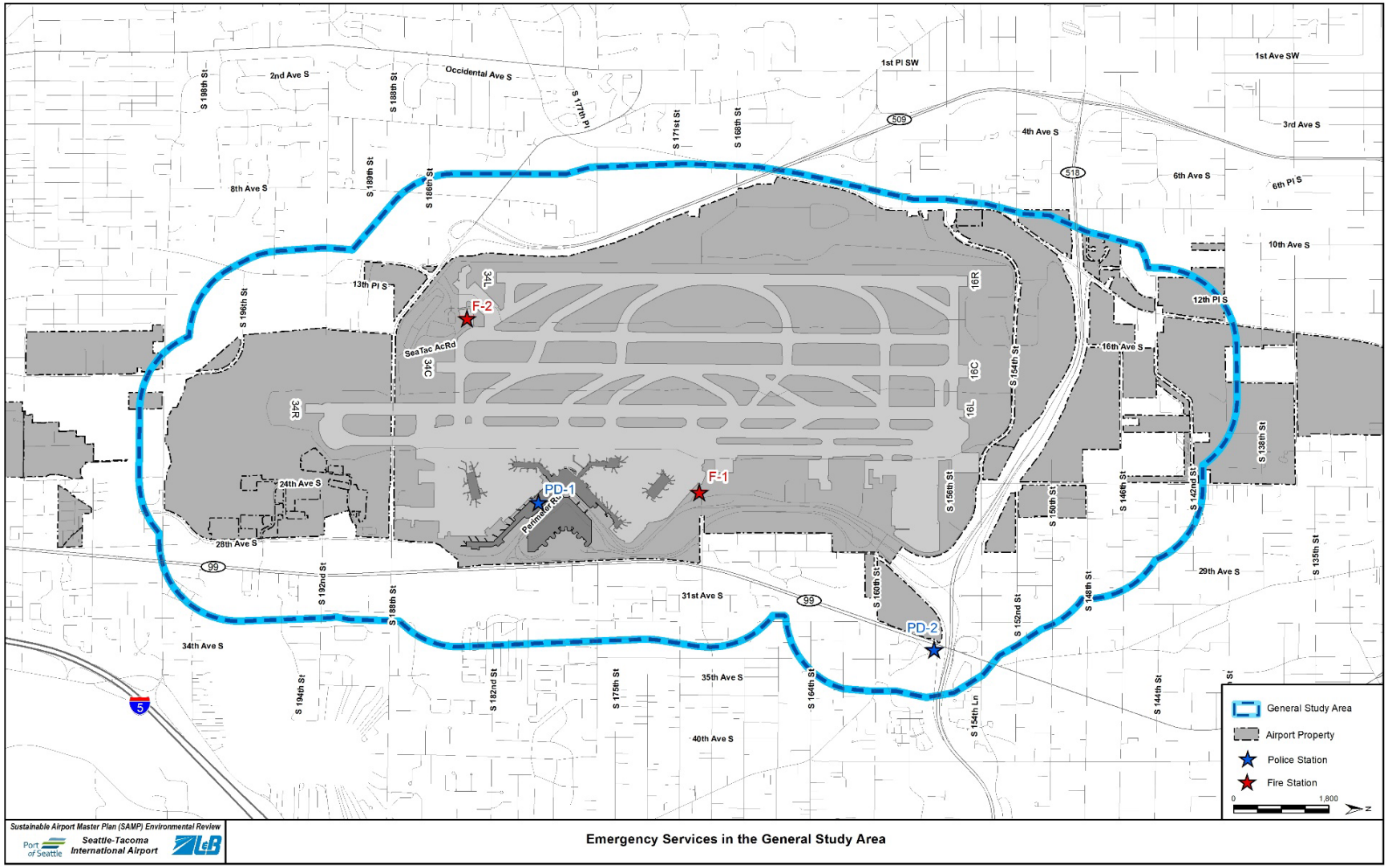
EXHIBIT 3-13: EMERGENCY SERVICES LOCATED WITHIN THE GSA



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3.3.12.2 Environmental Justice

Since the publication of the Draft EA, EOs 12898, 13985, 14091, and 14096 were revoked on January 20, 2025. On January 21, 2025, President Trump issued EO 14173, *Ending Illegal Discrimination and Restoring Merit-Based Opportunity*. In addition, CEQ revoked its regulations (40 CFR parts 1500-1508) implementing NEPA, 42 U.S.C. 4321 *et seq*., as amended, in response to EO 14154. Consequently, it is no longer a legal requirement or the policy of the federal government to conduct environmental justice analyses. As a result, this Final EA has removed the prior discussion of, and data/analysis related to, environmental justice.

3.3.12.3 Children's Environmental Health and Safety Risks

Children's environmental health risks and safety risks include risks to health or to safety that are attributable to products or substances that a child is likely to come in contact with or ingest, such as air, food, drinking water, recreational waters, soil, or products they might use or be exposed to.

Regulatory Setting

TABLE 3-32: EXECUTIVE ORDER RELATED TO CHILDREN'S ENVIRONMENTAL HEALTH AND SAFETY RISKS

Statute	U.S. Code Implementing Regulation	Oversight Agency	Summary
Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks	62 Federal Register 19885, (April 23, 1997)	No Applicable	Directs federal agencies to analyze their policies, programs, activities, and standards for any environmental health or safety risks that may disproportionately affect children. Included in these categories are risks to health or safety that are attributable to products or substances that a child is likely to come in contact with or ingest, such as air, food, water, recreational waters, soil, or products they might use or be exposed to.

Existing Condition

The total percentage of the population within the GSA block groups that is under the age of 18 is 23.3 percent, as shown on **Table 3-33**. The percentage of children per block group is shown on **Exhibit 3-14**. As discussed above, the census block groups extend beyond the GSA and therefore include children residing outside the GSA.

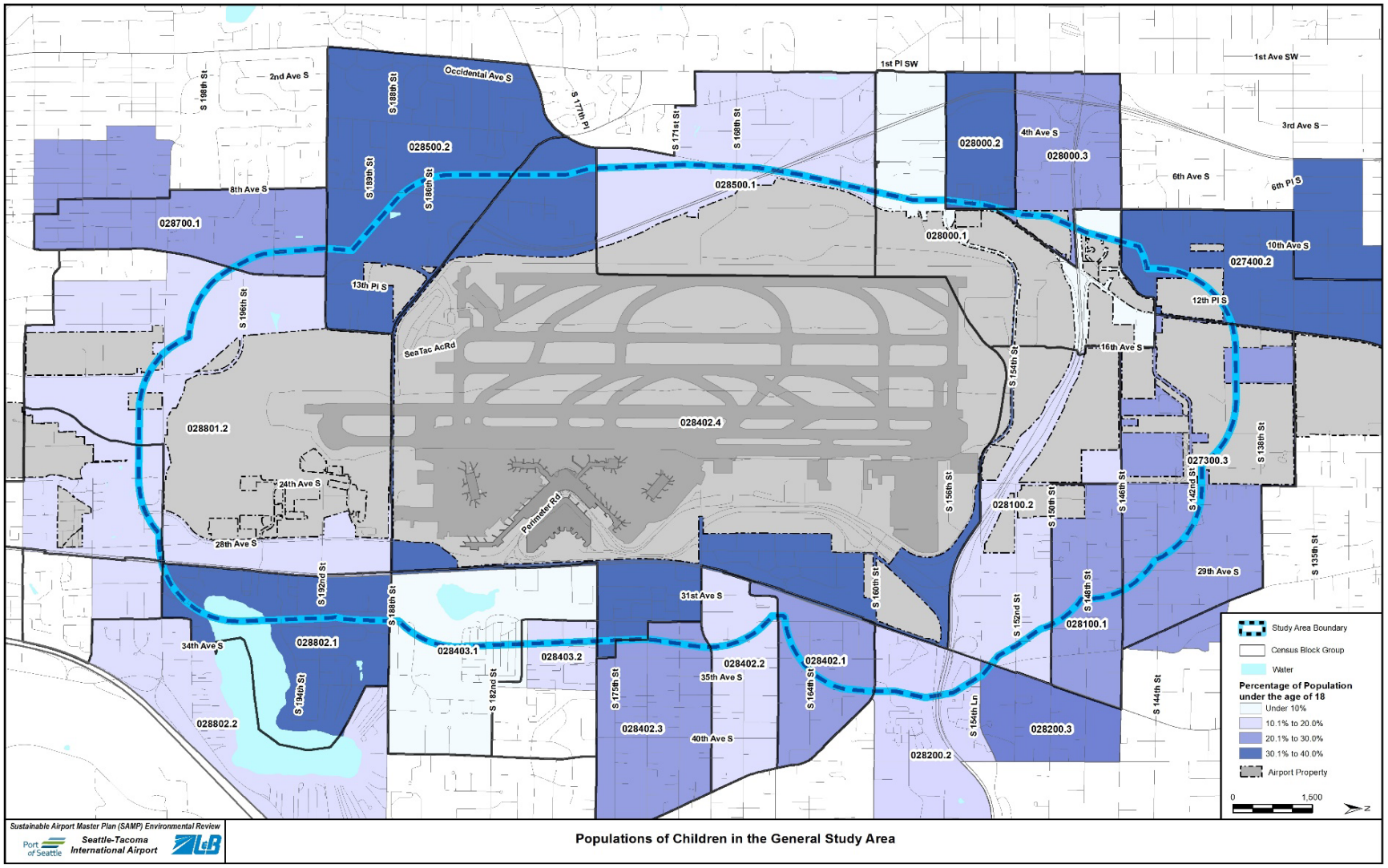
TABLE 3-33: PERCENTAGE OF POPULATION UNDER THE AGE OF 18

Age of Child	GSA	King County	State of Washington
Under 5 years old	7.2%	5.3%	5.6%
5 to 9 years old	6.1%	5.4%	6.0%
10 to 14 years old	6.6%	5.9%	6.4%
15 to 17 years old	3.4%	3.3%	3.7%
Total	**23.3%**	**19.8%**	**21.7%**

Source: United States Census Bureau, 2021 American Community Survey 1 and 5-Year Estimates, Table B01001 (2021).

This analysis focuses on locations where children spend time, outside of their residences, and can be exposed to environmental health risks. This includes schools and child-care centers, public parks, recreation facilities, and medical facilities. Within the GSA there are two schools (Puget Sound Skills Center and Choice Academy, which were shown previously on **Exhibit 3-12**). No licensed child-care facilities are located within the GSA. There are no medical facilities within the GSA. Public parks and recreation facilities within the GSA are shown in **Table 3-11**.

EXHIBIT 3-14: POPULATIONS OF CHILDREN WITHIN THE GSA



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3.3.13 Surface Transportation

Surface transportation refers to the movement of vehicles throughout a roadway and highway network. Primary roads include interstates, highways, and major arterials designed to move traffic but not necessarily to provide access to adjacent areas. Secondary roads include minor arterials and collectors that provide access to residential, commercial, and industrial areas. The capacity of transportation networks and quality of circulation may be described in average daily traffic volumes and / or LOS. **Appendix L, Surface Transportation** provides more detail on transportation, traffic volumes, and transportation options.

3.3.13.1 Regulatory Setting

Traffic analyses are guided by policies and standards set by the Washington State Department of Transportation (WSDOT) and local jurisdictions surrounding the Airport (Burien, Des Moines, SeaTac, Tukwila). The Proposed Action is also subject to the rules and regulations of the Port, which oversees public parking facilities, Airport operations, and commercial vehicle trips at the Airport.

3.3.13.2 Existing Condition

The surface transportation study focused on 108 traffic intersections where direct or indirect traffic impacts may occur as a result of implementing the Action Alternatives. The establishment of the STSA considered the following:

- Major signalized intersections and minor intersections along travel routes to and from the Airport within the GSA.
- Primary and secondary routes of travel between the NTPs and origins / destinations outside the GSA.
- Locations and traffic movements of concern from public and agency feedback received during the scoping process.
- The Traffic Impact Analysis procedures described in the WSDOT Design Manual Chapter 320 – Traffic Analysis.

Each intersection analyzed was assigned a number and is shown on **Exhibit 3-15**. The analysis also considered future planned transportation projects that could affect future traffic conditions at SEA.

Existing Condition Traffic

The Synchro 11® software was used to analyze 108 intersections within the STSA for the PM peak hour to document baseline traffic conditions.[36] Synchro 11® is the industry standard for traffic analyses and is used by most local traffic agencies. The analysis measured average vehicle delay (in seconds) and LOS at each intersection. The intersection LOS was ranked from A to F, with A representing a free flow condition, and F representing a high level of congestion and breakdown in traffic flow.

[36] The PM peak scenario captures the commuter peak which is typically the highest total volume hour of the day at SEA. The Airport may have different peak hours than the commuter peak hour, but the commuter peak hour was modeled to best capture potential impacts.

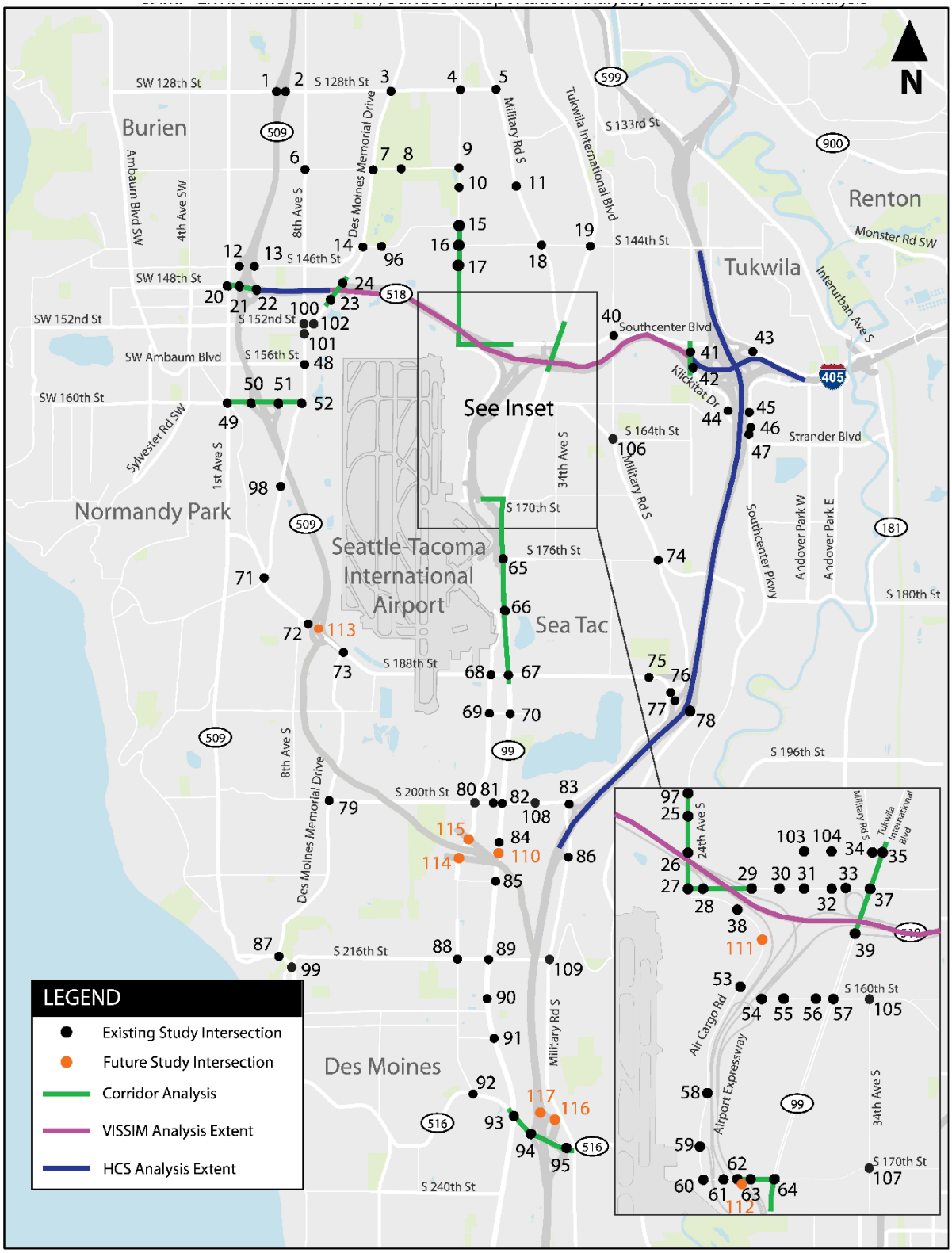
Data for the Existing Condition analysis was primarily collected from turning movement counts collected in Fall 2022 and Spring 2023 as well as WSDOT permanent counter data. Analysis models from the WSDOT led SR 518 Corridor Planning Study were utilized as well as base models that were then updated with current channelization, intersection control, and signal timings. Supplemental information such as signal timings and traffic counts were also collected from the Port of Seattle, King County, WSDOT, and the cities of Tukwila and SeaTac.

The study compared intersection LOS results to mobility standards adopted by local jurisdictions and agencies to identify intersections that do not meet current mobility standards. Of the 108 existing study intersections analyzed, 102 meet jurisdictional mobility standards (LOS). The six existing intersections that do not meet current mobility standards are:

- #23 – SR 518 East Bound Ramps / Des Moines Memorial Drive (LOS F)
- #33 – SR 518 West Bound Off-Ramp Loop / S.154th Street (LOS E)
- #50 – SR 509 South Bound Ramps / SW 160th Street (LOS F)
- #83 – Military Rd. S. / SB I-5 Ramps / S. 200th Street (LOS E)
- #93 – Pacific Hwy S. / SR 516/Kent-Des Moines Road S. (LOS F, Critical v / c 1.24)
- #101 – 8th Ave S. / Des Moines Memorial Drive (LOS F)

A corridor and freeway analysis were performed at the request of WSDOT for information purposes. This information is included in **Appendix L**.

EXHIBIT 3-15: ROADWAY INTERSECTIONS ANALYZED



Note: Intersection labels are not sequential because they are a subset of the larger group of intersections used in the traffic study.

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3.3.14 Visual Effects

Visual effects deal broadly with the extent to which the Proposed Action, or alternative(s) would either:

1. Produce light emissions that create annoyance or interfere with activities; or
2. Contrast with, or detract from, the visual resources and / or the visual character of the existing environment.

For clarity and uniformity, visual effects are broken into two categories:

1. Visual Resources and Visual Character and
2. Light Emission Effects.

3.3.14.1 Regulatory Setting

Although there are no special purpose laws or requirements for visual effects or light emissions, the analysis must consider other special purpose laws and requirements that may be relevant, such as Section 106 of the NHPA for impacts to historic resources, Section 4(f) of the USDOT Act for impacts to parks, wildlife and waterfowl refuges, the ESA for impacts to light sensitive species, and applicable state and local regulations, policies, and zoning.

3.3.14.2 Existing Conditions

The visual effects analysis conducted focused on the areas within the GSA that would offer views of one or more elements of the Proposed Action or alternatives, including light emissions. Much of the southern and western portions of the GSA sit below the elevation of SEA, limiting direct line of sight to runways, taxiways, terminals, and other facilities. The terrain of the eastern portion of the GSA increases above the level of SEA, providing limited views of the existing passenger terminal, parking garage, and airfield. The northern portion of the GSA includes Port-owned properties such as the North Employee Parking Lot (NEPL) and several vacant parcels of land. There are residential areas northeast of the Airport, but existing vegetation and roads (including SR 518 and 24th Avenue South) largely block the line of sight to existing SEA facilities. Representative photos from different vantage points surrounding SEA are provided in **Exhibit 3-16**.

Visual Resources / Visual Character

The facilities at SEA are in an urban setting. SEA's three parallel north-south runways occupy an area that is over one-half-mile wide and two miles long. SEA's support facilities (which include a control tower, the Main Terminal, satellite terminals, multistory parking garage, cargo warehouses, aircraft maintenance structures, and a dedicated freeway providing access to the terminal) occupy an area located on the east side of the runways measuring approximately 0.4 mile wide by 2.5 miles long.

The area around SEA has the highly developed character of a mature suburban community. The most intense development occurs in the corridor along SR 99, which lies immediately to the east of SEA property. The east side of this major arterial is lined with commercial uses, including several multi-story hotels. The one anomaly in this corridor is Washington Memorial Park, an approximately 60-acre cemetery located north of the Main Terminal, between SEA and SR 99. Immediately to the east of the commercial corridor along SR 99, there are multi-family dwellings that transition to neighborhoods of single-family homes further to the east. At the northern and southern ends of the runways, in areas that had once been developed with single-family homes, many residences have been removed, creating open areas with a partially developed character, which in some places (North SeaTac Park in the north and Des Moines Creek Park in the south), are currently available for recreational use. The area to the south of SEA includes a former golf course that is currently undeveloped.

Light Emissions

SEA has various types of lighting on the airfield and landside facilities. Lighting that emanates from the airfield includes runway, apron, and navigational lighting such as, hold position lights, stop-bar lights, and runway and taxiway signage. Airfield lighting is located along taxiways and ramps for guidance during periods of low visibility to assist aircraft movement on the airfield. Aircraft lighting sources, such as landing lights, position and navigation lights, beacon lights, and vehicle lighting are other types of light sources on the airfield. Lights for landside facilities include fixtures associated with buildings, roadways, and parking facilities. SEA is in a highly developed area comprised of other light sources that contribute to the overall light emissions in the area, including hotels, off-Airport parking facilities, and commercial uses.

Residential neighborhoods, which are sensitive to light emissions, are present in all directions of SEA. However, the closest residential area to the Proposed Action is north of SR 518, along S. 150th Street and S. 152nd Street. This area is immediately adjacent to proposed cargo development. There are also residential areas east of International Boulevard / SR 99 in an area of rising terrain from SEA's Main Terminal area.

EXHIBIT 3-16: ADJACENT VIEWSHEDS

S. 176th Street at 32nd Avenue looking west towards the Terminal

State Route 518 looking west towards the approach lights for Runway 34C

S. 156th Way looking southwest towards the airfield

S. 188th Street looking north towards the airfield

Sustainable Airport Master Plan (SAMP) Environmental Review
Port of Seattle — Seattle-Tacoma International Airport

Adjacent Viewsheds

Source: Google Earth Street View Imagery, accessed February 2023 (images from 8/2022 to 11/2022).

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3.3.15 Water Resources

Water resources are surface waters and groundwater that are vital to society; they are important in providing drinking water and in supporting recreation, transportation and commerce, industry, agriculture, and aquatic ecosystems. Surface water, groundwater, floodplains, and wetlands do not function as separate and isolated components of the watershed, but rather as a single, integrated natural system. Disruption of any one part of this system can have consequences to the functioning of the entire system. Wild and Scenic Rivers are included because impacts to these rivers can result from obstructing or altering the free-flowing characteristics of a designated river, an impact more closely resembling an impact to a water resource. See **Appendix M, Water Resources** for details on water resources including surveys and analysis.

3.3.15.1 Regulatory Setting

TABLE 3-34: STATUTES, REGULATIONS, EXECUTIVE ORDERS, AND OTHER REQUIREMENTS RELATED TO THE PROTECTION OF WETLANDS, SURFACE WATER, GROUNDWATER, AND FLOODPLAINS

Statute	U.S. Code Implementing Regulation	Oversight Agency	Summary
Clean Water Act (CWA)	33 U.S.C. §§ 1251-1387 33 CFR parts 320-332 40 CFR parts 230-233	USACE; USEPA	The CWA establishes the basic structure for regulating the discharge of pollutants into waters of the US, which include wetlands. The two primary sections of the CWA relating to wetland impacts and permitting are Section 404 and Section 401. Section 404 establishes a program to regulate the discharge of dredged or fill material into waters of the US, including wetlands. Section 401 requires a Water Quality Certificate for a project to ensure it does not violate state or Tribal water quality standards. Section 401 certifications are generally issued by the state or tribe with jurisdictional authority. Also, Section 402 establishes the National Pollutant Discharge Elimination System (NPDES) permit program.
USDOT Order 5660.1A, Preservation of the Nation's Wetlands	Not Applicable	USDOT	Implements guidelines set forth in Executive Order 11990. Transportation facilities should be planned, constructed, and operated to assure the protection and enhancement of wetlands to fullest extent practicable.
USDOT Order 5650.2, Floodplain Management Protection	Not Applicable	USDOT	Implements the guidelines set forth in Executive Order 11988, Floodplain Management. USDOT agencies should ensure proper consideration is given to avoid and mitigate adverse floodplain impacts in agency actions, planning programs, and budget requests.

TABLE 3-34: STATUTES, REGULATIONS, EXECUTIVE ORDERS, AND OTHER REQUIREMENTS RELATED TO THE PROTECTION OF WETLANDS, SURFACE WATER, GROUNDWATER, AND FLOODPLAINS (CONTINUED)

Statute	U.S. Code Implementing Regulation	Oversight Agency	Summary
Fish and Wildlife Coordination Act	16 U.S.C. §§ 661-667d	USFWS	Requires federal agencies to consult with the USFWS, NMFS (in some instances), and appropriate state fish and wildlife agencies regarding the conservation of wildlife resources when proposed federal or applicant projects may result in control or modification of the water of any stream or other water body (including wetlands).
Executive Order 11990, Protection of Wetlands	42 Federal Register 26961 (May 24, 1977)	USDOT	Requires federal agencies to "avoid to the extent possible the long and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative." The stated purpose of this Executive Order is to "minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands."
Executive Order 11988, Floodplain Management	42 Federal Register 26951 (May 25, 1977)	USDOT	Requires federal agencies to avoid, to the extent possible, the long and short-term adverse impacts associated with the occupancy and modification of 100-year floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative.
Safe Drinking Water Act	42 U.S.C. §§ 300(f)-300j-26 40 CFR parts 141-149	USEPA	Prohibits federal agencies from funding actions that would contaminate an USEPA-designated sole source aquifer or its recharge area.

3.3.15.2 Existing Conditions

Water resources inventories and delineations were conducted for the portions of the GSA where direct impacts associated with the alternatives may occur, while also considering the tributary streams draining these areas and receiving waters potentially affected by stormwater runoff.

Wetlands

Wetlands are areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands are among the most productive ecosystems in the world and provide important functions such as fish and wildlife habitat, floodwater storage, and water filtration.

Wetland delineations in the study area occurred between September 25, 2019 and December 6, 2019. Biologists revisited the study area in March 13 and 25, 2020, to investigate wetland hydrology. A wetland and waters verification to confirm boundaries, wetland quality, and function occurred in January 2024. Thirty-one wetlands were identified in the GSA, totaling approximately 68 acres (**Exhibits 3-18** through **3-21)**. Additional wetlands surrounding SEA are under restrictive covenants and therefore cannot be impacted. These restrictive covenants apply to previous wetland mitigation areas and include the Miller Creek Buffer Mitigation Area, Des Moines Nursery Mitigation Area, and the Des Moines Regional Detention Facility Mitigation Area.

Surface Waters

Streams and Ditches

There are five streams and seven ditches (tributaries) considered potentially jurisdictional by the USACE within the GSA (shown on **Exhibits 3-17** through **3-21**).

Drainage Basins

The GSA is in King County, within the nearshore sub-watershed of Washington's Water Resource Inventory Area 9. It contains portions of the Miller Creek / Walker Creek, Gilliam Creek / Lower Green River, and Des Moines Creek drainage basins. The drainage basins and other prominent water features are depicted on **Exhibit 3-17**.

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EXHIBIT 3-17: SURFACE WATERS AND BASINS

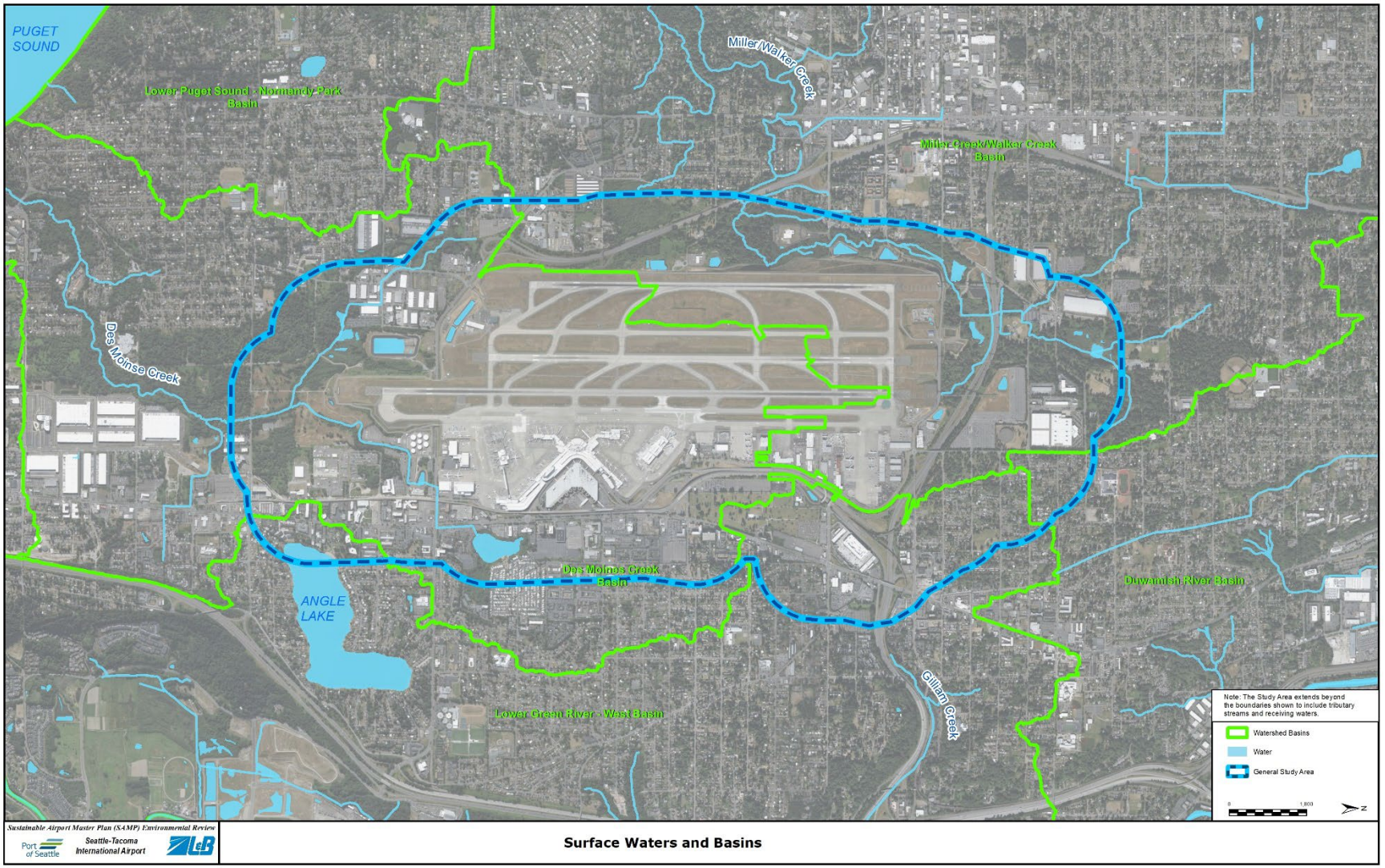

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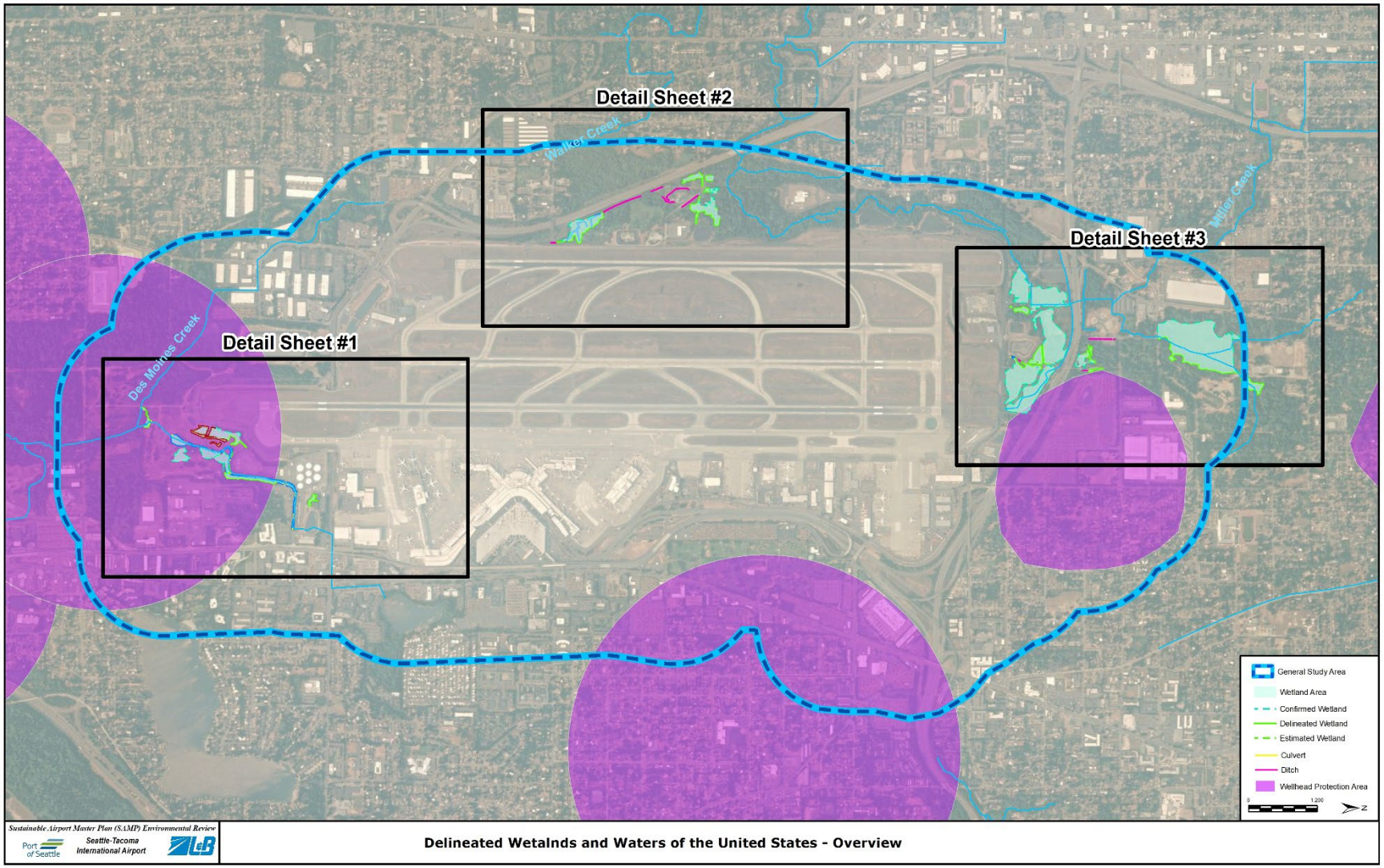
EXHIBIT 3-18: DELINEATED WETLANDS AND WATERS OF THE UNITED STATES – OVERVIEW



Note: Formal delineation of wetland boundaries was completed only in areas where impacts would occur. Estimated boundaries were identified for certain stream and wetland features outside the study area that are not anticipated to be impacted or subject to regulatory compliance. Previously delineated wetland boundaries were confirmed or revised as appropriate.

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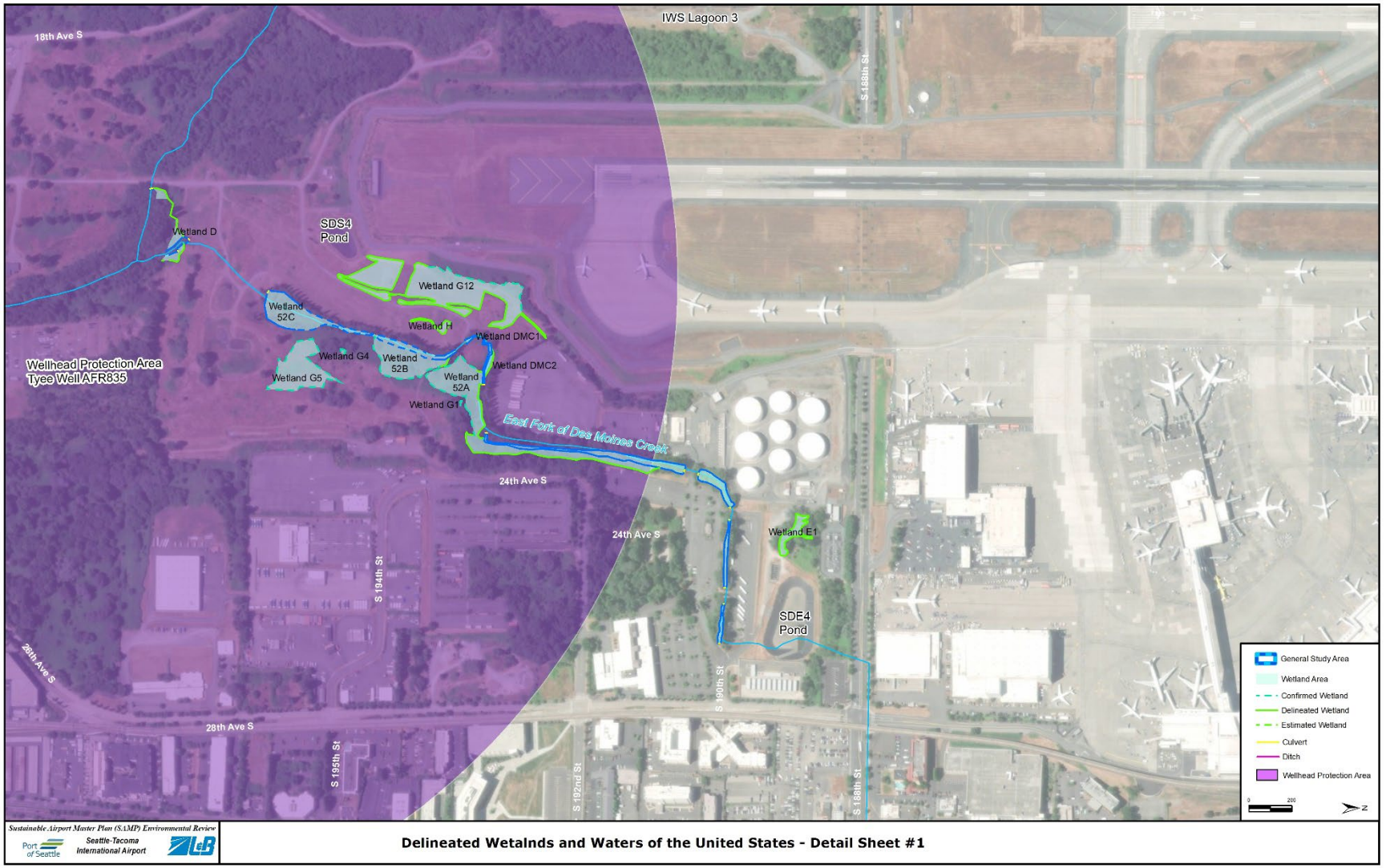
EXHIBIT 3-19: DELINEATED WETLANDS AND WATERS OF THE UNITED STATES – DETAIL SHEET #1



Note: Formal delineation of wetland boundaries was completed only in areas where impacts would occur. Estimated boundaries were identified for certain stream and wetland features outside the study area that are not anticipated to be impacted or subject to regulatory compliance. Previously delineated wetland boundaries were confirmed or revised as appropriate.

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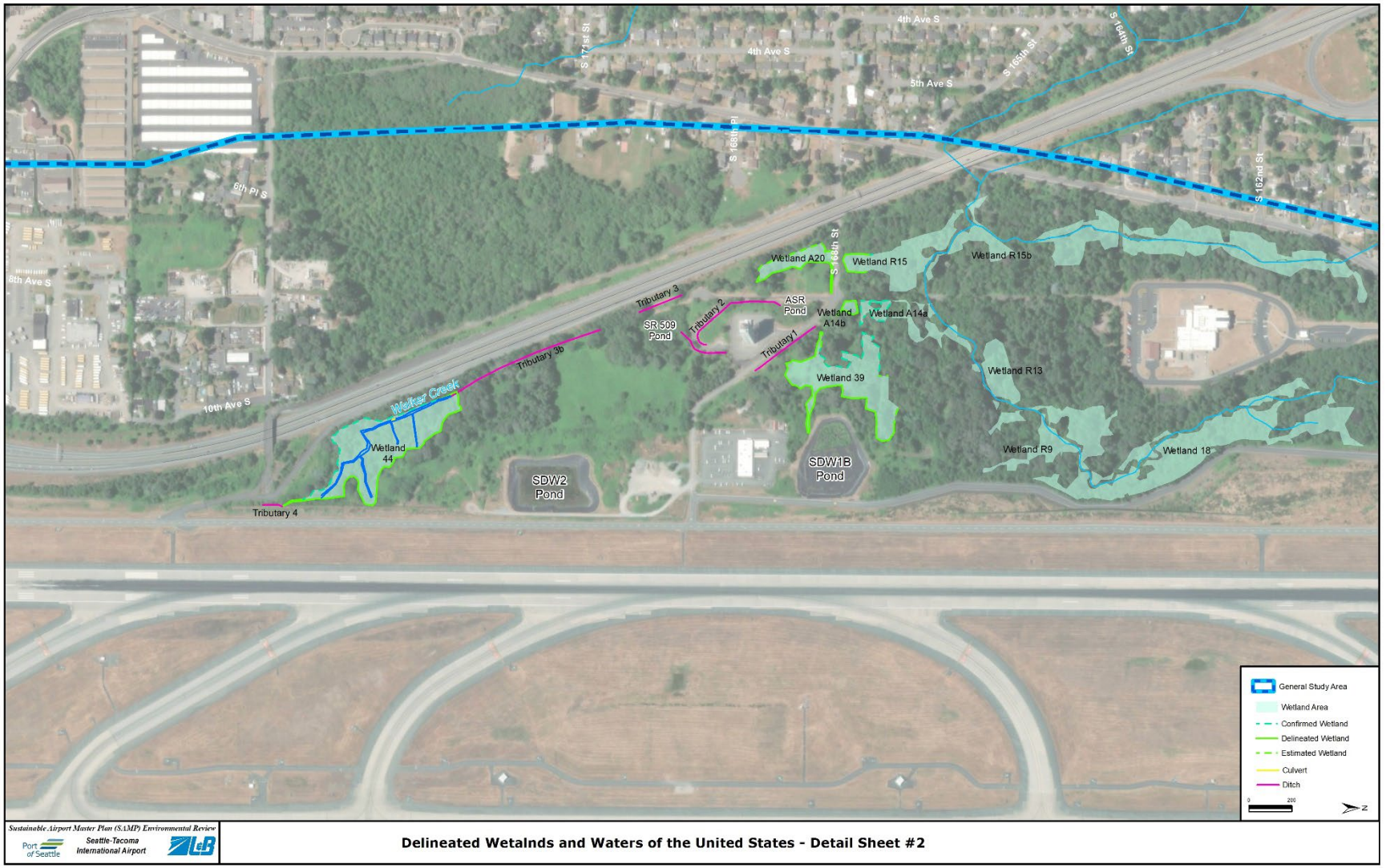
EXHIBIT 3-20: DELINEATED WETLANDS AND WATERS OF THE UNITED STATES – DETAIL SHEET #2



Note: Formal delineation of wetland boundaries was completed only in areas where impacts would occur. Estimated boundaries were identified for certain stream and wetland features outside the study area that are not anticipated to be impacted or subject to regulatory compliance. Previously delineated wetland boundaries were confirmed or revised as appropriate.

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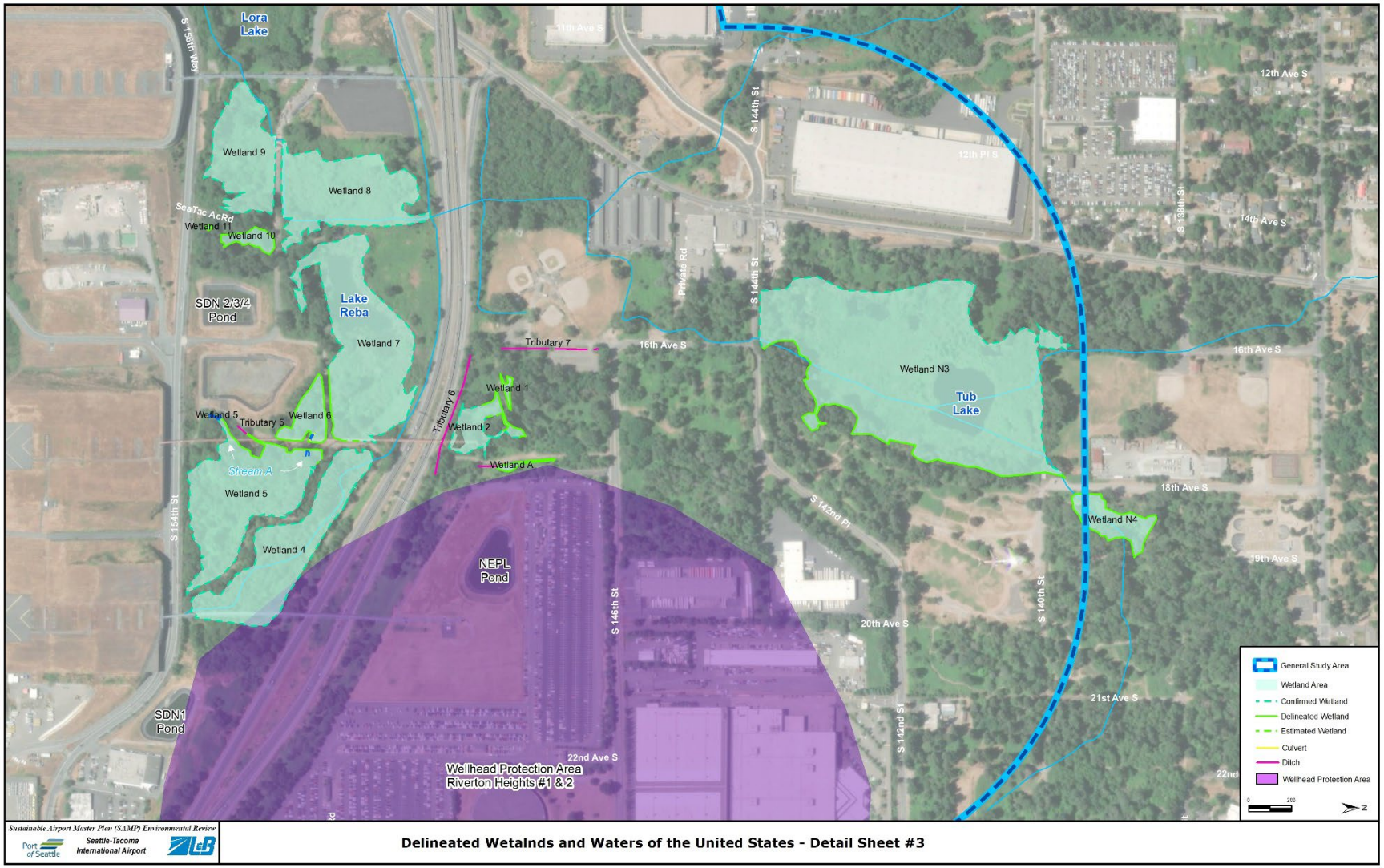
EXHIBIT 3-21: DELINEATED WETLANDS AND WATERS OF THE UNITED STATES – DETAIL SHEET #3



Note: Formal delineation of wetland boundaries was completed only in areas where impacts would occur. Estimated boundaries were identified for certain stream and wetland features outside the study area that are not anticipated to be impacted or subject to regulatory compliance. Previously delineated wetland boundaries were confirmed or revised as appropriate.

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Stormwater Management

SEA's stormwater drainage system (SDS) and industrial wastewater system (IWS) are separate systems that operate independently of each other. The SDS collects stormwater from approximately 1,200 acres. The stormwater drainage is treated by using stormwater ponds, grass swales, and other passive stormwater treatment methods[37] before being conveyed to Lake Reba to the north, Miller Creek to the north and west, Gilliam Creek[38] to the northeast, the Northwest Ponds and Des Moines Creek to the south, and Walker Creek to the west. Lower Walker Creek, lower Miller Creek, a portion of Gilliam Creek, Des Moines Creek are listed on WSDE's 303d list of impaired waterways.

The IWS collects stormwater from the approximately 375 acres where industrial activities are conducted, primarily in the area surrounding the Main Terminal and cargo complex.[39] As part of the IWS system, the Port operates and maintains an industrial wastewater treatment plant to treat stormwater associated with industrial activities from aircraft fueling and maintenance operations as well as wastewater from other Airport related operations such as deicing. Stormwater runoff with high biochemical oxygen demand (BOD)[40] is discharged to King County South Treatment Plant for secondary treatment under an Industrial Waste Discharge Permit through King County (Permit No. 7810-03).[41] Elevated BOD levels are typically associated with stormwater runoff that contains aircraft deicer fluid. The IWS is also permitted to discharge low-BOD stormwater runoff to the Puget Sound via an outfall shared with the Midway Sewer District.

Airport Stormwater Permits

SEA has operated under a NPDES permit since 1980; the current permit (Permit No. WA-0024651) is valid until August 31, 2026. This permit is reissued every five years. This permit established effluent limits from SEA's SDS and IWS. It requires monitoring and reporting of discharges as well as other provisions to track impacts to water quality and ensure compliance with established limits.

As required by the NPDES permit, SEA maintains a Stormwater Pollution Prevention Plans (SWPPP), which was updated in December 2022.[42] The SWPPP meets the requirements of the WSDE's Storm Water Management Manual for Western Washington.

SEA's individual NPDES permit regulates management of all industrial and construction stormwater within the Airport Operations Area (AOA) as defined by the Port and City of SeaTac ILA. Port-owned property and related industrial activities not covered by the SEA permit are regulated via multiple mechanisms including the WSDE general NPDES permits, Port and City of SeaTac ILA, and respective jurisdiction NPDES permits.

[37] Seattle-Tacoma International Airport Stormwater Management Manual, 2017, page 1-8.
[38] The Port is authorized to discharge stormwater associated with construction activities and construction dewatering to Gilliam Creek as part of their NPDES permit. The Airport does not have non-construction stormwater discharge to Gilliam Creek regulated by the NPDES permit. Construction activities related to the NTPs are not expected to result in discharges to Gilliam Creek. Therefore, Gilliam Creek is not addressed further in this document.
[39] Port of Seattle, Sustainability Planning and Management Strategy, Technical Memorandum No. 8 Final, May 2018. Available for review at: https://www.airportprojects.net/sampenvironmentalreview/tm-no-8-environmental-effects-overview/.
[40] BOD represents the amount of dissolved oxygen needed for bacteria or other microorganism to decompose the organic matter that is present.
[41] https://www.airportprojects.net/sampenvironmentalreview/sea-stormwater-and-drainage/.
[42] https://www.airportprojects.net/sampenvironmentalreview/swppp-2022/

City of SeaTac Stormwater Permits

The City SeaTac maintains a comprehensive Stormwater Management Program (SWMP) to meet requirements associated with their NPDES Phase II Municipal Stormwater Permit. The City's SWMP is updated annually, and includes stormwater planning, public education and outreach, methods to detect and eliminate illicit discharges, standards for controlling stormwater runoff, and operations and maintenance guidelines for these facilities. As part of the ILA the City of SeaTac and the Port have defined an Airport Stormwater Utility Boundary that includes most Airport parcels south of SR 518. Areas inside this boundary are subject to the Port's SWPPP. Development on Port property that is outside this boundary is subject to the requirements of the City's SWMP.

Wild and Scenic Rivers

There are no Wild and Scenic Rivers within the GSA.[43] Therefore, further discussion of Wild and Scenic Rivers will not be included in this EA.

Floodplains

Floodplains are valued for their natural flood and erosion control, enhancement of biological productivity, and socioeconomic benefits and functions. Current 100-year and 500-year floodplain information for the area surrounding SEA was compiled from the most recent Flood Insurance Rate Maps (FIRMs) published by FEMA.

As is shown in **Exhibit 3-22,** 100-year and 500-year floodplains, within the GSA are located west and north of Runway 16R associated with Miller Creek. These floodplains are partially on Port-owned property in the vicinity of the proposed employee parking structure (L07), westside maintenance campus (S07), and CRDC (S10).

Groundwater

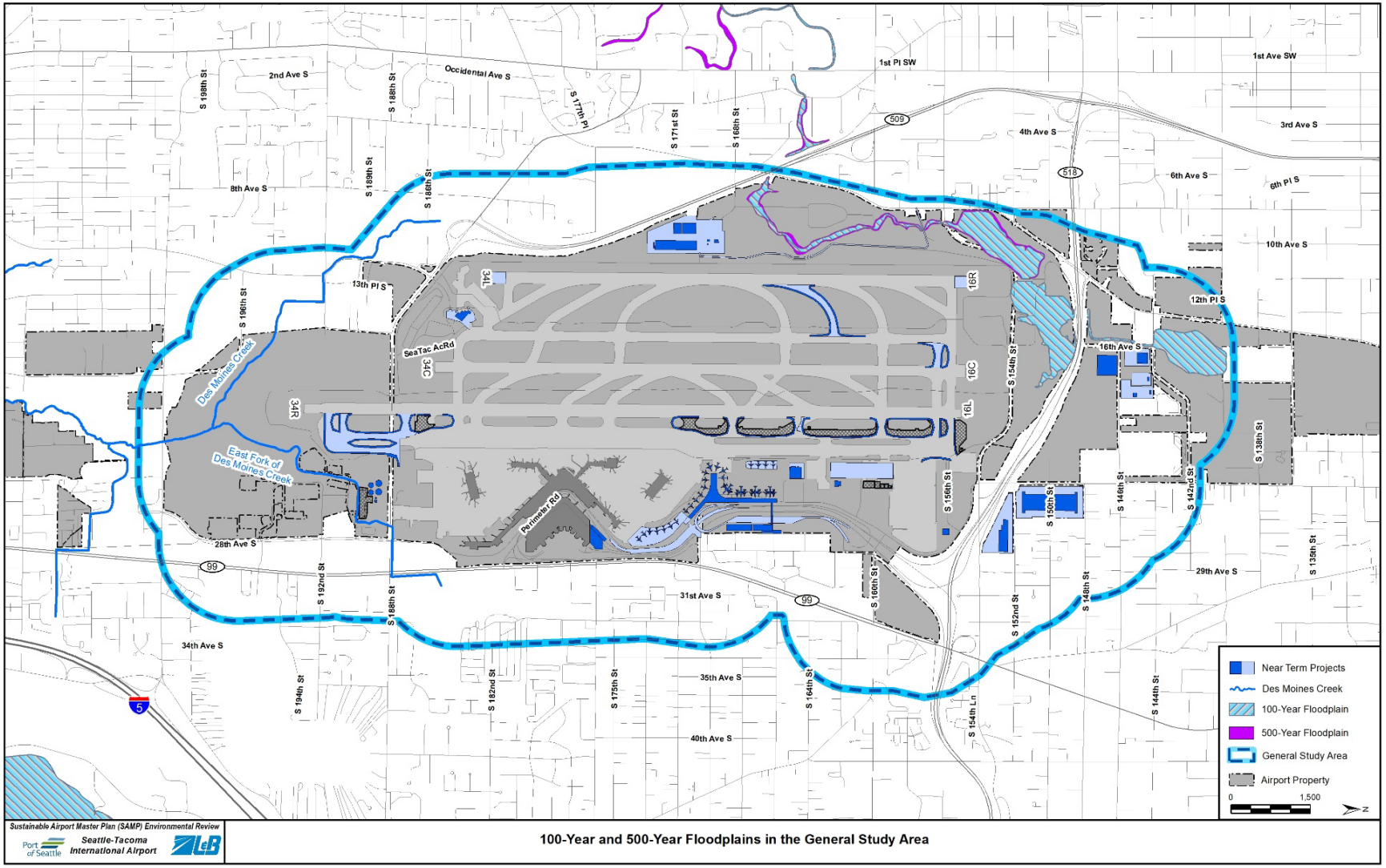
The GSA is located within the South King County Groundwater Management Area (GWMA), which encompasses approximately 260 square miles, mostly within the Green-Duwamish Watershed. Groundwater is the primary source of municipal and potable water used in the South King County GWMA.[44] Several regional aquifers underlie the GSA, the shallowest of which is about 50 to 60 feet beneath ground surface near the SEA terminal.

Portions of three Well Head Protection Areas (WHPA) are located within the GSA (see **Exhibit 3-18**). In Washington State, the Department of Health administers the state Wellhead Protection Program to prevent contamination of groundwater used for drinking water. The Highline Water District has two wells within the GSA. The Tyee well is on Port property approximately one-half-mile south of the airfield; this well is not currently in use. PFAS has been detected in the Tyee Well at levels exceeding the State Action Level, therefore, this well was removed from service. The McMicken Heights well, which came online in 2012, is to the east of the Airport. The well water is filtered, treated, and tested before it is blended with water from Seattle Public Utilities (SPU) and sent to the Water District customers.

SPU has two wells within the GSA. Riverton Heights #1 and #2 are part of a well field in the Highline Aquifer. While nearly all of SPU's raw drinking water comes from its two municipal watersheds, it has access to groundwater from Riverton Heights for seasonal and emergency use. These WHPA are shown on **Exhibit 3-18** through **Exhibit 3-21**.

[43] https://www.nps.gov/orgs/1912/plan-your-visit.htm, accessed 8/9/2023.
[44] South King County Ground Water Management Plan, 2003, page ES-2. https://your.kingcounty.gov/dnrp/library/1997/kcr148.pdf

EXHIBIT 3-22: 100-YEAR AND 500-YEAR FLOODPLAINS WITHIN THE GSA



Source: FIRM panels (all effective 8/19/2020): 53033C0954G, 53033C0955G, 53033C0960G, 53033C0962G, 53033C0966G

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4 Environmental Consequences

The potential environmental effects resulting from implementation of Alternative 1: No Action (No Action), Alternative 2: Proposed Action (Proposed Action) or Alternative 3: Hybrid Terminal Option (Hybrid Terminal Option) at SEA are presented in this chapter in accordance with FAA Order 1050.1F. The analysis presented in this chapter includes considerations of reasonably foreseeable direct and indirect impacts and their significance, as well as possible conflicts with the objectives of federal, regional, state, tribal, and local land use plans, policies, and controls for the GSA. This chapter also presents a discussion of mitigation required, as well as minimization measures the Port would implement to reduce potential impacts.

4.1 Analysis Years

For the assessment of potential operational impacts, the Action Alternatives (Proposed Action and Hybrid Terminal Option) were compared to the No Action for 2032 conditions. The year 2032 was selected as the evaluation period for this EA because it represents the year when most, if not all, of the elements of the Proposed Action would be substantially complete and operational if construction begins in late 2025. FAA Order 1050.1F also suggests conducting analysis of noise impacts for an out-year to understand the potential impacts associated with growth in activity after implementation. For this EA, the FAA has selected 2037 as the out-year, which is used for the evaluation of the out-year impacts for Air Quality, GHG, Noise, and Surface Transportation. Finally, the interim years of 2025 through 2032 were assessed for potential construction related impacts.

Table 4-1 lists the aircraft operations and passengers assumed under each alternative for 2032 and 2037. These aircraft operations and passenger levels were used for the assessment of environmental impacts that are driven by the numbers of future aircraft operations and passengers (such as air quality, GHG, energy supply, noise, solid waste, and surface transportation). For more information on forecasted aircraft operations and passengers see **Appendix A**.[45]

TABLE 4-1: FORECASTED AIRCRAFT OPERATIONS AND PASSENGERS BY ALTERNATIVE

Alternative	Aircraft Operations (2032)	Passengers (2032)	Aircraft Operations (2037)	Passengers (2037)
1: No Action	466,900	57,171,652	474,874	59,483,817
2: Proposed Action	475,655	58,294,388	509,892	64,093,412
3: Hybrid Terminal Option	475,655	58,294,388	509,892	64,093,412

Source: Forecast Update and Constrained Operating Growth Scenario Analysis, Port of Seattle, 2023.

4.2 Environmental Resources Not Affected

As discussed in Chapter 3, Farmlands and Wild and Scenic Rivers are not present within the GSA and therefore would not be impacted by any of the alternatives. These two categories will not be discussed further.

[45] 56 MAP was identified as the benchmark for what the Airport could serve at an optimal level of service within existing airspace, airfield, and cost constraints, however higher forecasted passenger levels were used to evaluate impacts from operations, given the projected growth under constrained operating conditions. See further explanation in Appendix A.

4.3 Environmental Impacts and Mitigation

The following sections describe the potential environmental impacts and mitigation (if warranted) for each of the environmental resource categories where potential impacts may occur. **Table 4-2** provides a summary of the potential environmental impacts, significance determination, and mitigation commitments (if warranted) by resource category.

TABLE 4-2: SUMMARY OF POTENTIAL REASONABLY FORESEEABLE ENVIRONMENTAL IMPACTS

Resource Category	Alternative 1: No Action	Alternative 2: Proposed Action (compared to No Action)	Alternative 3: Hybrid Terminal Option (compared to No Action)	Mitigation
Air Quality	Emissions of criteria pollutants would occur in 2032 and 2037 due to aircraft activity, GSE usage, stationary sources, and motor vehicles.	Includes both construction emissions and operational emissions. In 2032 and 2037 criteria pollutants would increase compared to the No Action. However, those increases are not considered significant.	Construction related emissions would be slightly higher than the Proposed Action. Operational emissions would be the same as the Proposed Action.	None
Biological Resources	No new impacts.	No construction effects to federally-listed threatened or endangered species or their habitat. Indirect effects may occur but would likely not be adverse impacts to Chinook salmon, Steelhead, Bull trout, Bocaccio rockfish, Yelloweye rockfish, Killer whale and their critical habitat due to operational stormwater runoff and industrial wastewater discharges generated. Approximately 56.4 acres of potential habitat for non-listed species and migratory birds would be impacted. However, these impacts are not considered significant.	Same as Proposed Action.	Stormwater-related impacts would be mitigated with post-construction stormwater quantity and quality controls in accordance with applicable regulatory requirements. Any activity during nesting season requires the construction area to be checked for active nests prior to construction. If nests are identified, a buffer would be established until the birds vacate the nest.

TABLE 4-2: SUMMARY OF POTENTIAL REASONABLY FORESEEABLE ENVIRONMENTAL IMPACTS (CONTINUED)

Resource Category	Alternative 1: No Action	Alternative 2: Proposed Action (compared to No Action)	Alternative 3: Hybrid Terminal Option (compared to No Action)	Mitigation
GHG Emissions	Emissions of GHGs would occur in 2032 and 2037 due to aircraft activity, GSE usage, stationary sources, and motor vehicles.	Includes both construction and operational GHG emissions. In 2032 and 2037 GHG emissions would increase compared to the No Action due to additional aircraft activity, GSE usage, stationary sources, and motor vehicles.	Construction related emissions would be slightly higher than the Proposed Action. Operational emissions would be the same as the Proposed Action.	None
Coastal Resources	No new impacts.	Relocation of FAA-owned equipment and associated infrastructure projects would not affect the coastal resources. If any NTPs trigger the need for individual Section 404 / 401 permits, then SEA will be responsible to submit a Consistency Certification form as part of the permit process.	Same as Proposed Action.	None
Department of Transportation Act Section 4(f)	No new impacts.	Would not result in a use (permanent, temporary, or constructive) of a Section 4(f) resource.	Same as Proposed Action.	None

TABLE 4-2: SUMMARY OF POTENTIAL REASONABLY FORESEEABLE ENVIRONMENTAL IMPACTS (CONTINUED)

Resource Category	Alternative 1: No Action	Alternative 2: Proposed Action (compared to No Action)	Alternative 3: Hybrid Terminal Option (compared to No Action)	Mitigation
Hazardous Materials, Solid Waste, and Pollution Prevention	No new impacts to / from hazardous materials. Solid waste would continue to be generated from the terminal, flights, and passengers. There is landfill capacity in the region to accommodate the waste.	Would impact contaminated areas and includes demolition of buildings that have hazardous materials. The Port would handle all hazardous materials consistent with applicable laws and regulations. As a result, no significant impacts are anticipated. Additional solid waste would be generated from the construction and operation of the NTPs when compared to the No Action. No significant impacts related to solid waste are anticipated because there is landfill capacity in the region to accommodate the additional waste.	Same as Proposed Action.	Material will be tested prior to disposal. Hazardous materials will be disposed of according, but not limited, to the following regulations and / or construction protocols during construction: • USEPA's RCRA • Washington's Dangerous Waste Regulations • WSDE's MTCA cleanup levels • The Port's Environmental Agent Work Plan • Sea-Tac Airport Construction Safety Manual • Sea-Tac Airport Construction General Requirements

TABLE 4-2: SUMMARY OF POTENTIAL REASONABLY FORESEEABLE ENVIRONMENTAL IMPACTS (CONTINUED)

Resource Category	Alternative 1: No Action	Alternative 2: Proposed Action (compared to No Action)	Alternative 3: Hybrid Terminal Option (compared to No Action)	Mitigation
Historical, Architectural, Archaeological, and Cultural Resources	No new impacts.	The FAA has determined that there would be No Adverse Effect to any eligible historical, architectural, archaeological, or cultural resources. Therefore, no significant impacts would occur.	Same as Proposed Action.	Inadvertent Discovery Plan for all NTP sites. An archaeological monitor on-site during ground disturbing activities for C03, S10, T02, L03, L05, L07,and the southern half of C02.
Land Use	No new impacts.	Would be consistent with all Airport and local jurisdiction planning documents and would not significantly alter the general land use patterns in the area. Therefore, no significant land use impacts would result.	Same as Proposed Action.	None
Natural Resources and Energy Supply	Energy (electricity, natural gas, and fuel), as well as other natural resources for maintaining facilities would continue to be consumed. SEA would have inadequate jet fuel storage volume required to meet minimum storage levels per the Fuel Consortium's standards / policies.	Would increase demand for energy due to the increase in aircraft activity, passengers, employees, and facilities as compared to the No Action. Natural resources for construction (asphalt, water, etc.) would also increase. However, these increases in demand are not considered significant impacts because the energy sources and materials are not in short supply in the region.	Same as Proposed Action.	None

TABLE 4-2: SUMMARY OF POTENTIAL REASONABLY FORESEEABLE ENVIRONMENTAL IMPACTS (CONTINUED)

Resource Category	Alternative 1: No Action	Alternative 2: Proposed Action (compared to No Action)	Alternative 3: Hybrid Terminal Option (compared to No Action)	Mitigation
Noise and Noise-Compatible Land Use	Aircraft noise would continue to occur due to the aircraft activity at SEA.	In 2032 and 2037, the 65 DNL noise contour for the Proposed Action would be larger than the 2032 and 2037 No Action, respectively, and more people and noise sensitive facilities would be exposed to 65 DNL noise levels. However, no areas of 1.5 DNL increase would occur over a noise sensitive area within the 65 DNL when compared to the No Action in 2032 or 2037. Therefore, no significant noise impacts would occur. The noise contours for each alternative are smaller in 2037 than 2032 due to the increase in the Boeing 737-7/8/9 MAX aircraft which are quieter than the aircraft they are replacing.	Same as Proposed Action.	None

TABLE 4-2: SUMMARY OF POTENTIAL REASONABLY FORESEEABLE ENVIRONMENTAL IMPACTS (CONTINUED)

Resource Category	Alternative 1: No Action	Alternative 2: Proposed Action (compared to No Action)	Alternative 3: Hybrid Terminal Option (compared to No Action)	Mitigation
Socioeconomic and Children's Environmental Health and Safety Risks	Socioeconomic Would not support the long-term economic growth of the region as much as the Proposed Action and would limit the economic benefits to businesses on or near SEA, and for the entire Puget Sound region. Children's Health No impacts to children's health and safety risks would result.	Socioeconomic Two business (Doug Fox Lot and PACCAR Aviation) and one intersection (24th Avenue South from S. 150th Street) would be closed. No adverse impacts to economic resources are expected. Children's Health No impacts to children's health and safety risks would result.	Same as the Proposed Action.	None
Surface Transportation	In 2032 / 2037, 10 roadway intersections would fail to meet mobility standards. These degradations would be due to background growth in traffic and / or travel pattern changes unrelated to the Proposed Action.	In 2032 / 2037, 26 roadway intersections would be impacted (all of which could be mitigated). With implementation of mitigation, these are not considered significant impacts.	Same as the Proposed Action.	Mitigation includes bringing the impacted traffic intersections in line with the mobility standards and may include installation of traffic signals, intersection approach modifications, and the addition of turn lanes. Proportionate share payments of improvement costs equal to percentage of total intersection trips generated by NTPs to jurisdictions.
Visual Effects	No new impacts.	Would result in new sources of light emissions and visual elements; however, the changes would not result in significant impacts.	Same as Proposed Action.	None

TABLE 4-2: SUMMARY OF POTENTIAL REASONABLY FORESEEABLE ENVIRONMENTAL IMPACTS (CONTINUED)

Resource Category	Alternative 1: No Action	Alternative 2: Proposed Action (compared to No Action)	Alternative 3: Hybrid Terminal Option (compared to No Action)	Mitigation
Water Resources	No new impacts.	Would permanently impact jurisdictional wetlands and wetland buffers. Temporary construction impacts to wetlands and wetland buffers would also occur. The Proposed Action would permanently impact streams, potentially jurisdictional ditches, and stream buffers. Temporary construction impacts to streams and stream buffers would also occur. Stormwater runoff would increase due to the increase in impervious surface from the Proposed Action. Would not result in an exceedance of water quality standards, contamination of public drinking water supplies, exceedance of groundwater quality standards, or contamination of an aquifer used for public water supply. No impacts to floodplains are anticipated. Given the regulatory and permitting opportunities to address these impacts, no significant water resource impacts are anticipated.	Same as Proposed Action.	Wetland, stream, and buffer impacts would be mitigated in accordance with applicable federal and state requirements and guidelines. Stormwater-related impacts would be mitigated with post-construction stormwater quantity and quality controls in accordance with applicable regulatory requirements.

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4.3.1 Air Quality

This section presents the results of the air quality analysis of the potential reasonably foreseeable direct and indirect impacts from the Proposed Action and alternatives. The preliminary construction phasing schedule, the assumptions of on-road surface transportation and non-road construction vehicles, the emission factors, and details on the air quality analysis are provided in **Appendix C**.

4.3.1.1 Significant Impact Threshold

As described in FAA Order 1050.1F, a project is considered to have a significant air quality impact if "[t]he action would cause pollutant concentrations to exceed one or more of the NAAQS, as established by the USEPA under the CAA, for any of the time periods analyzed, or to increase the frequency or severity of any such existing violations." As discussed in Chapter 3, SEA is located within an attainment area for all pollutants, which means that the region meets all NAAQS.

An emissions inventory is a summary in tons per year of the total pollutants generated by an alternative. Pollutant concentrations in the NAAQS are measured in micrograms per cubic meter or parts per million / billion and describe concentrations of the pollutants in the air. An emissions inventory is not directly comparable to the NAAQS.

4.3.1.2 Criteria Pollutants

The air quality analysis included criteria air pollutants CO, NO_2, PM_{10}, $PM_{2.5}$, SO_2 and ozone precursor pollutants NO_x and VOCs.

4.3.1.3 Construction Emissions Inventories

Construction activities can result in temporary air quality emissions. On-road construction vehicle emissions were estimated using USEPA MOVES4. For non-road construction equipment Airport Construction Emissions Inventory Tool (ACEIT) was used to identify equipment and USEPA's MOVES4 was used to estimate emissions.

Alternative 1: No Action

The No Action Alternative is not anticipated to result in project-related construction emissions.

Alternative 2: Proposed Action

Table 4-3 provides the construction emissions inventory for the Proposed Action. Peak construction emissions are expected to occur in 2028 for NO_x (40 short tons) and 2029 for CO (239 short tons).

TABLE 4-3: CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (IN SHORT TONS)

Year	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$
2025	17	1	8	0	8	1
2026	124	3	24	0	8	2
2027	204	4	36	0	9	2
2028	214	5	40	0	9	2
2029	239	5	36	0	9	2
2030	181	3	24	0	8	2
2031	143	2	18	0	8	1
2032	40	1	9	0	8	1

Source: Port of Seattle and L&B, 2024.

Alternative 3: Hybrid Terminal Option

Table 4-4 provides the construction emissions inventory for the Hybrid Terminal Option. Peak construction emissions are expected to occur in 2028 for NO_x (47 short tons) and 2029 for CO (242 short tons) and would be equal to or slightly greater than the Proposed Action due to changes to the phasing schedule and the additional elements that must be constructed such as the proposed connection to Concourse D.

TABLE 4-4: CONSTRUCTION EMISSIONS INVENTORY–HYBRID TERMINAL OPTION (IN SHORT TONS)

Year	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$
2025	17	1	8	0	8	1
2026	124	3	24	0	8	2
2027	201	5	39	0	9	2
2028	211	5	47	0	10	3
2029	242	5	44	0	9	3
2030	188	4	37	0	9	2
2031	149	3	31	0	9	2
2032	42	1	15	0	8	1

Note: Minor differences from the Proposed Action may not be evident due to rounding and the number of significant digits displayed.
Source: Port of Seattle and L&B, 2024.

4.3.1.4 Operational Emissions Inventories (2032 and 2037)

Aircraft, GSE and stationary source emissions were evaluated using the FAA's AEDT Version 3f. Emissions from motor vehicles were evaluated using USEPA's MOVES4.

Alternative 1: No Action

Table 4-5 and **Table 4-6** provide the results of the operational emissions inventories for the Future (2032) and (2037) No Action Alternative. For all pollutants, aircraft operations are the highest source of emissions. For most pollutants, motor vehicles represent the second highest source of emissions. For aircraft, the decrease in CO and increase in NO_x is due to phasing-out of the Boeing 737-700/800/900 aircraft and the phasing-in of the 737-7/8/9 MAX aircraft from 2032 to 2037. There is an anticipated decrease in emissions for motor vehicles between 2032 and 2037 due to expected improvements in motor vehicle emissions.

TABLE 4-5: EMISSIONS INVENTORY – FUTURE (2032) NO ACTION ALTERNATIVE (IN SHORT TONS)

Emission Source	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Aircraft	**2,152**	**249**	**2,761**	**236**	**27**	**27**
LTO (includes Start-Up, Approach, Climb, and Taxiing)	2,042	233	2,631	222	14	14
APUs	109	16	73	11	13	13
Aircraft Run-Ups	1	0	57	2	0	0
GSE	**190**	**6**	**14**	**0**	**1**	**1**
Tenant-Owned GSE	187	6	9	0	1	0
Port-Owned Airfield Vehicles and Equipment	3	0	4	0	0	0
Stationary Sources	**16**	**11**	**27**	**37**	**1**	**1**
Natural Gas Boilers and Heaters	13	1	16	0	0	0
Diesel Generators	2	0	11	37	0	0
Fuel Farm Tanks	0	10	0	0	0	0
Motor Vehicles	**2,089**	**18**	**122**	**2**	**4**	**3**
Parking Facilities	35	1	3	0	0	0
On and Off-Airport Roadways (includes Airside Deliveries)	2,054	17	119	2	4	3
Total	***4,447***	***283***	***2,923***	***275***	***32***	***32***

Note: Totals may not sum due to rounding.
Source: Port of Seattle and L&B, 2024.

TABLE 4-6: EMISSIONS INVENTORY – FUTURE (2037) NO ACTION ALTERNATIVE (IN SHORT TONS)

Emission Source	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Aircraft	**2,089**	**238**	**2,975**	**242**	**29**	**29**
LTO (includes Start-Up, Approach, Climb, and Taxiing)	1,972	222	2,842	227	13	13
APUs	117	16	77	12	15	15
Aircraft Run-Ups	1	0	56	2	0	0
GSE	**194**	**6**	**13**	**0**	**1**	**1**
Tenant-Owned GSE	191	6	9	0	0	0
Port-Owned Airfield Vehicles and Equipment	3	0	4	0	0	0
Stationary Sources	**16**	**11**	**27**	**37**	**1**	**1**
Natural Gas Boilers and Heaters	13	1	16	0	0	0
Diesel Generators	2	0	11	37	0	0
Fuel Farm Tanks	0	10	0	0	0	0
Motor Vehicles	**1,682**	**14**	**72**	**2**	**2**	**2**
Parking Facilities	27	1	2	0	0	0
On and Off-Airport Roadways (includes Airside Deliveries)	1,655	13	71	2	2	2
Total	***3,982***	***268***	***3,088***	***281***	***32***	***32***

Note: Totals may not sum due to rounding.
Source: Port of Seattle and L&B, 2024.

Alternative 2: Proposed Action

Table 4-7 and **Table 4-8** provides the operational emissions inventory for the Future (2032) and (2037) Proposed Action. For all pollutants, aircraft operations are the highest source of emissions. For most

pollutants, motor vehicles represent the second highest source of emissions. For aircraft, the increase in emissions is due to the increase in operations and taxi times and phasing-out of the Boeing 737-700/800/900 aircraft and the phasing-in of the 737-7/8/9 MAX aircraft. There is an anticipated decrease in emissions for motor vehicles, between 2032 and 2037, due to expected improvements in motor vehicle emissions.

TABLE 4-7: EMISSIONS INVENTORY – FUTURE (2032) PROPOSED ACTION (IN SHORT TONS)

Emission Source	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Aircraft	**2,166**	**251**	**2,807**	**239**	**28**	**28**
LTO (includes Start-Up, Approach, Climb, and Taxiing)	2,054	235	2,675	225	14	14
APUs	111	16	74	11	13	13
Aircraft Run-Ups	1	0	58	2	0	0
GSE	**194**	**6**	**14**	**0**	**1**	**1**
Tenant-Owned GSE	191	6	9	0	1	0
Port-Owned Airfield Vehicles and Equipment	3	0	4	0	0	0
Stationary Sources	**23**	**15**	**39**	**54**	**1**	**1**
Natural Gas Boilers and Heaters	19	1	23	0	0	0
Diesel Generators	4	0	16	54	0	0
Fuel Farm Tanks	0	13	0	0	0	0
Motor Vehicles	**2,135**	**18**	**124**	**2**	**4**	**3**
Parking Facilities	39	1	3	0	0	0
On and Off-Airport Roadways (includes Airside Deliveries)	2,096	17	121	2	4	3
Total	***4,517***	***290***	***2,984***	***295***	***33***	***33***

Note: Totals may not sum due to rounding.
Source: Port of Seattle and L&B, 2024.

TABLE 4-8: EMISSIONS INVENTORY – FUTURE (2037) PROPOSED ACTION (IN SHORT TONS)

Emission Source	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Aircraft	**2,231**	**252**	**3,184**	**259**	**31**	**31**
LTO (includes Start-Up, Approach, Climb, and Taxiing)	2,104	235	3,041	243	14	14
APUs	126	17	82	13	16	16
Aircraft Run-Ups	1	0	60	2	0	0
GSE	**208**	**6**	**14**	**0**	**1**	**1**
Tenant-Owned GSE	204	6	10	0	1	0
Port-Owned Airfield Vehicles and Equipment	3	0	5	0	0	0
Stationary Sources	**23**	**15**	**39**	**54**	**1**	**1**
Natural Gas Boilers and Heaters	19	1	23	0	0	0
Diesel Generators	4	0	16	54	0	0
Fuel Farm Tanks	0	13	0	0	0	0
Motor Vehicles	**1,784**	**14**	**76**	**2**	**2**	**2**
Parking Facilities	32	1	2	0	0	0
On and Off-Airport Roadways (includes Airside Deliveries)	1,752	14	74	2	2	2
Total	***4,245***	***288***	***3,314***	***315***	***35***	***34***

Note: Totals may not sum due to rounding.
Source: Port of Seattle and L&B, 2024.

The results of the comparison between the Future (2032 and 2037) Proposed Action and the Future (2032 and 2037) No Action Alternative are shown in **Table 4-9**. Emissions of all pollutants are expected to be greater with the Future (2032 and 2037) Proposed Action than the Future (2032 and 2037) No Action due to the increased aircraft operations, taxi times, and motor vehicles.

Of the project pollutant increases, the largest increase would be to CO and NO_x. Based on coordination with the PSCAA, the potential increase in criteria pollutant emissions, as shown in the emissions inventory for the Proposed Action compared to the No Action Alternative, would not be expected to create any new violation of the NAAQS.[46]

TABLE 4-9: SUMMARY OF ANNUAL CRITERIA POLLUTANT EMISSIONS, PROPOSED ACTION COMPARED TO THE NO ACTION ALTERNATIVE 2032 AND 2037 (IN SHORT TONS)

Emission Source	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$
2032 No Action Alternative	4,447	283	2,923	275	32	32
2032 Proposed Action (Construction & Operational)	4,557	291	2,993	295	41	34
2032 Proposed Action (Construction)	*40*	*1*	*9*	*0*	*8*	*1*
2032 Proposed Action (Operational)	*4,517*	*290*	*2,984*	*295*	*33*	*33*
2032 Increase in Emissions	***110***	***8***	***70***	***20***	***9***	***2***
2037 No Action Alternative	3,982	268	3,088	281	32	32
2037 Proposed Action (Operational Only)	4,245	288	3,314	315	35	34
2037 Increase in Emissions	***263***	***20***	***225***	***34***	***3***	***2***

Note: Totals may not sum due to rounding.
Source: Port of Seattle and L&B, 2024.

Alternative 3: Hybrid Terminal Option

The Hybrid Terminal Option would have the same operational emissions as the Proposed Action because the number of future aircraft operations and operational assumptions would be the same. The only difference would be related to construction emissions. As discussed under the Proposed Action, the potential increase in criteria pollutant emissions, as shown in the emissions inventory for the Hybrid Terminal Option as compared to the No Action Alternative, is not expected to create any new violation of the NAAQS. The results of the comparison between the Future (2032 and 2037) Hybrid Option and the Future (2032 and 2037) No Action Alternative are shown in **Table 4-10**.

TABLE 4-10: SUMMARY OF ANNUAL CRITERIA POLLUTANT EMISSIONS, HYBRID OPTION COMPARED TO THE NO ACTION ALTERNATIVE 2032 AND 2037 (IN SHORT TONS)

Emission Source	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$
2032 No Action Alternative	4,447	283	2,923	275	32	32
2032 Hybrid Terminal Option	4,559	291	2,999	295	41	34
2032 Hybrid Terminal Option (*Construction)*	*42*	*1*	*15*	*0*	*8*	*1*
2032 Hybrid Terminal Option (*Operational)*	*4,517*	*290*	*2,984*	*295*	*33*	*33*
2032 Increase in Emissions	***112***	***8***	***76***	***20***	***9***	***2***
2037 No Action Alternative	3,982	268	3,088	281	32	32
2037 Hybrid Terminal Option (Operational Only)	4,245	288	3,314	315	35	34
2037 Increase in Emissions	***263***	***20***	***225***	***34***	***3***	***2***

Note: Totals may not sum due to rounding.
Source: Port of Seattle and L&B, 2024.

[46] Erik Saganić, PSCAA, Email to Kandice Krull, FAA, RE: Sea-Tac International Airport Preliminary Air Results, December 14, 2023.

Mitigation and Minimization Measures

Mitigation

Because no significant impacts related to air quality were identified, no mitigation would be necessary.

Minimization Measures

Minimization measures and best management practices (BMPs) would be used to minimize air quality impacts during construction. The Port would adhere to FAA AC 150/5370-10H, *Standard Specifications for Construction of Airports*.

4.3.2 Biological Resources

This section presents the analysis of potential reasonably foreseeable impacts to biological resources for the Proposed Action and alternatives. More information regarding the species identified and analysis of impacts can be found in **Appendix D**.

4.3.2.1 Significant Impact Threshold

Significant impacts to biological resources include actions where the USFWS or the NMFS determine that the action would likely:

- Jeopardize the continued existence of a federally-listed threatened or endangered species or
- Result in the destruction or adverse modification of federally designated critical habitat.

The FAA has not established a significance threshold for non-listed species, but they have identified factors to consider when evaluating potential environmental impacts to biological resources. If these factors exist, there is not necessarily a significant impact; rather, the FAA must evaluate these factors in light of context and intensity to determine if there are significant impacts. These factors to consider when evaluating impacts to biological resources include:

- Long-term or permanent loss of unlisted plant or wildlife species;
- Adverse impacts to special status species (e.g., state species of concern, species proposed for listing, migratory birds, bald and golden eagles) or their habitats;
- Substantial loss, reduction, degradation, disturbance, or fragmentation of native species' habitats or their populations; or
- Adverse impacts on a species' reproductive success rates, natural mortality rates, non-natural mortality, or ability to sustain the minimum population levels required for population maintenance.

Trees and vegetation in the GSA are not federally regulated resources. Special status wildlife and plant species are discussed in **Appendix D**.

4.3.2.2 Fish and Wildlife

Alternative 1: No Action

The No Action Alternative does not include any changes to the biological environment. However, the No Action Alternative would have treated stormwater runoff so it may affect not likely to adversely affect ESA-listed species or their habitat.

Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

A Biological Evaluation (BE) was prepared to evaluate the Proposed Action's potential effects on ESA-listed species and critical habitats that potentially occur in the ESA Study Area.

The FAA determined the Action Alternatives would not result in direct effects on ESA-listed species or critical habitat. Indirect effects could result from delayed consequences associated with operational

treated stormwater runoff and industrial wastewater discharges generated by the Action Alternatives but would likely not adversely affect ESA-listed species. **Table 4-11** summarizes the species evaluated in the BE and effects determinations for each species and critical habitat.

TABLE 4-11: EFFECTS DETERMINATIONS FOR ESA-LISTED SPECIES AND DESIGNATED CRITICAL HABITAT

Species / Habitat	Effects Determination
Bocaccio rockfish (Sebastes paucispinus, Puget Sound / Georgia Basin DPS) and critical habitat	May affect, not likely to adversely affect*
Bull trout (Salvelinus confluentus, Coastal-Puget Sound DPS) and critical habitat	May affect, not likely to adversely affect
Central America / Western North Pacific Humpback Whale (Megaptera novaeangliae)	No effect
Chinook salmon (Oncorhynchus tshawytscha, Puget Sound ESU) and critical habitat	May affect, not likely to adversely affect*
Killer whale (Orcinus orca, Southern Resident DPS) and critical habitat	May affect, not likely to adversely affect*
Marbled murrelet (Brachyramphus mamoratus)	No effect
Monarch butterfly (Danaus Plexippus)	No effect
North American wolverine (Gulo gulo luscus)	No effect
Northwestern pond turtle (Actinemys marmorata)	No effect
Southern green sturgeon (Acipenser medirostris)	No effect
Southern Pacific eulachon (Thaleichthys pacificus)	No effect
Steelhead (O. mykiss, Puget Sound ESU)	May affect, not likely to adversely affect*
Steelhead critical habitat	No effect
Suckley's Cuckoo Bumble Bee (Bombus suckleyi)	No effect
Yellow-billed cuckoo (Coccyzus americanus)	No effect
Yelloweye rockfish (S. ruberrimus, Puget Sound / Georgia Basin DPS) and critical habitat	May affect, not likely to adversely affect*

* In its July 28, 2025 Biological Opinion, NMFS concluded that the effects for these species were "Likely to adversely affect (LAA)." In addition, NMFS concluded the Action Alternatives would also LAA the Sunflower Sea Star (proposed for listing 88 FR 16212).

DPS = Distinct population segment; ESU = Evolutionarily significant unit
Source: US Department of Transportation, Federal Aviation Administration, Northwest Mountain Region – Seattle Airports District Office, 2025. Seattle-Tacoma International Airport Sustainable Airport Master Plan Near-Term Projects: Final Biological Evaluation. Prepared, by Kandice Krull, Environmental Protection Specialist.

The Action Alternatives were also evaluated for potential effects on essential fish habitat (EFH). It was determined that the Action Alternatives may affect, but are not likely to adversely affect, EFH for groundfish, coastal pelagic, and Pacific salmon species in Puget Sound and EFH for Pacific salmon species in the Duwamish River and tributaries that drain to Puget Sound from the Airport. Any effect to EFH would result from delayed consequences associated with operational treated stormwater runoff and industrial wastewater discharges that are generated by the Action Alternatives.

FAA sent the request to the NMFS to initiate informal Section 7 and EFH consultation on October 2, 2024 and again on June 30, 2025. NMFS responded by issuing a Biological Opinion on July 28, 2025. FAA sent a request to the USFWS on October 2, 2024 to initiate informal Section 7 consultation and again on June 30, 2025. See **Appendix D** for the BE and consultation with the NMFS and USFWS.

Non-listed species may be impacted by the proposed removal of vegetation and trees that may provide habitat. Approximately 56.4 acres of land that currently has trees, shrubs, and maintained grassy areas would be cleared for the construction of the offsite cargo (C02 and C03), north GT holding lot (L05), employee parking structure (L07), CRDC (S10), and west side maintenance campus (S07). Some common non-listed species may be displaced due to loss of habitat; however, it is likely that these animals would relocate to surrounding areas near North Sea-Tac Park, Tub Lake, and the Miller Creek stream buffer providing similar habitat. For this reason, the reasonably foreseeable impacts to non-listed fish and wildlife species would not be significant.

Mitigation and Minimization Measures

Mitigation

See Section 4.3.14.3, Surface Waters for mitigation measures related to operational treated stormwater runoff and industrial wastewater discharges that will be put in place to mitigate impacts to ESA-listed species.

See Biological Opinion in Appendix D for Reasonable and Prudent Measures and corresponding Terms and Conditions.

Minimization Measures

To minimize impacts, the Port would implement BMPs, such as silt fencing, during construction to protect against sediment and soils entering nearby streams and creeks. The Port would also implement strategies outlined in their April 2024 Land Stewardship Plan.[47] Port-owned properties outside of the Airport Activity Area (AAA) will comply with any appropriate city standards.

4.3.2.3 Migratory Birds

Alternative 1: No Action

The No Action Alternative would not cause new impacts to migratory birds. The Port would continue its policies and protocols for minimizing wildlife hazards, including bird strikes, in accordance with FAA and United States Department of Agriculture guidelines.

Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

The Action Alternatives include removal of vegetation and trees that may provide nesting locations for migratory birds. However, the areas around these two sites provide similar vegetation and trees for migratory birds to utilize. Given the availability of alternate sites and the ability to meet the MBTA requirements, the Action Alternatives would not result in a significant impact to migratory birds protected by the MBTA. No impacts to bald eagles or golden eagles regulated under the BGPA are anticipated, because no nests or roosting sites have been documented within the GSA.

[47] https://www.airportprojects.net/sampenvironmentalreview/tree-replacement-standards/. These standards established voluntary goals to protect and restore healthy trees, forest, and other habitat, and connect and expand existing habitat areas, among other goals.

Mitigation and Minimization Measures

Mitigation

No direct impacts to MBTA species are anticipated and as a result, no mitigation specific to MBTA-listed species is necessary. To comply with the MBTA, a pre-construction nest survey will be conducted by a qualified biologist 7-10 days before the start of construction and follow King County development standards for migratory birds.[48] Airport personnel will be notified of the breeding season and advised not to disturb nests during future maintenance activities. If nests are found, BMPs will be used to develop measures to prevent disturbing nests, such as instituting a 100-foot buffer around the nests and / or timing restrictions.

Minimization Measures

The Port would draw upon the USFWS' Nationwide Standard Conservation Measures,[49] as well as other measures designed to protect birds and their resources.

4.3.3 Greenhouse Gas Emissions

This section provides the estimate of GHG emissions attributable to construction and operational emissions due to the Proposed Action and alternatives. **Appendix C** contains detailed information on the GHG emissions inventories. After the publication of the draft EA, EO 13990, which was relied upon for the January 2023 CEQ draft GHG guidance, was revoked. In addition, CEQ revoked its regulations (40 CFR parts 1500-1508) implementing NEPA, 42 U.S.C. 4321 *et seq.,* as amended, in response to Executive Order 14154. As a result of these changes, all references to climate and the qualitative climate evaluation that discussed the level of preparedness with respect to the impacts of climate change, the extent to which the alternatives could be affected by future climate conditions, and if the alternatives are consistent with national, state, and local climate goals were removed from the final EA.

4.3.3.1 Significant Impact Threshold

The FAA has not established a significance threshold for GHG. There are currently no accepted methods of determining significance applicable to aviation projects.

4.3.3.2 Construction GHG Emissions Inventories

The GHG construction emissions inventories were prepared using the same data, assumptions, and models as developed for the air quality criteria pollutant construction emissions inventories.

Alternative 1: No Action

No project-related construction activity or emissions would occur in the No Action Alternative.

Alternative 2: Proposed Action

Table 4-12 provides the construction GHG emissions inventory for the Proposed Action. As the table shows, peak construction GHG emissions are expected to occur in 2028, which is the year with the most anticipated construction activity and would produce 44,111 MT of CO_2e that year.

[48] KCC 21A.24.382, June 4, 2024, contains standards for migratory birds and time periods when certain construction activities can occur for bird species. (included in Appendix D).
[49] https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf, accessed January 2024.

TABLE 4-12: CONSTRUCTION GHG EMISSIONS INVENTORY – PROPOSED ACTION (CO_2E MT PER YEAR)

Year	CO_2	CH_4	N_2O	Total
2025	6,055	2	16	6,073
2026	25,761	14	79	25,854
2027	40,154	22	114	40,290
2028	43,967	23	121	44,111
2029	41,593	25	105	41,722
2030	29,633	19	73	29,725
2031	22,899	15	58	22,972
2032	8,458	5	20	8,482

Note: Totals may not sum due to rounding.
Source: Port of Seattle and L&B, 2024.

Alternative 3 - Hybrid Terminal Option

Table 4-13 provides the construction GHG emissions inventory for the Hybrid Terminal Option. Peak construction GHG emissions are expected to occur in 2029 and produce 48,347 MT of CO_2e. In 2025 and 2026, there is no difference in GHG construction emissions between the Action Alternatives. From 2027 through 2032, the Hybrid Terminal Option results in greater GHG emissions than the Proposed Action due to the change in construction phasing and the additional elements that must be constructed such as the connection to Concourse D.

TABLE 4-13: CONSTRUCTION GHG EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CO_2E MT PER YEAR)

Year	CO_2	CH_4	N_2O	Total
2025	6,055	2	16	6,073
2026	25,761	14	79	25,854
2027	41,730	22	111	41,862
2028	48,048	24	118	48,191
2029	48,211	26	109	48,347
2030	39,235	21	81	39,337
2031	32,633	17	65	32,715
2032	12,362	5	22	12,390

Note: Totals may not sum due to rounding.
Source: Port of Seattle and L&B, 2024.

4.3.3.3 Operational GHG Emissions Inventories (2032 and 2037)

The data and assumptions developed for the air quality criteria pollutant emissions inventory were used to prepare the GHG emissions inventory. The GHG emission inventories utilized fuel dispensed to model operations (including start-up, approach, climb, and taxiing), APUs, and aircraft run-up emissions. Emissions factors from MOVES4, USEPA GHG Emission Factors Hub, and Port electricity providers were used to develop the operational GHG emissions inventory. The operational emissions inventories address GHG emissions associated with aircraft operations, GSE, stationary sources, and motor vehicle traffic for 2032 and 2037. For the future Proposed Action and Hybrid Terminal Option alternatives, the operating condition reflects completion of the project.

Alternative 1: No Action

Table 4-14 and **Table 4-15** provide the estimated annual rate (MT per year) of operational GHG emissions for the Future (2032) and (2037) No Action Alternative.

TABLE 4-14: ANNUAL OPERATIONAL GHG EMISSIONS INVENTORY – FUTURE (2032) NO ACTION ALTERNATIVE (CO_2E MT PER YEAR)

Emissions Source	CO_2	CH_4	N_2O	Total
Scope 1				
Port-Owned Airfield Vehicles / Equipment	4,324	5	0	4,330
Natural Gas Boilers and Heaters	17,627	11	10	17,648
Diesel Generators	327	0	1	328
Fuel Farm Tanks[1]	0	0	0	0
Total - Scope 1	*22,278*	*17*	*11*	*22,306*
Scope 2				
Port of Seattle Electricity Consumption	2,463	0	0	2,463
Total – Scope 2	*2,463*	*0*	*0*	*2,463*
Scope 3				
Aircraft (fuel dispensed)	6,631,793	0	63,977	6,695,771
Tenant-Owned GSE	32,691	47	0	32,737
Tenant Electricity Consumption	330	0	0	330
Airside Deliveries	496	0	12	509
Roadways	408,362	222	4,339	412,923
Parking Facilities	6,786	6	66	6,858
Total - Scope 3	*7,080,457*	*276*	*68,394*	*7,149,127*
Total	***7,105,199***	***293***	***68,405***	***7,173,897***
			CO_2e Total	**7,173,897**

[1] CO_2, CH_4, and N_2O, are by-products of fuel combustion. Per the FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1*, the storage of fuel is a potential source of evaporative hydrocarbons but does not produce the type of hydrocarbons that contribute directly to global climate change.
Note: Totals may not sum due to rounding. Zeros may not indicate an absolute zero value.
Source: Port of Seattle, L&B, 2024.

TABLE 4-15: ANNUAL OPERATIONAL GHG EMISSIONS INVENTORY – FUTURE (2037) NO ACTION ALTERNATIVE (CO_2E MT PER YEAR)

Emissions Source	CO_2	CH_4	N_2O	Total
Scope 1				
Port-Owned Airfield Vehicles / Equipment	4,398	6	0	4,404
Natural Gas Boilers and Heaters	17,627	11	10	17,648
Diesel Generators	327	0	1	328
Fuel Farm Tanks[1]	0	0	0	0
Total - Scope 1	*22,352*	*17*	*11*	*22,380*
Scope 2				
Port of Seattle Electricity Consumption	2,463	0	0	2,463
Total – Scope 2	*2,463*	*0*	*0*	*2,463*
Scope 3				
Aircraft (fuel dispensed)	6,745,055	0	65,070	6,810,125
Tenant-Owned GSE	33,300	48	0	33,347
Tenant Electricity Consumption	330	0	0	330
Airside Deliveries	480	0	12	492
Roadways	412,215	211	4,394	416,820
Parking Facilities	6,669	6	67	6,742
Total - Scope 3	*7,198,049*	*265*	*69,543*	*7,267,857*
Total	***7,222,864***	***283***	***69,554***	***7,292,700***
			CO_2eTotal	**7,292,700**

[1] CO_2, CH_4, and N_2O, are by-products of fuel combustion. Per the FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1*, the storage of fuel is a potential source of evaporative hydrocarbons but does not produce the type of hydrocarbons that contribute directly to global climate change.
Note: Totals may not sum due to rounding. Zeros may not indicate an absolute zero value.
Source: Port of Seattle, L&B, 2024.

Alternative 2: Proposed Action

Table 4-16 and **Table 4-17** provide the operational emissions inventory for the Future (2032) and (2037) Proposed Action.

TABLE 4-16: ANNUAL OPERATIONAL GHG EMISSIONS INVENTORY – FUTURE (2032) PROPOSED ACTION (CO_2E MT PER YEAR)

Emissions Source	CO_2	CH_4	N_2O	Total
Scope 1				
Port-Owned Airfield Vehicles / Equipment	4,405	6	0	4,411
Natural Gas Boilers and Heaters	24,866	16	14	24,896
Diesel Generators	550	1	1	552
Fuel Farm Tanks[1]	0	0	0	0
Total - Scope 1	*29,821*	*22*	*15*	*29,859*
Scope 2				
Port of Seattle Electricity Consumption	3,386	48	0	3,434
Total – Scope 2	*3,386*	*48*	*0*	*3,434*
Scope 3				
Aircraft (fuel dispensed)	6,756,148	0	65,177	6,821,325
Tenant-Owned GSE	33,291	48	0	33,338
Tenant Electricity Consumption	462	6		468
Airside Deliveries	505	0	12	518
Roadways	416,812	227	4,422	421,461
Parking Facilities	7,634	7	74	7,714
Total - Scope 3	*7,214,852*	*287*	*69,685*	*7,284,825*
Total	***7,248,060***	***357***	***69,700***	***7,318,118***
			CO_2eTotal	**7,318,118**

[1] CO_2, CH_4, and N_2O, are by-products of fuel combustion. Per the FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1*, the storage of fuel is a potential source of evaporative hydrocarbons but does not produce the type of hydrocarbons that contribute directly to global climate change.
Note: Totals may not sum due to rounding. Zeros may not indicate an absolute zero value.
Source: Port of Seattle, L&B, 2024.

TABLE 4-17: ANNUAL OPERATIONAL GHG EMISSIONS INVENTORY – FUTURE (2037) PROPOSED ACTION (CO_2E MT PER YEAR)

Emissions Source	CO_2	CH_4	N_2O	Total
Scope 1				
Port-Owned Airfield Vehicles / Equipment	4,722	6	0	4,728
Natural Gas Boilers and Heaters	24,866	16	14	24,896
Diesel Generators	550	1	1	552
Fuel Farm Tanks[1]	0	0	0	0
Total - Scope 1	*30,138*	*23*	*15*	*30,176*
Scope 2				
Port of Seattle Electricity Consumption	3,386	48	0	3,434
Total – Scope 2	*3,386*	*48*	*0*	*3,434*
Scope 3				
Aircraft (fuel dispensed)	7,242,447	0	69,868	7,312,315
Tenant-Owned GSE	35,700	51	0	35,751
Tenant Electricity Consumption	462	6	0	468
Airside Deliveries	515	0	13	529
Roadways	436,738	223	4,644	441,606
Parking Facilities	7,904	7	79	7,990
Total - Scope 3	*7,723,767*	*287*	*74,605*	*7,798,659*
Total	***7,757,291***	***358***	***74,620***	***7,832,269***
			CO_2eTotal	**7,832,269**

[1] CO_2, CH_4, and N_2O, are by-products of fuel combustion. Per the FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1*, the storage of fuel is a potential source of evaporative hydrocarbons but does not produce the type of hydrocarbons that contribute directly to global climate change.
Note: Totals may not sum due to rounding. Zeros may not indicate an absolute zero value
Source: Port of Seattle, L&B, 2024.

Alternative 3: Hybrid Terminal Option

The Future (2032) and (2037) Hybrid Terminal Option would have different construction GHG emissions but the same operational GHG emissions as the Future (2032) and (2037) Proposed Action because number of future aircraft operations would be the same.

Table 4-18 provides a comparison of the operational GHG emissions between the No Action and Proposed Action for 2032 and 2037 conditions. **Table 4-19** provides a comparison of the operational GHG emissions between the No Action and Hybrid Terminal Option for 2032 and 2037 conditions.

TABLE 4-18: SUMMARY OF GHG ANNUAL EMISSIONS, PROPOSED ACTION COMPARED TO THE NO ACTION ALTERNATIVE (CO_2E MT PER YEAR)

Scenario	CO_2	CH_4	N_2O	Total
2032 No Action Alternative	7,105,199	293	68,405	7,173,897
2032 Proposed Action (Construction & Operational)	7,256,518	362	69,720	7,326,600
2032 Proposed Action (Construction)	*8,458*	*5*	*20*	*8,482*
2032 Proposed Action (Operational)	*7,248,060*	*357*	*69,700*	*7,318,118*
2032 Increase in Emissions	***151,319***	***69***	***1,316***	***152,703***
2037 No Action Alternative	7,222,864	283	69,554	7,292,700
2037 Proposed Action (Operational Only)	7,757,291	358	74,620	7,832,269
2037 Increase in Emissions	***534,427***	***75***	***5,066***	***539,569***

Note: Totals may not sum due to rounding.
Source: Port of Seattle and L&B, 2024.

TABLE 4-19: SUMMARY OF GHG ANNUAL EMISSIONS, HYBRID TERMINAL OPTION COMPARED TO THE NO ACTION ALTERNATIVE (CO_2E MT PER YEAR)

Scenario	CO_2	CH_4	N_2O	Total
2032 No Action Alternative	7,105,199	293	68,405	7,173,897
2032 Hybrid Terminal Option (Construction & Operational)	7,260,422	363	69,723	7,330,507
2032 Hybrid Terminal Option (Construction)	*12,362*	*5*	*22*	*12,390*
2032 Hybrid Terminal Option (Operational)	*7,248,060*	*357*	*69,700*	*7,318,118*
2032 Increase in Emissions	***155,223***	***70***	***1,318***	***156,611***
2037 No Action Alternative	7,222,864	283	69,554	7,292,700
2037 Hybrid Terminal Option (Operational Only)	7,757,291	358	74,620	7,832,269
2037 Increase in Emissions	***534,427***	***75***	***5,066***	***539,569***

Note: Totals may not sum due to rounding.
Source: Port of Seattle and L&B, 2024.

The Proposed Action and the Hybrid Terminal Option would increase GHG emissions as compared to the No Action Alternative. The Proposed Action would increase Scope 1, 2 and 3 GHG emissions by 152,703 (2.1 percent) CO_2e MT over the No Action Alternative in 2032 and by 539,569 (7.4 percent) CO_2e MT in 2037. The Hybrid Terminal Option would increase Scope 1, 2 and 3 GHG emissions by 156,611 (2.2 percent) MT over the No Action Alternative in 2032 and by 539,569 MT (7.4 percent) in 2037. The majority of the GHG emissions increase comes from Scope 3 which includes GHG emissions that are not under the direct control of the Port (such as aircraft-related emissions). The analysis did not include the use of SAF or the increase in electric GSE due to limitations in the model. Both of these, as well as other improvements, will help to reduce future GHG emissions.

Mitigation and Minimization Measures

Mitigation

GHG emissions are provided for disclosure purposes only. Therefore, mitigation is not required.

Minimization Measures

Minimization measures and BMPs would be used to minimize GHG emissions during construction. The Port has undertaken a wide range of activities designed to reduce GHG emissions independent of the Proposed Action. Furthermore, the Port is playing a key role in efforts to facilitate the adoption and local production of SAF with airline partners. The Port has set the goal to power every flight fueled at SEA with at least ten percent blend of SAF by 2028.

4.3.4 Coastal Resources

The CZMA requires that "each federal agency activity within or outside the coastal zone that affects any land or water use, or natural resource of the coastal zone shall be carried out in a manner which is consistent, to the maximum extent practicable, with the enforceable policies of approved state management programs."[50] The specific type of federal action determines the appropriate process. Activities undertaken by or for a federal agency follows the process outlined in 15 CFR Part 930 Subpart C. Activities that require a federal license or permit follows the process outline in 15 CFR Part 930 Subpart D. Federal assistance to state or local government agencies for activities that have reasonably foreseeable effects on the resources or uses of the coastal zone may be subject to a federal consistency review.

For federal authorizations listed in the Washington CZMP, a federal agency cannot issue a permit or approval unless WSDE agrees that the project is consistent with Washington's enforceable policies. The FAA is responsible for determining if its project or activity has any reasonably foreseeable direct or indirect effects on Washington's CZMP. The Port is responsible to review projects that will require a federal license or permit for compliance with the CZMP's enforceable policies and prepare a federal Consistency Certification during the permit process.

4.3.4.1 Significant Impact Threshold

The FAA has not established a significance threshold for coastal resources, but they have identified factors to consider when evaluating potential environmental impacts on coastal resources. If these factors exist, there is not necessarily a significant impact; rather, the FAA must evaluate these factors in light of context and intensity to determine if there are significant impacts. Factors to consider include situations in which the proposed action or alternative(s) would have the potential to:

- Be inconsistent with the relevant state CZM plan(s);
- Cause an unacceptable risk to human safety or property; or
- Cause adverse impacts to the coastal environment that cannot be satisfactorily mitigated.

4.3.4.2 Coastal Zone Impacts

Alternative 1: No Action

The No Action Alternative is not anticipated to result in new impacts to coastal resources.

Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

There are currently no listed federal assistance activities in Washinton State's CZMP. Four of the airfield projects (A01, A02, A04, and A06) would require the FAA to relocate FAA-owned equipment (including navigational and visual aids) and associated infrastructure. These relocations may require modifications to existing FAA airspace procedures. The extent of these relocations and modifications would be determined during the design of the airfield projects. Relocations of equipment would occur on the airfield. The FAA has determined that the proposed FAA activities would be undertaken in a manner as to not affect the coastal resources or uses of Washington State coastal zone. The FAA has therefore determined that a Negative Determination is appropriate for the FAA activities. The Negative Determination was submitted to the WSDE Federal Consistency Coordinator on July 2, 2024 (see **Appendix E, Coastal Resources**). WSDE did not have any questions or concerns with the Negative Determination.

[50] 15 CFR Part 930, *Federal Consistency with Approved Coastal Management Programs.*

If any NTPs trigger the need for individual Section 404 / 401 permits, then SEA will be responsible to submit a Consistency Certification form as part of the permit process.

Mitigation and Minimization Measures

Mitigation

Because there would be no significant coastal zone impacts under any of the alternatives considered, no mitigation would be necessary.

Minimization Measures

No minimization measures have been identified.

4.3.5 U.S. Department of Transportation Act, Section 4(f)

This section presents the results of the analysis of potential reasonably foreseeable direct and indirect impacts to Section 4(f) resources as a result of the Proposed Action and alternatives. Resources that are protected by Section 4(f) inside the GSA include 15 publicly-owned parks or recreation areas.

4.3.5.1 Significant Impact Threshold

Table 4-20 presents the definitions of an impact to, or "use of" a Section 4(f) resource.

TABLE 4-20: SECTION 4(F) IMPACT

Impact Type	Definition
Physical Use	Actual physical taking of a Section 4(f) property, through purchase of land or permanent easement, physical occupation of all or a portion of the property, or alteration of structures or facilities located on the property.
Temporary Use	Temporary use of a Section 4(f) resource that is adverse.
Constructive Use	Direct or indirect impacts that substantially impair the activities, features and / or attributes of a Section 4(f) resource. This means that the value of the Section 4(f) resource, in terms of its prior significance and enjoyment, is substantially reduced or lost as a result of the project.

According to the FAA, a significant impact would occur when the action involves more than a minimal physical use of a Section 4(f) resource or constitutes a "constructive use."

4.3.5.2 USDOT Section 4(f) Impacts

Alternative 1: No Action

The No Action Alternative is not anticipated to result in impacts to USDOT Section 4(f) resources.

Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

Neither Action Alternative would physically impact any Section 4(f) properties within the GSA. As a result, there would be no physical use of a Section 4(f) property. See Section 4.3.12, for additional information on the trails related surface transportation impacts and mitigation. The assessment of potential constructive use impacts focused on changes in noise exposure and concluded that none of the Section 4(f) resources would experience a substantial impairment due to increases in noise from operations or construction. See Section 4.3.10, for additional information on noise impacts. Therefore, the Action Alternatives would not result in significant impacts to Section 4(f) properties.

Mitigation and Minimization Measures

Mitigation

Because there would be no physical or constructive use impacts under any of the alternatives considered, no mitigation would be necessary.

Minimization Measures

No minimization measures have been identified.

4.3.6 Hazardous Materials, Solid Waste, and Pollution Prevention

This section presents the analysis of potential reasonably foreseeable impacts from exposure to hazardous materials, solid waste management and disposal, and applicable pollution prevention measures that could occur due to the Proposed Action and alternatives. Additional information, including information on pollution prevention and recycling, can be found in **Appendix F**.

4.3.6.1 Significant Impact Threshold

The FAA has not established a significance threshold for hazardous materials or solid waste; however, there are several factors to consider during the analysis. If these factors exist, the FAA must evaluate these factors in light of context and intensity to determine if there are significant impacts. Factors that may be relevant include, but are not limited to, situations in which the proposed action or alternative(s) would have the potential to:

- Violate applicable federal, state, tribal, or local laws or regulations regarding hazardous materials and / or solid waste management;
- Involve a contaminated site where impacts cannot be mitigated below significant levels;
- Produce an appreciably different quantity or type of hazardous waste that cannot be disposed of or mitigated adequately;
- Generate an appreciably different quantity or type of solid waste or use a different method of collection or disposal or would exceed local landfill or hazardous waste disposal site capacity; or
- Adversely affect human health and the environment.

4.3.6.2 Hazardous Materials

Alternative 1: No Action

The No Action Alternative is not anticipated to result in new impacts to / from hazardous materials.

Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

The Action Alternatives would utilize construction equipment containing hazardous substances such as oil, fuel, solvents, batteries, or other similar products. All hazardous materials used during construction would be handled, stored, and disposed of in accordance with federal, state, and local requirements.

Eleven documented incidents of hazardous materials contamination are located within the limits of disturbance of one or more elements of the Action Alternatives. The sites are listed in **Table 4-21** and depicted on **Exhibit 4-1.**

TABLE 4-21: DOCUMENTED INCIDENTS OF HAZARDOUS MATERIALS CONTAMINATION WITHIN THE LIMITS OF DISTURBANCE

Map ID	Name	Cleanup Site ID	Address	Site Status	Project that Would Impact the Site:
H-9	Continental Olympic United Fuel Farm	1917	Air Cargo Rd, Seattle, Washington, 98158	Completed under Participation Agreement Conditions	A09: Hardstand (Central)
H-15	Hertz Avis National Fuel Facility QTA	9588	Sea-Tac International Airport	Cleanup Started	L04: Northeast GT Center
H-34	Sea-Tac United Fuel Farm	1918	Sea-Tac International Airport	See H-9	A09: Hardstand (Central)
H-45	Sea-Tac United Tank Removal	7191	2230 S. 161st St, Seattle, Washington, 98158 (Building 161A – TBR)	Cleanup Started	A08: Hardstand (North) S04: Fuel Rack Relocation
H-49	Swissport Fueling	12270	2350 S. 190th St, Seattle, Washington, 98188	Cleanup Started	S01: Fuel Farm Expansion
H-53	United Airlines Sea Tac International Airport	7040	2230 S. 161st St, Seattle, Washington, 98158 (Building 161A – TBR)	Closed under VCP	A08: Hardstand (North) S04: Fuel Rack Relocation
H-60	AFFF Testing and Training Location	N/A	Southern portion of Airfield, between Runway 34L and Runway 34C	N/A	S02: Primary ARFF
H-63	Aircraft Engine Fire / AFFF Release	N/A	Central Airfield on Taxiway B	N/A	A04: Taxiway B 500-foot Separation
H-67	ARFF Station AFFF Storage and Testing / Training	N/A	ARFF Station	N/A	T01: North Gates
H-72	AFFF Accidental Release	N/A	Airport Fuel Farm	N/A	S01: Fuel Farm Expansion
H-73	AFFF Storage for Fuel Farm	N/A	Airport Fuel Farm	N/A	S01: Fuel Farm Expansion

Source: Washington Department of Ecology, *What's In My Neighborhood Tool*, accessed February 2023. (https://apps.ecology.wa.gov/neighborhood/). WSDE data was supplemented with current, Port of Seattle data where applicable.

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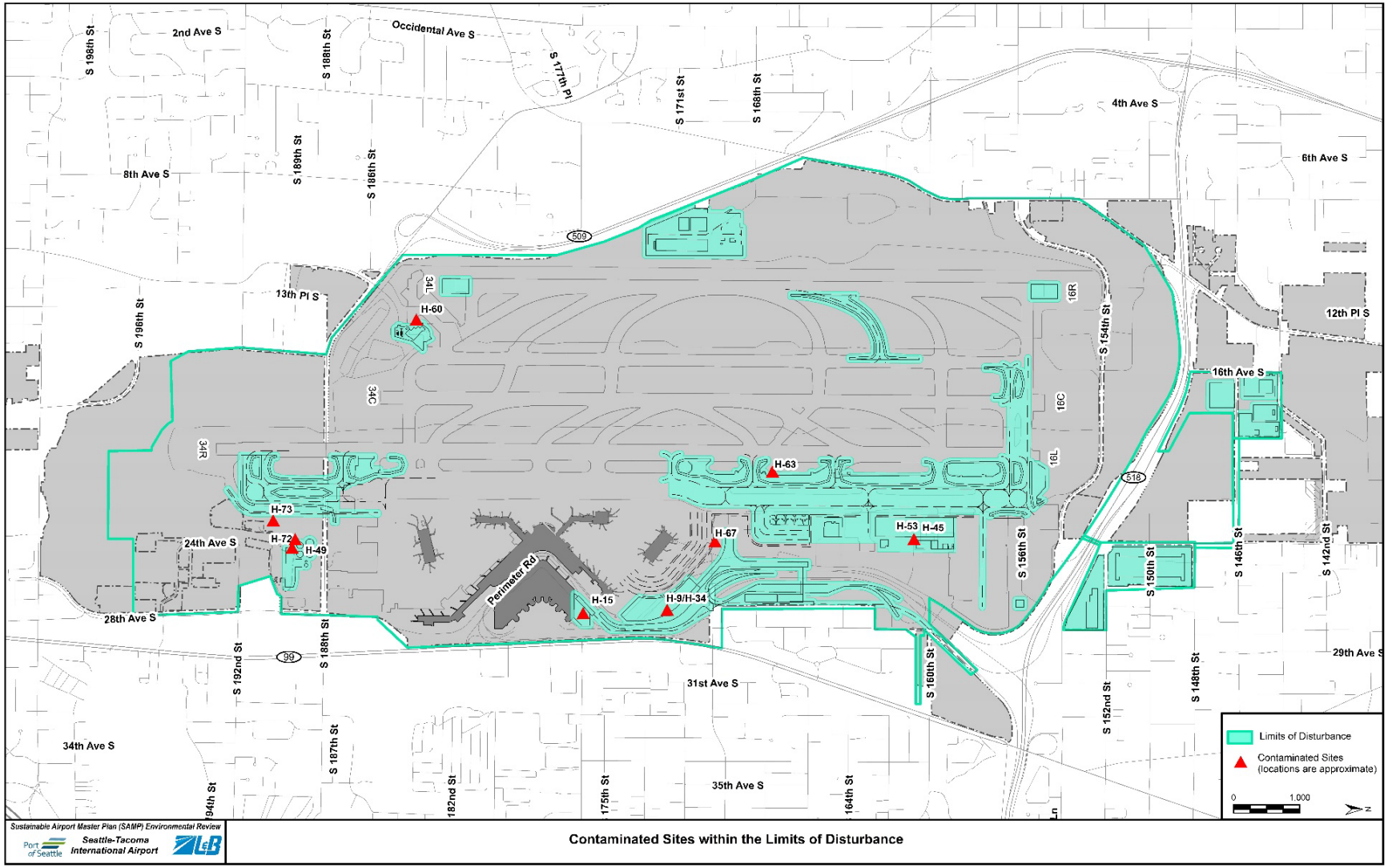
EXHIBIT 4-1: CONTAMINATED SITES WITHIN THE LIMITS OF DISTURBANCE



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All work within an area of contamination would be conducted in accordance with the Port's Construction General Requirements for handling contaminated soil.[51] These general requirements include utilizing an approved Contaminated Soils Management Plan identifying disposal facilities and BMPs such as: soil and construction stockpile controls (such as covering and maintaining stockpiles to prevent erosion), construction site controls (such as sweeping and cleaning pavements outside the work area to remove debris), and personal protective equipment requirements for worker safety and protection.

All material excavated from within the project area would be tested prior to disposal. Any material found to be contaminated would either be removed and disposed of in accordance with federal, state, and local requirements, encapsulated on-site to minimize any human health or environmental exposure risk, or remediated below established cleanup levels. As is standard for Port construction projects,[52] all excavations would be monitored by a trained environmental professional for evidence of unanticipated contaminated soils under SEA's Environmental Agent Work Plan. None of the hazardous materials known to potentially be encountered are uncommon and the Port would comply with applicable rules and regulations to handle and dispose of the materials safely.

If any unanticipated hazardous materials, waste, or contaminated soils are encountered during construction the discovery would immediately be brought to the attention of the Port's Project Manager for determination of appropriate action. The contractor would be prohibited from disturbing such hazardous materials or contaminated soils until directed by the Project Manager. Soils determined to be contaminated and requiring removal would be hauled and disposed of as contaminated materials, in accordance with federal, state, and local requirements, including, but not limited to:

- Management of Hazardous Waste (49 U.S.C. § 260-280)
- Transportation of Hazardous Waste (49 U.S.C. § 171-199)
- The Model Toxics Control Act (Revised Code of Washington [RCW] 70.105D.010)
- Dangerous Waste Regulations (Washington Administrative Code [WAC] 173-303)

Given that the Port would construct and operate the new facilities in accordance with these and other requirements, no significant impacts to, or from, hazardous materials are anticipated as a result of the Action Alternatives.

Buildings to be Demolished

The Action Alternatives include the demolition of 12 existing buildings: Building 160D, Gourmet Flight Kitchen; Building 161A, United Airlines Maintenance; Building 161E Cargo 4E; Building 161G, Port Maintenance Building; Building 166B United Airlines Maintenance / Cargo 4S; Building 167A / 167B, Cargo 6 Swissport; Building 170A, ARFF; Building 170B Doug Fox Payment Building; Building 170C Doug Fox Office; Building 170 D Guard Shack, Building 170W, Port Westside Field Offices, and Building 188WB, PACCAR Building. Given the age of these structures (except for Buildings 170B and 170C which were built in 2014 and Building 170D which was built in 2006), each has the potential to contain regulated building materials including, but not limited to, asbestos-containing materials (commonly found in floor and ceiling tiles and insulation), lead paint, and mercury (commonly found in fluorescent light tubes and thermostats). Previous surveys of four of the buildings confirmed varying amounts of regulated building materials in three out of the four buildings (167A, 170A, and 170W). No regulated building materials were found in Building 161A. In addition, because most of these structures have been used for maintenance or storage of equipment, each has the potential for underground fuel lines, utility lines, or areas of subsurface contamination.

[51] Port of Seattle Master Specification Section 02 61 13 – Handling Contaminated Soils.
[52] Port of Seattle Master Specification Section 02 61 13 – Handling Contaminated Soils.

Port construction requirements require development of a pollution prevention plan that includes an inventory / inspection of known hazardous materials in the buildings and on the site, a hazardous material cleanup and disposal plan, and a site-specific plan outlining administrative, operational, and structural BMPs that would be implemented to minimize risks and respond to any incidents should they occur.[53] A Contractor's Safety Plan is also required by the Port to document site-specific emergency procedures, and may include respiratory protection requirements, personal protective equipment requirements, and other safety requirements.[54] These requirements would avoid or minimize risks of exposure or offsite pollutant transport. Given this framework, no significant impacts related to building demolition are anticipated as part of the Action Alternatives.

Per- and Polyfluoroalkyl Substances (PFAS)

Five sites where PFAS is either stored or has been deployed for an incident would be impacted by the Action Alternatives. These include H-60 (testing / training location), H-63 (engine fire on Taxiway B), H-67 (ARFF Station), H-72 (Fuel Farm release), and H-73 (Fuel Farm storage). Construction occurring on or near these sites would follow Port specifications for handling contaminated soil noted above. As regulations for PFAS are in development at the state and federal level, the Port would ensure work is conducted in accordance with all applicable PFAS regulations in place at the time of construction.

Mitigation and Minimization Measures

Mitigation

Established regulations and construction protocols would mitigate risks, exposure, or pollutant transport should unknown areas of contamination be encountered during construction. These include, but are not limited to:

- WSDE's MTCA cleanup levels listed in the MTCA Method A Tables 720-1, Table 740-1, and Table 745-1 (Washington Administrative Code [WAC] 173-340-900)
- The Port's Environmental Agent Work Plan
- Sea-Tac Airport Construction Safety Manual
- Sea-Tac Airport Construction General Requirements

To document that construction actions have not impacted groundwater quality within or downgradient of the work area, the Port will monitor contaminant levels in groundwater during and following completion of construction. Given these construction protocols and BMPs, no significant impacts to / from hazardous materials would occur as a result of implementing the Action Alternatives.

Minimization Measures

No minimization measures or additional BMPs beyond those already included above are anticipated to be implemented.

4.3.6.3 Solid Waste and Recycling

Alternative 1: No Action

Because the number of passengers would increase under the No Action Alternative, waste generation would also increase. Despite the increase in solid waste and recycling materials, the quantity and type of waste would not be appreciably different, and it would not exceed local landfill capacity. King

[53] Sea-Tac Airport Construction General Requirements, Section 01 57 23 – Pollution Prevention Planning and Execution.
[54] Sea-Tac Airport Construction General Requirements, Section 01 35 29T – Tenant Safety Management, Appendix A.

County's Solid Waste Division has identified that there is adequate capacity in the Cedar Hills Regional Landfill to continue accepting waste beyond 2028. In November 2022 the County identified a preferred alternative for landfill development. This development is estimated to increase Cedar Hills Regional Landfill life until early 2038.[55]

Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

Construction activities associated with the Action Alternatives would generate additional solid waste, such as construction debris (e.g. asphalt, concrete, and wood), building materials (e.g. steel, wood, glass, and plastic products), and other materials commonly associated with facility construction. The selected contractor would be responsible for managing and disposing of construction generated waste in accordance with a Waste Management Plan and Waste Management Final Report. The Port's existing Waste Diversion and Recycling Program would also continue, and the selected contractor would be expected to meet the goal of diverting at least 90 percent of construction debris from the landfill.

Once the proposed improvements have been completed, the additional terminal, gates, and passengers utilizing these facilities would result in an increase of solid waste being generated at the Airport. Waste generation forecasts, presented in **Table 4-22**, for the Action Alternatives were based on passenger projections, historic data on waste generated per passenger, past analysis of modeling related to increases in square footage of food service concessionaires, and modeling related to increases in square footage of remote facilities. Given the Port's continued recycling programs, the needs for additional waste disposal are considered conservative.

TABLE 4-22: SOLID WASTE PROJECTIONS (IN TONS) FOR THE ACTION ALTERNATIVES IN 2032 AND 2037

Facility	No Action	Action Alternatives	Difference
2032 Terminal	10,067	12,807	2,740
2032 Airfield	3,018	3,335	317
2037 Terminal	10,519	14,091	3,572
2037 Airfield	3,140	3,667	527

Source: Data provided by Port, 2023. Based on Seattle-Tacoma International Airport Solid Waste Growth Forecast and Capacity Analysis 2020–2034, 2020.

The additional waste would not be significantly more than the No Action. As discussed under No Action, there is sufficient landfill capacity to accommodate the additional solid waste. Because neither alternative would result in appreciably different quantity of waste; different method of collection or disposal; exceedance of disposal capacity; or changes in waste diversion and recycling, no significant impacts related to solid waste would be expected.

Mitigation and Minimization Measures

Mitigation

Because no significant impacts to solid waste were identified, no mitigation is necessary.

Minimization Measures

No minimization measures beyond those already included above have been identified.

[55] https://kingcounty.gov/en/dept/dnrp/waste-services/garbage-recycling-compost/solid-waste-facilities/cedar-hills-development, accessed May 2024.

4.3.7 Historical, Architectural, Archaeological, and Cultural Resources

This section presents the results of the NHPA Section 106 process, which assesses the effects an "undertaking" would have on historical, architectural, archaeological, and cultural resources. The FAA conducted the required consultation with the Washington SHPO through the Washington State DAHP and federally-recognized Native American Tribes under the NHPA. More information on the consultation and the analysis can be found in **Appendix G**.

4.3.7.1 Significant Impact Threshold

In making a Section 106 effect determination and analyzing for reasonably foreseeable impacts under NEPA, the FAA considers several different types of impacts to historic properties, including direct and indirect effects from both construction and operation activities.

The FAA has not established a significance threshold for historical, architectural, archaeological, and cultural resources. However, the FAA does consider the context and intensity of adverse effects. NHPA regulations state that an adverse effect finding is not necessarily significant under NEPA. Resolution of adverse effects may be sufficient to avoid a significant impact.

4.3.7.2 Historical, Architectural, Archaeological, and Cultural Resources Impacts

Alternative 1: No Action

The No Action Alternative is not anticipated to result in impacts to any properties that are listed on or eligible for the NRHP.

Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

There are no NRHP-eligible properties located within the APE. Therefore, the FAA determined that a finding of No Adverse Effect was appropriate. The FAA and the Port agreed to include an Inadvertent Discoveries Plan, which would be prepared for all projects, and to have an archaeological monitor on-site during ground disturbing activities for projects C03, S10, T02, L03, L05, L07, and the southern half of C02 as part of the No Adverse Effect finding given the potential to locate resources in these areas. FAA submitted a finding of No Adverse Effect to DAHP on August 3, 2021. DAHP concurred with the finding of No Adverse Effect on August 30, 2021. The FAA also initiated government-to-government consultation with Native American Tribes on July 28, 2021. The FAA updated the APE to include potential visual impacts for the proposed cargo facilities (C02 and C03) and DAHP concurred with the updated APE on November 16, 2023. FAA submitted an updated finding of No Adverse Effect to DAHP on July 11, 2024 and DAHP concurred with the updated finding on July 12, 2024. The FAA submitted an updated finding of No Adverse Effect to DAHP on July 16, 2025, and DAHP concurred with the updated finding on July 21, 2025.

Mitigation and Minimization Measures

Mitigation

A Monitoring and Inadvertent Discovery Plan will be prepared to identify the steps that would be taken if archaeological materials are inadvertently encountered during construction. An archaeological monitor will be on-site as explained above.

Minimization Measures

No minimization measures have been identified.

4.3.8 Land Use

This section describes the analysis of potential reasonably foreseeable land use impacts associated with the Proposed Action and alternatives. Additional information related to local land use plans and the analysis of those plans can be found in **Appendix H**.

4.3.8.1 Significant Impact Threshold

The FAA has not established a significance threshold for land use. The determination that significant impacts exist in the Land Use impact category is normally dependent on the significance of other impacts. FAA Order 1050.1F states “the compatibility of land uses in the vicinity of an airport may also need to be assessed to ensure those uses do not adversely affect safe aircraft operations.”

4.3.8.2 Land Use Impacts

Alternative 1: No Action Alternative

The No Action Alternative is not anticipated to result in impacts to existing and future planned land uses and would be consistent with local land use plans.

Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

The Action Alternatives would occur entirely on Port-owned property and would be consistent with the conditionally approved ALP. Each of the local land use plans for jurisdictions adjacent to or in the vicinity of SEA have recognized the Airport operations, including in some cases specifically addressing the potential for additional development of Airport property or property in the vicinity of SEA for Airport related operations. The State Growth Management Act, RCW 36.70.547, further protects airport development and operations from inconsistent or incompatible land uses being developed adjacent to the airport. **Table 4-23** presents the local plans and how the Action Alternatives are consistent with each plan.

TABLE 4-23: CONSISTENCY WITH LOCAL PLANS

Plan	Consistency with Plan
Port and City of SeaTac ILA (2018)	All elements would be considered allowable land uses per the ILA and are therefore consistent with this agreement.
City of SeaTac Comprehensive Plan (updated in 2021)	All project elements would occur in the City of SeaTac, within the areas governed by this plan. All project elements would be consistent with this plan, as the City's zoning code mirrors the ILA allowable land uses within the Airport areas.
Des Moines Comprehensive Plan (2015, amended in 2020)	None of the project elements, nor significant direct or indirect impacts of the Action Alternatives, would occur within the City of Des Moines. Therefore, the Action Alternatives would be consistent with the Des Moines Comprehensive Plan.
The Burien Plan (updated in 2022)	None of the project elements, nor significant direct or indirect impacts of the Action Alternatives, would occur within the City of Burien. Therefore, the Action Alternatives would be consistent with the Burien Plan.
Tukwila Comprehensive Plan (2015)	None of the project elements, nor significant direct or indirect impacts of the Action Alternatives would occur within the City of Tukwila. Therefore, the Action Alternatives would be consistent with the Tukwila Comprehensive Plan.
Puget Sound Regional Council - Vision 2050 (adopted in 2020)	The VISION 2050 calls for cities and counties to continue preserving industrial lands and limit the encroachment of incompatible land uses around airports, particularly in the critical approach and departure paths. Because the Action Alternatives would be compatible with Airport operations and would not encroach upon the critical approach and departure paths, they would be considered compatible with this goal. The Action Alternatives would also support growth at SEA, and therefore be consistent with the PSRC's goals to leverage the region's position as an international gateway and optimize commercial aviation activities.

Mitigation and Minimization Measures

Mitigation

Because no inconsistencies with local plans were identified, no mitigation would be necessary.

Minimization Measures

No minimization measures have been identified.

4.3.9 Natural Resources and Energy Supply

This section describes the analysis of potential reasonably foreseeable impacts to natural resources and energy supply associated with the Proposed Action and alternatives.

4.3.9.1 Significant Impact Threshold

The FAA has not established a significance threshold for natural resources and energy supply. However, the FAA considers the potential of the project to cause demand that exceeds available or future supplies of natural resources or energy supply when evaluating the context and intensity of potential impacts. For most actions, changes in energy demands or other natural resource consumption will not result in significant impacts. If an EA identifies problems such as demand exceeding supply, additional analysis may be required. Otherwise, impacts are not considered significant.

4.3.9.2 Energy Supply

Alternative 1: No Action

Electricity and Natural Gas

Demand for electricity and natural gas at SEA would continue to increase under the No Action due to the increase in total number of passengers utilizing SEA. **Table 4-24** provides the anticipated electricity demand and **Table 4-25** provides the anticipated natural gas demand under the No Action.

TABLE 4-24: PROJECTED ANNUAL ELECTRICAL DEMAND FROM THE NO ACTION ALTERNATIVE (2032 AND 2037)

Alternative	Additional Annual Electrical Use (MWH)
No Action (2032 and 2037)	152,804

Notes: Estimates are based on the additional square footages of the projects included in the No Action Alternative.
MWH = megawatt-hours

TABLE 4-25: PROJECTED ANNUAL NATURAL GAS DEMAND FROM THE NO ACTION ALTERNATIVE (2032 AND 2037)

Alternative	Additional Annual Natural Gas Use (therms)
No Action (2032 and 2037)	3,769,066

Notes: Estimates are based on the additional square footages of the projects included in the No Action Alternative.
1 therm = a unit of heat equivalent to 100,000 British Thermal Units

Fuel Consumption

Fuel demand is expected to increase under the No Action due to the projected increase in aircraft operations. The anticipated fuel demand is provided in **Table 4-26**. Because the No Action does not include any new fuel storage capacity, the increase in demand would require SEA to evaluate options to meet future minimum fuel storage requirements. Although Jet A fuel is not in short supply, the BP Olympic Pipeline is near capacity, and during summer peak operations at SEA there are often challenges having enough jet fuel in storage tanks to meet desired storage levels. This could become even more critical if a disruption in the BP Olympic Pipeline serving SEA occurred.

TABLE 4-26: PROJECTED ANNUAL FUEL DEMAND FROM THE NO ACTION ALTERNATIVE (2032 AND 2037) IN GALLONS

Fuel Type	2032 No Action	2037 No Action
Jet A	692,985,758	704,820,987
Diesel	560,280	569,849
Gasoline	609,743	620,157

Notes: Projections are based on the ratio of usage per operation, based on 2022 actual data.
Sources: Port of Seattle data; Landrum & Brown analysis 2023.

Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

The new facilities proposed as part of the Action Alternatives would result in an increase in demand for energy, but that increase can be met by available supply. The following summarizes the findings for each energy source.

Electricity and Natural Gas

While implementing the Action Alternatives would increase the demand for electricity (**Table 4-27**), the additional energy demand would not exceed the available energy supplies in the Seattle-Tacoma area. During the development of the NTPs, the Port would utilize the Sustainable Evaluation Framework, which identifies opportunities to reduce energy and waste for each project.

BPA provides 90 percent of the electric power using PSE transmission infrastructure within the Airport fence line. BPA has more than 15,000 circuit miles of transmission lines, 260 substations and an extensive network of related transmission facilities, telecommunications, and IT infrastructure across six states, which allows for the sale of surplus power across the West.[56]

TABLE 4-27: COMPARISON OF PROJECTED ANNUAL ELECTRICAL DEMAND FROM THE ACTION ALTERNATIVES (2032 AND 2037)

Alternative	Additional Annual Electrical Use (MWH)
No Action (2032 and 2037)	152,804
Action Alternatives (2032 and 2037)	209,223
Increase	56,419

MWH = megawatt-hours
Sources: SAMP Technical Memo No. 9, Table 4-3; Landrum & Brown analysis, 2023.

While implementing the Action Alternatives would increase the demand for natural gas (**Table 4-28**), the additional demand would not exceed the available energy supplies, which are not in short supply in the Seattle-Tacoma area. As of 2022, Canada, where SEA natural gas typically comes from, is estimated to have 1,368 trillion cubic feet of natural gas resources, an amount equal to over 200 years of current annual demand.[57] RNG is used (planned to continue into the future until at least 2030) for approximately 60 percent usage of natural gas in the boilers and all the natural gas supply at the CNG fueling station.[58]

[56] Bonneville Power Administration 2018–2023 Strategic Plan.
[57] Natural Gas Facts, Canadian Gas Association, https://www.cga.ca/natural-gas-statistics/natural-gas-facts/, accessed January 15, 2024.
[58] This Port of Seattle contract commenced in October of 2020 and is for a term of 10 years.

TABLE 4-28: COMPARISON OF PROJECTED ANNUAL NATURAL GAS DEMAND FROM THE ACTION ALTERNATIVES (2032 AND 2037)

Alternative	Additional Natural Gas Use (therms)
No Action (2032 and 2037)	3,769,066
Action Alternatives (2032 and 2037)	5,133,321
Increase	1,364,255

1 therm = a unit of heat equivalent to 100,000 British Thermal Units
Sources: SAMP Technical Memo No. 9, Table 4-4; Landrum & Brown analysis, 2023.

Fuel Consumption - Jet A / Diesel / Gas

Table 4-29 shows the projected Jet A, diesel, and gasoline fuel consumption for the Action Alternatives in 2032 and 2037. Action Alternatives would address the storage concerns described above and improve resiliency for emergencies as well as day-to-day operations by increasing the storage capacity of SEA's fuel farm. The proposed Fuel Farm Expansion (Project S01) would also provide storage and blending infrastructure to support the Port's SAF goal to power every flight fueled at SEA with at least a ten percent blend of SAF. The increased use of SAF would reduce the demand for Jet A fuel. Anticipated increases in diesel and gasoline usage because of construction and operation of the Action Alternatives would not result in a significant impact because diesel and gasoline are not in short supply in the region.

TABLE 4-29: PROJECTED FUEL CONSUMPTION FROM THE ACTION ALTERNATIVES (2032 AND 2037) IN GALLONS

Fuel Type	No Action	Action Alternatives	Increase
2032 Jet A	692,985,758	705,980,168	12,994,410
2032 Diesel	560,280	570,786	10,506
2032 Gasoline	609,743	621,177	11,434
2037 Jet A	704,820,987	756,795,661	51,974,674
2037 Diesel	569,849	611,870	42,022
2037 Gasoline	620,157	665,888	45,731

Notes: Projections are based on the ratio of usage per operation, based on 2022 actual data.
Sources: Port of Seattle data; Landrum & Brown analysis 2023.

Mitigation and Minimization Measures

Mitigation

Because no significant impacts related to energy supply were identified, no mitigation is necessary.

Minimization Measures

Minimization measures (efficiencies or upgrades in mechanical systems, upgrades in lighting, and alternative fuel sources) and BMPs would be used to minimize energy use during and after construction of the Proposed Action or the Hybrid Terminal Option.

4.3.9.3 Natural Resources

Alternative 1: No Action

Water

Because the total number of passengers utilizing SEA is expected to continue to increase even under the No Action scenario, there would be additional demand on water supply associated with this alternative (see **Table 4-30**). There is ample supply of water to handle this increase in demand.

Other Natural Resources

The No Action Alternative is not anticipated to result in impacts to other natural resources.

Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

Water

The Action Alternatives would result in an increase in demand for water. **Table 4-30** shows estimated future water usage based on the projected number of future passengers, and the average gallons used per passenger.

TABLE 4-30: PROJECTED WATER USAGE IN GALLONS (2032 AND 2037)

Alternative	Water Consumption (gallons)
2032 No Action	307,011,771
2032 Action Alternatives	313,040,864
2037 No Action	319,428,097
2037 Action Alternatives	344,181,622

Sources: Port of Seattle data; Landrum & Brown analysis 2023.

Because there is ample supply of water to handle this increase in demand, no significant impact related to water usage would occur.

Other Natural Resources

The construction of the Action Alternatives would require the use of other natural resources such as sand, gravel, concrete, asphalt, and water, in addition to construction materials such as steel, wood, and glass. Metal wiring and plastic insulation would be used for new lighting. These construction materials are not in short supply in the Seattle-Tacoma area and construction of the Action Alternatives is unlikely to exceed the available supply of these materials. Therefore, no significant impact related to other natural resource usage would occur.

Mitigation and Minimization Measures

Mitigation

Because no significant impacts related to natural resources were identified, no mitigation is necessary.

Minimization Measures

Minimization measures (use of recyclable materials, minimize and recycle construction waste) and BMPs related to water usage and use of other natural resources would be used to minimize impacts during construction.

4.3.10 Noise and Noise-Compatible Land Use

This section presents the results of analysis of reasonably foreseeable impacts from aircraft and construction noise from the Proposed Action and alternatives. The impact of aircraft-related noise levels upon the surrounding area is presented as the number and type of noise sensitive land uses located within the noise contours for each alternative for both 2032 and 2037 conditions. Noise contours for the levels of DNL 65, 70, and 75 dB were calculated and represent average-annual day conditions. Construction noise considers the distance of any noise sensitive land uses from construction sites.

There are minor differences in the taxiway layout and location of where aircraft would park for passenger loading / unloading among the different alternatives. However, the primary factor that resulted in changes in noise exposure was the number of aircraft operations, the fleet mix, and the day-night split assumed for the average-annual day in each alternative condition. **Table 4-31** presents the average-annual day operations for each of the alternatives assessed in this section. **Appendix J** contains the protocol for the noise analysis and detailed information about the noise analysis including modeling inputs. **Appendix A** contains additional information on the forecast and operational assumptions.

TABLE 4-31: ANNUAL-AVERAGE DAY OPERATIONS

Alternative	Arrivals Day	Arrivals Night	Departures Day	Departures Night	Total Operations
2032 No Action	531.98	108.88	542.11	96.21	1,279.18
2032 Action Alternatives	544.56	108.31	550.04	100.25	1,303.16
2037 No Action	552.22	99.62	548.85	100.34	1,300.96
2037 Action Alternatives	587.38	112.49	588.93	108.16	1,396.96

Notes: Totals may not sum due to rounding.
Daytime = 7:00am – 9:59pm, Nighttime = 10:00pm – 6:59am.
Source: Aviation Forecast Update, prepared by Port of Seattle / Leigh-Fisher, 2023, Sustainable Airport Master Plan – Near-Term Projects, Constrained Operating Growth Scenarios, Seattle-Tacoma International Airport, Landrum & Brown, July 2023.

4.3.10.1 Significant Impact Threshold

According to FAA Order 1050.1F, a noise impact is significant if the alternative would increase noise by DNL 1.5 dB or more for a noise sensitive area that is exposed to noise at or above the DNL 65 dB level, or that will be exposed at or above the DNL 65 dB level due to a DNL 1.5 dB or greater increase, when compared to the No Action for the same timeframe.

4.3.10.2 Aircraft Noise Modeling Results – 2032 Conditions

Alternative 1: No Action

The 65+ DNL of the Future (2032) No Action noise exposure contour encompasses approximately 10.10 square miles within the cities of Burien, Des Moines, and SeaTac, and unincorporated King County. The 65+ DNL contour extends approximately 3.7 miles to the north and 3.3 miles south of SEA. The area within the contour to the north and south is made up of a mix of residential, commercial, and industrial land uses. There would be a total of 9,518 housing units, of which 4,534 are sound insulated, with an estimated population of 21,975 people within the 65+DNL. There would be 12 schools (five have been sound insulated and one additional school is in the process of being sound insulated), 22 places of worship, five nursing homes, and two libraries within the 65+ DNL noise contour.

Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

The 65+ DNL of the Future (2032) Action Alternatives noise exposure contour encompasses approximately 10.25 square miles, which is 0.15 square miles larger than the Future (2032) No Action noise exposure contour. The 65+ DNL contour extends approximately 3.7 miles to the north and 3.3 miles south of SEA. The area within the contour to the north and south is made up of a mix of residential, commercial, and industrial land uses. There would be a total of 9,855 housing units, of which 4,694 are sound insulated, with an estimated population of 22,799 people within the 65+DNL. There would be 12 public schools (five have been sound insulated and one additional school is in the process of being sound insulated), 22 places of worship, five nursing homes, and two libraries within the 65+ DNL noise contour, which is the same as the Future (2032) No Action Alternative.

Exhibit 4-2 shows the comparison of the Future (2032) No Action noise exposure contours and the Future (2032) Action Alternatives noise exposure contours. The comparison shows the small increase in the contour to the north and the south compared to the Future (2032) No Action. This directly corresponds to the predicted increase in operations between the two alternatives. The Future (2032) Action Alternatives would not increase noise by 1.5 DNL or more for a noise sensitive area at or above the 65 DNL (the range of increase was between 0.0 DNL and 0.6 DNL) or that would be exposed at or above the 65 DNL level due to a 1.5 dB or greater increase, (range of increase was between 0.03 – 0.16 DNL within the 63.5 – 65 DNL) when compared to the Future (2032) No Action. Therefore, no significant noise impact would occur as a result of implementing the Future (2032) Action Alternatives.

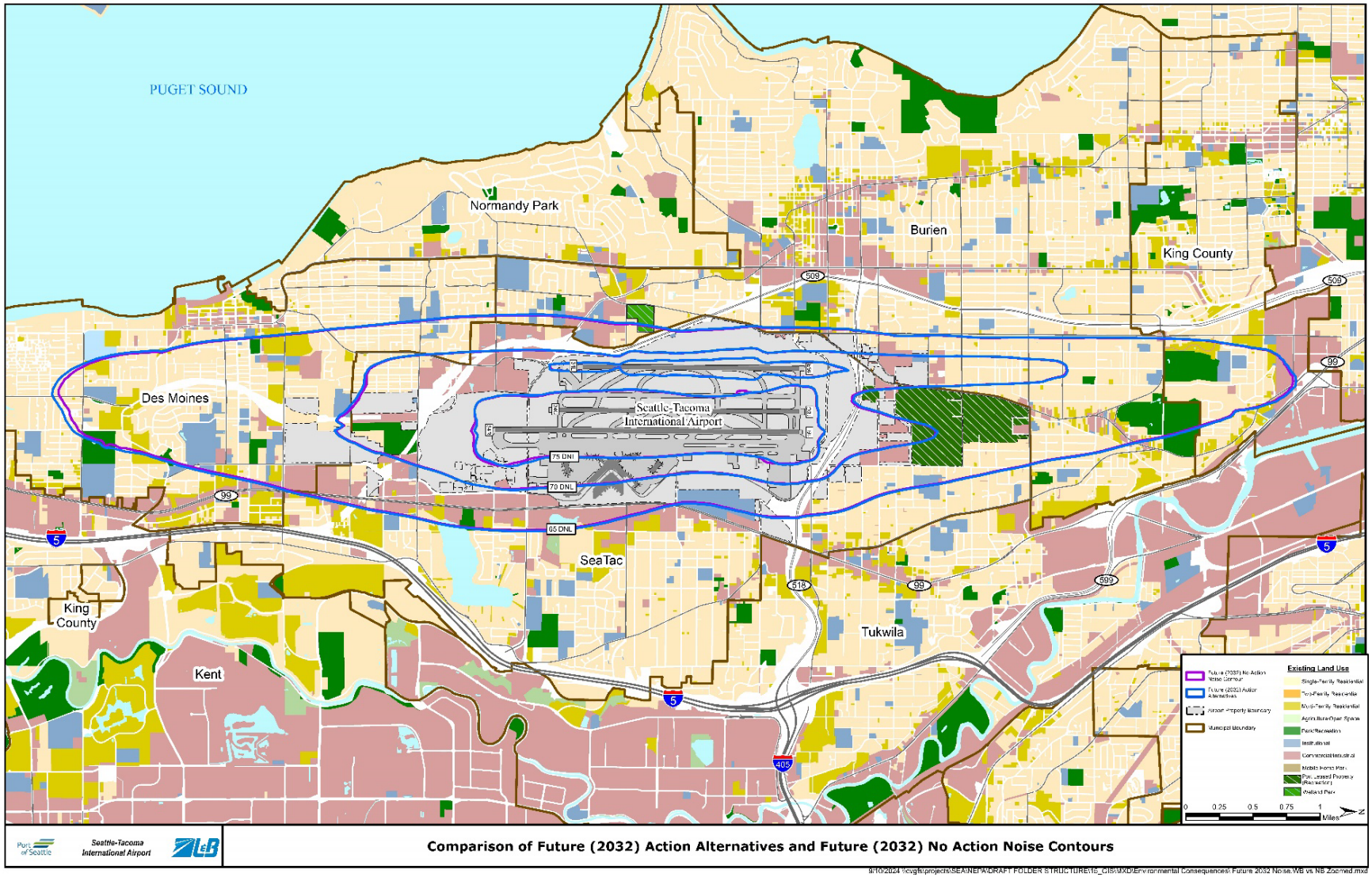
Table 4-32 summarizes the comparison of housing units and estimated population for 2032 in the alternatives. The Future (2032) Action Alternatives would increase the total number of housing units by 337 and population by 824 within the 65+ DNL as compared to the Future (2032) No Action. The increase in residences and population is attributed to the predicted increase in the size of the Future (2032) Action Alternatives noise exposure contour as compared to the Future (2032) No Action noise exposure contour.

TABLE 4-32: NOISE SENSITIVE FACILITIES COMPARISON (2032)

Mitigation Status / Land Use	No Action DNL 65+ dB	Action Alternatives DNL 65+ dB	Difference
Sound Insulation Completed			
Single-Family	4,146	4,258	+112
Multi-Family	388	436	+48
Mobile Home	0	0	0
Subtotal	*4,534*	*4,694*	*+160*
Not Sound Insulated			
Single-Family	1,046	1,089	+43
Multi-Family	3,782	3,895	+113
Mobile Home	156	177	+21
Subtotal	*4,984*	*5,161*	*+177*
Total Housing Units	**9,518**	**9,855**	**+337**
Total Estimated Population	**21,975**	**22,799**	**+824**

Source: Landrum & Brown analysis, 2024. See also Appendix J.

EXHIBIT 4-2: COMPARISON OF FUTURE (2032) ACTION ALTERNATIVES AND FUTURE (2032) NO ACTION NOISE CONTOURS



Sources: AEDT Version 3f; Landrum & Brown analysis, 2024

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4.3.10.3 Aircraft Noise Modeling Results – 2037 Conditions

Alternative 1: No Action

The 65+ DNL of the Future (2037) No Action noise exposure contour encompasses 9.16 square miles within the cities of Burien, Des Moines, and SeaTac, and unincorporated King County. This area is smaller than the 65+ DNL of the Future (2032) No Action due to the increase in the number of Boeing 737-7/8/9 MAX aircraft forecasted to be operating in the fleet. The MAX aircraft have a substantially smaller noise footprint than the aircraft they are replacing (Boeing 737-700/800/900 aircraft).

The 65+ DNL contour extends approximately 3.6 miles to the north and 3.0 miles south of SEA. The area within the contour to the north and south is made up of a mix of residential, commercial, and industrial land uses. There would be a total of 7,166 housing units, of which 3,871 are sound insulated, with an estimated population of 16,297 people within the 65+DNL. There would be 10 schools (five have been sound insulated and one additional school is in the process of being sound insulated), 21 places of worship, four nursing homes, and two libraries within the 65+ DNL noise contour.

Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

The 65+ DNL of the Future (2037) Action Alternatives noise exposure contour encompasses 9.82 square miles, which is 0.66 square miles larger than the Future (2037) No Action noise exposure contour. This area is smaller than the 65+ DNL of the Future (2032) Action Alternatives due to the increase in the number of Boeing 737-7/8/9 MAX aircraft forecasted to be operating in the fleet. The 65+ DNL contour extends approximately 3.7 miles to the north and 3.2 miles south of SEA. The area within the contour to the north and south is made up of a mix of residential, commercial, and industrial land uses. There would be a total of 9,017 housing units, of which 4,325 are sound insulated, with an estimated population of 20,736 people within the 65+DNL. There would be 11 public schools (five have been sound insulated and one additional school is in the process of being sound insulated), 21 places of worship, four nursing homes, and two libraries within the 65+ DNL noise contour, which is one more school than the Future (2037) No Action, the Community Chapel Christian School.

Exhibit 4-3 shows the comparison of the Future (2037) No Action Alternative noise exposure contours and the Future (2037) Action Alternatives noise exposure contours. The comparison shows the increase in the contour to the north and the south compared to the Future (2037) No Action. This primarily corresponds to the increase in operations.

The Future (2037) Action Alternatives would not increase noise by 1.5 DNL or more for a noise sensitive area at or above the 65 DNL (the range of increase was between 0.0 DNL and 0.6 DNL) or that would be exposed at or above the 65 DNL level due to a 1.5 dB or greater increase (range of increase was between 0.26 – 0.46 DNL within the 63.5 – 65 DNL), when compared to the Future (2037) No Action. Therefore, no significant noise impact would occur as a result of implementing the Future (2037) Action Alternatives.

Table 4-33 summarizes the comparison of housing units and estimated population for 2037. The Future (2037) Action Alternatives would increase the total number of housing units by 1,851 and population by 4,439 within the 65+ DNL as compared to the Future (2037) No Action. The increase in residences and population is attributed to the increase in the size of the Future (2037) Action Alternatives noise exposure contour as compared to the Future (2037) No Action noise exposure contour.

TABLE 4-33: NOISE SENSITIVE FACILITIES COMPARISON (2032 AND 2037)

Mitigation Status / Land Use	2032 No Action DNL 65+ dB	2032 Action Alternatives DNL 65+ dB	Difference	2037 No Action DNL 65+ dB	2037 Action Alternatives DNL 65+ dB	Difference
Sound Insulation Completed						
Single-Family	4,146	4,258	+112	3,546	3,959	+413
Multi-Family	388	436	+48	325	366	+41
Mobile Home	0	0	0	0	0	0
Subtotal	*4,534*	*4,694*	*+160*	3,871	4,325	*+454*
Not Sound Insulated						
Single-Family	1,046	1,089	+43	837	989	+152
Multi-Family	3,782	3,895	+113	2,356	3,572	+1,216
Mobile Home	156	177	+21	102	131	+29
Subtotal	*4,984*	*5,161*	*+177*	3,295	4,692	*+1,397*
Total Housing Units	**9,518**	**9,855**	**+337**	**7,166**	**9,017**	**+1,851**
Total Estimated Population	**21,975**	**22,799**	**+824**	**16,297**	**20,736**	**+4,439**

Source: Landrum & Brown analysis, 2024. See also Appendix J.

Mitigation and Minimization Measures

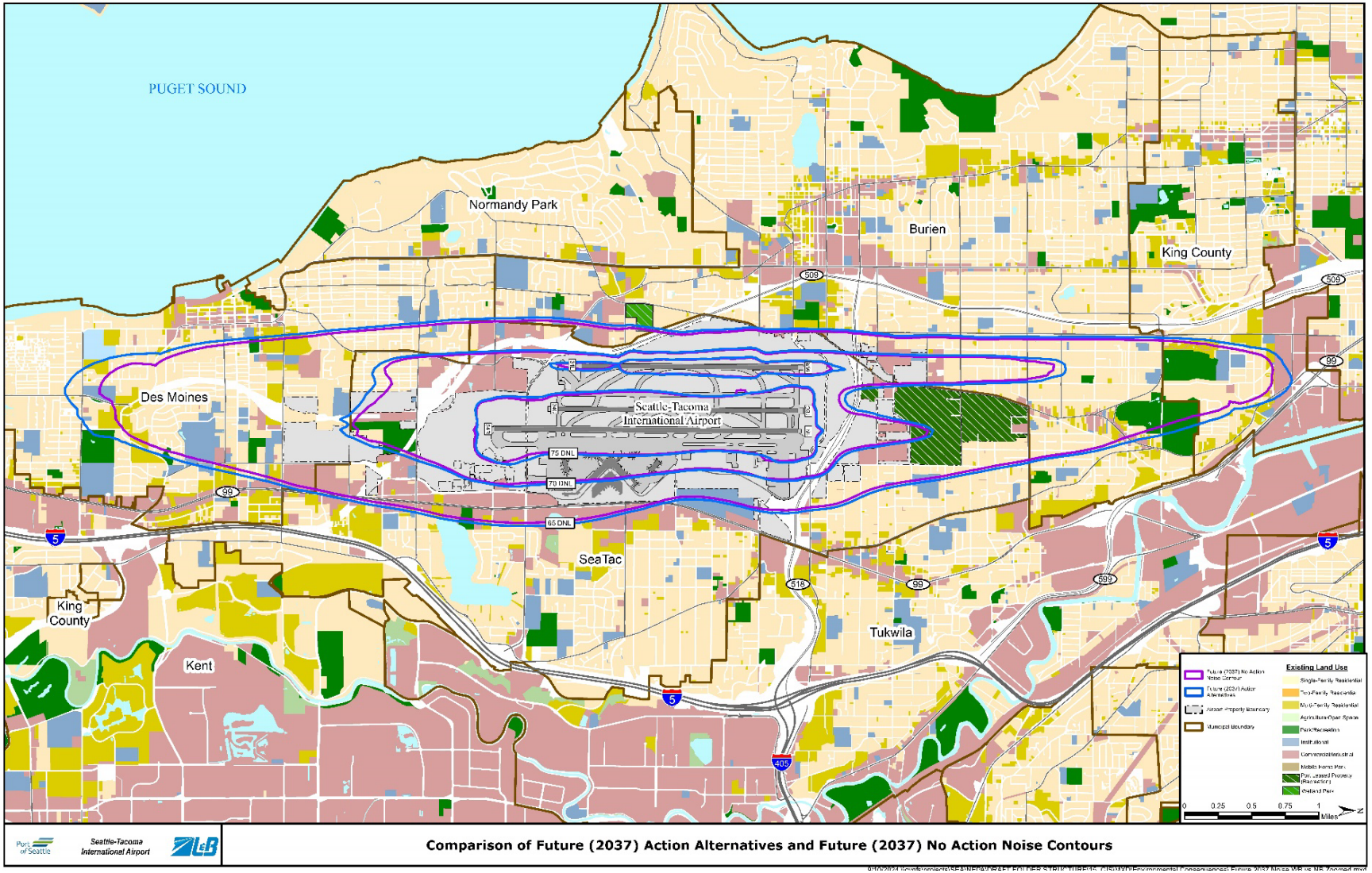
Mitigation

Because no significant impacts related to noise or noise-compatible land use would occur, no mitigation is necessary.

Minimization Measures

The Port has initiated a Part 150 Study Update, which is a separate process. This study will evaluate incompatible land uses and their eligibility for inclusion in the Port's noise remedy program.

EXHIBIT 4-3: COMPARISON OF FUTURE (2037) ACTION ALTERNATIVES AND FUTURE (2037) NO ACTION NOISE CONTOURS



Sources: AEDT Version 3f; Landrum & Brown analysis, 2024

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4.3.10.4 Construction Noise

Based on a screening analysis, a detailed construction noise assessment was completed for NTPs C02 and C03 as the projects are directly adjacent to residential properties (see **Appendix J**). The residential properties are located east of 24th Avenue S., west of 30th Avenue S., and south of S. 148th Street. Construction for C02 would start in 2026 (lasting approximately 18 months) and construction for C03 would start in 2028 (lasting around 16 months). Major construction activities are anticipated to be limited to daylight hours and the Port has construction requirements that help to minimize noise levels near construction sites.

The assessment determined noise from construction may occasionally exceed ambient noise levels and be noticeable to residential properties. For C02, there are 13 residential properties that would experience a noticeable increase (over 3 dB) in construction noise intermittently during construction. The longest continuous duration would be approximately 18 weeks. For C03, there are eight residential properties that would experience a noticeable increase (over 3 dB) in construction noise periodically during construction. The longest duration would be approximately 26 weeks. The short-term increase in noise during construction would be temporary. Construction-related noise increases would be minimized through strict adherence to the Port's Construction General Requirements and by meeting State of Washington and City of SeaTac requirements. Contractors will also utilize BMPs to reduce noise impacts. In addition, most of the residential properties, adjacent to the C02 and C03 sites that would experience a noticeable temporary noise increase, have received sound insulation through the Port's Sound Insulation Program which reduces the noise that enters the interior of the structure.

Mitigation and Minimization Measures

Mitigation

Because no significant impacts related to construction noise would occur, no mitigation is necessary.

Minimization Measures

Construction-related noise increases would be minimized through strict adherence to the Port's Construction General Requirements and by meeting State of Washington and City of SeaTac requirements. Contractors will also utilize BMPs to reduce construction noise.

4.3.11 Socioeconomics, Environmental Justice, and Children's Health and Safety Risks

This section presents the results of the analysis of potential reasonably foreseeable socioeconomic impacts and children's environmental health and safety risks that would occur as a result of the Proposed Action and alternatives. This section summarizes information and analysis included in **Appendix L** as well as **Appendix C**, **Appendix H**, and **Appendix J**.

4.3.11.1 Socioeconomic Impacts

Significant Impact Threshold

The FAA has not established a significance threshold for socioeconomic impacts. However, the FAA has identified several factors to consider, including the degree to which the action would have the potential to:

- Induce substantial economic growth in an area, either directly or indirectly (e.g., through establishing projects in an undeveloped area);
- Disrupt or divide the physical arrangement of an established community;
- Cause extensive relocation when sufficient replacement housing is unavailable;

- Cause extensive relocation of community businesses that would cause severe economic hardship for affected communities;
- Disrupt local traffic patterns and substantially reduce the levels of service of roads serving an airport and its surrounding communities (see Section 4.3.12 Surface Transportation); or
- Produce a substantial change in the community tax base.

Alternative 1: No Action

Induced Economic Growth / Substantial Loss in Community Tax Base

The No Action would experience economic growth due to the increase in forecasted passengers, although a smaller increase than the other alternatives. Additional passengers would mean an increase in Airport revenue, concessions and retail related revenue, and visitor related revenue to the region from lodging, food / beverage, entertainment, or shopping. While the economic impact of the No Action has not been quantified, it is likely that it would result in less gross tax revenue than the other alternatives, but it would likely not produce a substantial change in the community tax base.

Division of Established Communities

The No Action Alternative would not result in the division of communities.

Relocation of Residences / Relocation of Businesses

The No Action Alternative would not require the relocation of residences or businesses.

Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

Induced Economic Growth / Substantial Loss in Community Tax Base

The Action Alternatives would support long-term economic growth for the Puget Sound region and the area near SEA by providing facilities necessary to accommodate future passenger and cargo growth. The proposed Second Terminal would directly create new airline support jobs (such as ticket counter agents, gate attendants, etc.), new restaurant and retail jobs (for the new food and shopping establishments), and new jobs associated with operation and maintenance of the new facilities. Temporary growth in economic activity for local businesses would occur from the creation of construction jobs and supporting businesses. Additional indirect growth in economic activity may occur from passengers using nearby hotels, restaurants, etc. The overall effect to the economic environment of the GSA would be beneficial and no adverse impacts to economic resources are expected.

Division of Communities

The construction and implementation of the Action Alternatives would occur on existing Port-owned property. There would be no land acquisition. Although new facilities north of SR 518, such as the proposed cargo warehousing (C02 and C03), would be located on the periphery of existing residential communities, they would not displace any residents or key amenities of those communities. As part of the proposed cargo warehousing, access to 24th Avenue S. from S. 150th Street would likely be eliminated. While final design of the proposed cargo warehousing would be needed to determine if the access would be eliminated, the analysis in this EA assumed the access was eliminated to disclose the potential impacts. Drivers wanting to access 24th Avenue S. from S. 150th Street would have to utilize S. 152nd Street or S. 148th Street. This would add a maximum of 0.75 miles to the trip compared to the current access. While this would result in slightly longer drives for approximately 60 homes located along the western portion of S. 150th Street, there would be reasonable alternative routes, and this would not be considered a significant division of this community. Therefore, the Action Alternatives would not result in significant impacts related to division of communities.

Relocation of Residences / Relocation of Businesses

Neither alternative would result in the relocation of residences. The Doug Fox Lot and PACCAR Aviation would be directly impacted by the Action Alternatives. Each of these is described below:

Doug Fox Lot: The Doug Fox Lot, which is a parking business that leases Port-owned property, would be closed due to the proposed construction of the Second Terminal and parking garage. The Port would either not renew the lease (set to expire in June 2026) or would exercise termination rights within the lease. There are numerous other parking options near SEA for passengers to use, including the proposed parking garage. The approximately 25 Doug Fox Lot employees would likely find replacement employment with Port offered employment assistance. While this would result in the loss of revenue for the operator of the Doug Fox Lot, this is not considered a significant economic impact and the loss of parking would largely be replaced by the new parking structure (T02).

PACCAR Aviation: PACCAR Aviation, located off Starling Drive, has approximately 14 employees at this location to support the company's corporate aviation functions. This facility would close due to the proposed construction of the ARFF. The Port would either not renew the lease or would exercise termination rights within the lease. It is anticipated that the business and employees would relocate to another airport in the region. While this would result in the termination of the lease for PACCAR at this site, this is not considered a significant economic impact due to the scale of the operation and the ability of the employees to be relocated.

Mitigation and Minimization Measures

Mitigation

No significant impacts to socioeconomic resources would occur as a result of implementing the Action Alternatives. Therefore, no mitigation for socioeconomic impacts would be necessary.

Minimization Measures

The Port will offer the approximately 25 Doug Fox Lot employees employment assistance.

4.3.11.2 Environmental Justice

Since the publication of the Draft EA, EOs 12898, 13985, 14091, and 14096 were revoked on January 20, 2025. On January 21, 2025, President Trump issued EO 14173, *Ending Illegal Discrimination and Restoring Merit-Based Opportunity*. In addition, CEQ revoked its regulations (40 CFR parts 1500-1508) implementing NEPA, 42 U.S.C. 4321 *et seq*., as amended, in response to EO 14154. Consequently, it is no longer a legal requirement or the policy of the federal government to conduct environmental justice analyses. As a result, this Final EA has removed the prior discussion of, and data/analysis related to, environmental justice.

4.3.11.3 Children's Environmental Health and Safety Risks

Significant Impact Threshold

The FAA has not established a significance threshold for children's environmental health and safety risks. However, the FAA has identified a factor to consider when evaluating potential impacts: whether the action has the potential to lead to a disproportionate health or safety risk to children. The existence of this factor does not necessarily establish a significant impact; rather, the FAA must evaluate this factor in light of context and intensity to determine if there are significant impacts.

Alternative 1: No Action

The No Action Alternative is not anticipated to result in impacts related to children's environmental health and safety.

Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

The Action Alternatives would not result in significant changes to health and safety risks including air, food, drinking water, recreational waters, soil, or products children may use or to which they would be exposed. The Action Alternatives could result in non-permanent noise impacts during construction of the proposed cargo development (C02 and C03). No schools are located in areas where impacts are identified; however, children living in these residential areas may experience temporary increases in noise during construction. No significant noise impacts were identified, and there are no separate noise impact standards for children. The Action Alternatives would not increase health and safety risks attributable to products or substances that a child is likely to encounter or ingest, such as air, food, water, recreational waters, soil, or products they may be exposed to; consequently, the Action Alternatives would not result in health and safety risks to children when compared to the No Action Alternative.

Mitigation and Minimization Measures

Mitigation

Because no significant impacts to children's environmental health and safety were identified, no mitigation is necessary.

Minimization Measures

Minimization measures (fencing project areas, removal / disposal of contaminated materials / soils in accordance with federal, state, and local requirements) and BMPs would be used to minimize impacts during construction.

4.3.12 Surface Transportation

This section describes the results of the surface transportation study analyzing the potential reasonably foreseeable effects of the Proposed Action and alternatives. More information about the analysis and the results can be found in **Appendix L**.

4.3.12.1 Significant Impact Threshold

The FAA has not established a significance threshold for surface transportation. However, the FAA does consider the degree to which the action would have the potential to disrupt local traffic patterns and substantially reduce the LOS of roads serving an airport and its surrounding communities. FAA Order 1050.1F indicates that this is not a threshold and FAA must evaluate these factors considering context and intensity to determine if there are significant impacts.

4.3.12.2 Surface Transportation Impacts

The surface transportation study evaluated 114 intersections within the STSA for the No Action and 111 intersections for the Action Alternatives to identify roadway intersections that would fail to meet local and agency mobility standards in 2032 and 2037.

Alternative 1: No Action

By 2032, nine of the roadway intersections analyzed would fail to meet mobility standards under the No Action and 17 of the roadway intersections would fail under the 2037 No Action. These degradations would be due to background growth in traffic and / or travel pattern changes unrelated to the Action Alternatives.

Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

The Action Alternatives analysis assumed the SR 509 Phase 2 extension and transportation and infrastructure projects would be constructed by 2032. The intersections were sorted into one of four categories depending on the results of the analysis:

- Category 1: Intersection has a LOS deficiency because of additional trips added by the Action Alternatives. Four intersections in 2032 and eight intersections in 2037 were Category 1 intersections.
- Category 2: Intersection has a LOS deficiency in No Action, but Action Alternatives would increase delay. Eleven intersections in 2032 and 18 intersections in 2037 were Category 2 intersections.
- Category 3: Intersection meets the mobility standard in both No Action and Action Alternatives even after additional delay from Action Alternatives trips. Sixty-three intersections in 2032 and 54 intersections in 2037 were Category 3 intersections.
- Category 4: Intersection delay improves or does not change with the Action Alternatives. Thirty-eight intersections in 2032 and 36 intersections in 2037 were Category 4 intersections.

Table 4-34 and Table 4-35 show the Category 1 and Category 2 intersections for 2032 and 2037.[59] Category 1 intersections were considered significant impacts and require mitigation.

TABLE 4-34: CATEGORY 1 INTERSECTIONS

ID - Intersection	Jurisdiction /Agency	Mobility Standard	2032 NA LOS	2032 PA LOS	Change in Delay (sec)	2037 NA LOS	2037 PA LOS	Change in Delay (sec)
14 - Des Moines Mem. Drive/S 144th Street	SeaTac (Burien)	E	E	F	201.3	E	F	222.1
17 - 24th Ave. S/S 146th St	SeaTac	D	C	E	22.8	D	F	47.3
24 - SR 518 WB Ramps/ Des Moines Mem. Drive	WSDOT	D	C	E	20.7	Cat.2	Cat.2	Cat.2
42 - SR 518 EB Off-Ramp/51st Ave. S.	WSDOT	D	Cat. 3	Cat. 3	Cat. 3	D	E	11.3
48 - 8th Ave. S./S. 156th St	SeaTac	E	Cat. 3	Cat. 3	Cat. 3	E	F	120.1
83 - Military Rd. S. / SB I-5 Ramps/S. 200th Street	WSDOT	D	Cat. 3	Cat. 3	Cat. 3	D	E	9.9
86 - Military Rd. S./NB I-5 Ramps	WSDOT	D	D	E	16.8	Cat.2	Cat.2	Cat.2
96 - 16th Ave. S/S 144th St	SeaTac	D	Cat. 3	Cat. 3	Cat. 3	B	E	30.6
98 - Des Moines Memorial Drive/S 168th Street	Burien	C	Cat. 3	Cat. 3	Cat. 3	C	D	9.9

Notes: NA = No Action, PA = Proposed Action, LOS = Level of Service, Delay (seconds).

[59] Based on coordination with WSDOT, Burien, Des Moines, and Tukwila Category 3 intersections would not require mitigation. Category 3 impacts in the City of SeaTac will be mitigated according to the ILA between the Port and the City of SeaTac.

TABLE 4-35: CATEGORY 2 INTERSECTIONS

ID - Intersection	Jurisdiction / Agency	Mobility Standard	2032 NA LOS	2032 PA LOS	Change in Delay (sec)	2037 NA LOS	2037 PA LOS	Change in Delay (sec)
102 – S. 152nd Street /Des Moines Memorial Drive S.	SeaTac (Burien)	E	Cat. 3	Cat. 3	Cat. 3	D	F	24.0
21 - SR 509 SB Ramps/SW 148th Street	WSDOT	D	Cat. 3	Cat. 3	Cat. 3	E	E	11.8
23 - SR 518 EB Ramps/ Des Moines Mem. Drive	WSDOT	D	F	F	344.1	F	F	719.6
24 - SR 518 WB Ramps/ Des Moines Mem. Drive	WSDOT	D	Cat. 1	Cat. 1	Cat. 1	E	F	150.8
28 - SR 518 EB Ramps/S. 154th Street	WSDOT	D	F	F	6.8	F	F	21.2
33 - SR 518 WB Off-Ramp (Loop) / S. 154th Street	WSDOT	D	F	F	78.9	F	F	115.0
37 - International Blvd./S. 154th Street	WSDOT	E-Mitigated	F	F	2.2	F	F	4.6
49 - 1st Ave. S/SW 160th Street	Burien	D	E	E	0.4	E	E	1.4
54 - Host Rd./SR 518 On-Ramp / S. 160th Street	SeaTac/ Burien	E	Cat. 3	Cat. 3	Cat. 3	F	F	68.3
78 - NB I-5 Ramps/S. 188th Street	WSDOT	D	E	E	1.6	F	F	2.4
86 - Military Rd. S./NB I-5 Ramps	WSDOT	D	Cat. 1	Cat. 1	Cat. 1	E	F	16.6
89 - Pacific Hwy S./S. 216th Street	Des Moines	F (v / c 1.0)	E	E	0.2	E	E	1.6
93 - Pacific Hwy S./SR 516	Des Moines	F (v / c 1.2)	F	F	3.4	F	F	3.8
94 - SB I-5 Ramps/SR 516	WSDOT	D	Cat. 3	Cat. 3	Cat. 3	E	E	6.8
101 - 8th Ave. S./Des Moines Memorial Drive S.	Burien/ SeaTac	D / E	F	F	150.7	F	F	227.4
105 - 32nd Ave. S./S. 160th Street	SeaTac	E	F	F	47.2	F	F	72.4
106 - Military Rd. S./S. 164th Street/42nd Ave. S.	SeaTac	E	Cat. 3	Cat. 3	Cat. 3	F	F	5.5
107 - 34th Ave. S./S. 170th Street	SeaTac	E	Cat. 4	Cat. 4	Cat. 4	F	F	0.7
109 - Military Rd. S./S. 216th Street	SeaTac	E	F	F	7.0	F	F	9.8

Notes: NA = No Action, PA = Proposed Action, LOS = Level of Service, Delay (seconds).
Source: SAMP Environmental Review – Future Conditions Traffic Analysis Summary (Concord, 2024); included in Appendix L.

Mitigation and Minimization Measures

Mitigation

Mitigation was proposed for Category 1, Category 2, and Category 3[60] intersections according to each jurisdiction's requirements. Meetings were held with the local jurisdictions to present the results and proposed mitigation. Based on the meetings and coordination with the local jurisdictions, the proposed mitigation for Category 1 intersections is shown in **Table 4-36**. The proposed mitigation for Category 2 intersections is shown in **Table 4-37**.

TABLE 4-36: PROPOSED MITIGATION FOR CATEGORY 1 INTERSECTIONS

ID	Intersection	Jurisdiction / Agency	Proposed Mitigation	Future LOS with Mitigation (2032 / 2037)
98	Des Moines Memorial Drive at S. 168th Street	City of Burien	Construct new signal, provide dedicated westbound left turn lane, and provide shared WB through and right turn lane. Westside Trail will be maintained or improved and no change in access would occur with the proposed mitigation.	A / B
14	Des Moines Mem. Drive at S. 144th Street	City of SeaTac	Widen east leg to provide a WB left turn lane, widen south leg to provide a northbound right turn lane, and modifications to the traffic signal. Westside Trail will be replaced in-kind or improved and no change in access would occur with the proposed mitigation.	D / D
17	24th Ave. S. at S. 146th Street	City of SeaTac	Construct a signal and add leading protected northbound left turn phase.	B / B
48	8th Ave. S. at S. 156th Street	City of SeaTac	Shift southbound lanes west to add dedicated southbound left and right turn lanes, add dedicated northbound left turn lane, and modify signal timing with protected left turns for all approaches. Westside Trail will be replaced in-kind or improved and no change in access would occur with the proposed mitigation.	D / E
96	16th Ave. S. at S. 144th Street	City of SeaTac	Construct an eastbound right turn lane.	C / C
102	S. 152nd Street at Des Moines Memorial Drive S.	City of SeaTac	Construct single leg roundabout to consolidate three intersections (100, 101, and 102). Westside Trail will be maintained or improved and no change in access would occur with the proposed mitigation.	A / A

[60] The ILA between the Port and the City of SeaTac requires mitigation for projects outside the AAA, therefore mitigation is proposed for those Category 3 intersections.

TABLE 4-36: PROPOSED MITIGATION FOR CATEGORY 1 INTERSECTIONS (CONTINUED)

ID	Intersection	Jurisdiction / Agency	Proposed Mitigation	Future LOS with Mitigation (2032 / 2037)
24	SR 518 WB Off-ramp at Des Moines Mem. Drive	WSDOT	Construct single lane roundabout where WB approach would be converted to a left turn lane and yield right turn lane. Westside Trail will be replaced in-kind or improved and no change in access would occur with the proposed mitigation.	A / A
42	SR 518 EB Off-ramp & 51st Avenue S.	WSDOT	WSDOT is not requiring mitigation at this intersection.	N/A
83	Military Rd. S. at Southbound I-5 Ramps at S. 200th Street	WSDOT	WSDOT is not requiring mitigation at this intersection.	N/A
86	Military Rd. S. at Northbound I-5 Ramps	WSDOT	WSDOT is not requiring mitigation at this intersection.	N/A

Note: No Category Type 1 impacts occurred in the City of Des Moines or the City of Tukwila.
Source: SAMP Environmental Review – Future Conditions Traffic Analysis Summary (Concord, 2024); included in Appendix L.

TABLE 4-37: PROPOSED MITIGATION FOR CATEGORY 2 INTERSECTIONS

ID	Intersection	Jurisdiction / Agency	Proposed Mitigation	Future LOS with Mitigation (2032 / 2037)
49	1st Ave S. at SW 160th Street	City of Burien	Pay proportionate share of corridor improvement costs equal to the percentage of total intersection trips generated by NTPs in 2037 (1%). Corridor improvement is included as Project #22 on Burien's TIP.	N/A
89	Pacific Hwy S. at S. 216th Street	City of Des Moines	No Port mitigation is identified. City stated mitigation for intersection #93 covers this intersection as well.	N/A
93	Pacific Hwy S. at SR 516	City of Des Moines	Pay proportionate share for delay added by NTP trips based on the total number of PM peak hour trips added to intersection #93 and the City's traffic impact fee schedule.[61]	N/A
54	Host Rd. at S. 160th Street / SR 518 Eastbound On-ramp	City of SeaTac	Construct a signal.	A / A
101	8th Ave S. at Des Moines Memorial Drive	City of SeaTac	Construct a roundabout that would consolidate three intersections (100, 101, and 102).	A / A
105	34th Ave S. at S. 160th Street	City of SeaTac	Construct a roundabout.	A / A

[61] The City of Des Moines' current traffic impact fee amount is $7,651.41 per PM peak hour trip.

TABLE 4-37: PROPOSED MITIGATION FOR CATEGORY 2 INTERSECTIONS (CONTINUED)

ID	Intersection	Jurisdiction / Agency	Proposed Mitigation	Future LOS with Mitigation (2032 / 2037)
106	Military Rd S. at S. 164th St at 42nd Ave S	City of SeaTac	Pay proportionate share of roundabout construction costs equal to the percentage of total intersection trips generated by NTPs in 2037 (4%). Constructed costs would be based on project costs identified for Project ST 116 in the City of SeaTac's Transportation Master Plan.	N/A
107	34th Ave S. at S. 170th Street	City of SeaTac	Pay proportionate share of corridor improvement costs equal to the percentage of total intersection trips generated by NTPs in 2037 (1%). Constructed costs would be based on project costs identified for Project ST 016 in the City of SeaTac's Six-Year TIP.	N/A
109	Military Rd S. at S. 216th Street	City of SeaTac	Pay proportionate share of channelization improvement costs equal to the percentage of total intersection trips generated by NTPs in 2037 (2%). Constructed costs would be based on project costs identified for Project ST 140 in the City of SeaTac's Six-Year TIP.	N/A
21	SR 509 SB Ramps at SW 148th Street	WSDOT	WSDOT is not requiring mitigation at this intersection.	N/A
23	SR 518 EB Ramps and Des Moines Memorial Drive	WSDOT	Construct a roundabout. Design of the intersection will accommodate the West Side Trail connection along the east side of Des Moines Memorial Drive S. The Westside Trail will be replaced in-kind or improved and no change in access would occur with the proposed mitigation.	A / A
28	SR 518 EB Off-Ramp at S. 154th St	WSDOT	WSDOT is not requiring mitigation at this intersection.	N/A
33	SR 518 WB Ramp at S. 154th St	WSDOT	Construct a signal.	C / C
37	International Blvd at S. 154th Street	WSDOT	WSDOT is not requiring mitigation at this intersection.	N/A
78	Northbound I-5 Ramps at S. 188th St	WSDOT	WSDOT is not requiring mitigation at this intersection.	N/A
94	Southbound I-5 Ramps at SR 516	WSDOT	WSDOT is not requiring mitigation at this intersection.	N/A

Source: SAMP Environmental Review – Future Conditions Traffic Analysis Summary (Concord, 2024); included in Appendix L.

In addition, mitigation for Category 3 intersections in the City of SeaTac will be provided in accordance with the ILA between the City of SeaTac and the Port.

With the proposed mitigation, none of the impacted intersections would experience a significant impact. As previously mentioned, mitigation was coordinated with the jurisdictions and will be completed by 2032.[62] The Port and the local jurisdictions are in the process of formalizing the mitigation commitments in a MOU with each of the jurisdictions. More detail on each intersection, improvements recommended and coordination with the local jurisdictions can be found in **Appendix L**.

Minimization Measures

Minimization measures and BMPs would be used to minimize surface transportation impacts during construction of the Action Alternatives. This includes designated truck routes or flaggers directing traffic.

4.3.13 Visual Effects

This section describes the results of the visual effect impact analysis of the reasonably foreseeable effects of the Proposed Action and alternatives.

4.3.13.1 Significant Impact Threshold

The FAA has not established a significance threshold for visual effects, but they have identified factors to consider when evaluating the potential impacts related to light emissions and visual character. If these factors exist, the FAA must evaluate these factors considering context and intensity to determine if there are significant impacts. Factors to consider for light emissions and visual resources / visual character, include, but are not limited to:

Light Emissions:

The degree to which the action has the potential to:

- Create annoyance or interfere with normal activities from light emissions; or
- Affect the visual character of the area due to the light emissions, including the importance, uniqueness, and aesthetic value of the affected visual resources.

Visual Resources / Visual Character:

The potential that the action would:

- Affect the nature of the visual character of the area, including the importance, uniqueness, and aesthetic value of the affected visual resources;
- Contrast with the visual resources and / or visual character in the study area; or
- Block or obstruct the views of visual resources, including whether these resources would still be viewable from other locations.

[62] Reference to the MOU agreements with each jurisdiction.

4.3.13.2 Light Emissions

Alternative 1: No Action

The No Action Alternative would not create additional lighting sources or modify the activities associated with existing sources; consequently, no changes in light emissions would occur.

Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

As described in **Appendix H**, the Port's ILA with the City of SeaTac regulates land uses differently based on whether the land is within the AAA, within the AAA but adjacent to public right-of-way, public property owned by another agency, or privately owned property (Edge Properties), or outside the AAA. Each category of land use has its own specific requirements related to lighting and visual screening.

The Action Alternatives would include development that would provide new sources of light emissions from the illumination of the proposed new buildings and parking areas. Most of the projects would be built inside the AAA. Given the extensive lighting that is already present on the airfield, most of the Action Alternatives would not be distinguishable from the ambient light of SEA and therefore would have no impact on light emissions. However, portions of the Action Alternatives would be on Edge Properties (**Table 4-38**). These include:

- S07 – Westside Maintenance Campus
- S08 – Airline Support (North)
- L01 – NAE Relocation (southbound lanes)
- L02 – Elevated Busway & Stations
- L03 – Second Terminal Roads / Curbside
- L04 – Northeast Ground Transportation Center (NE GTC)
- T02 – Second Terminal and Parking

TABLE 4-38: EFFECTS FROM LIGHT EMISSIONS – EDGE PROPERTIES

Project Element	POTENTIAL EFFECTS
S07 – Westside Maintenance Campus	Although there are no residential properties on the east side of SR 509 in the vicinity of this project, there are some homes immediately west of the road, approximately ¼ mile away from the proposed maintenance campus. Because the Westside Maintenance Campus would be in an elevated position on the edge of Port property, there is potential that new lighting sources could be visible from certain vantage points at these residential properties. However, given the distance this new light source would be from these properties, it would not create additional annoyances or interfere with normal activities.
S08 – Airline Support (North)	Proposed building would be in an active cargo area of the Airport that is currently illuminated by high mast light poles with downward pointing lights. Additional building related light would be indistinguishable to offsite receptors. Therefore, it would not create additional annoyances or interfere with normal activities.
L01 – NAE Relocation (southbound lanes)	Proposed improvements would be located along an existing roadway that is currently illuminated with standard street lighting, with downward pointing lights. Additional roadway lighting would be indistinguishable to offsite receptors. Therefore, it would not create additional annoyances or interfere with normal activities.
L02 – Elevated Busway & Stations	Proposed busway and stations would be located along a corridor that is currently illuminated with standard street lighting and high mast light poles, each with downward pointing lights. Additional busway and station lighting would be indistinguishable to offsite receptors. Therefore, it would not create additional annoyances or interfere with normal activities.
L03 – Second Terminal Roads / Curbside	Proposed Second Terminal roads / curbside would be located along an area that is currently illuminated with standard street lighting and parking lot light fixtures located within the Doug Fox Lot. Because the new roads / curbside would include above-grade lanes and associated lighting on the edge of Port property, it is likely that new lighting sources would be visible from adjacent properties. However, those properties are primarily commercial uses with their own lighting. Therefore, it would not create additional annoyances or interfere with normal activities.
L04 – Northeast Ground Transportation Center (NE GTC)	Proposed NE GTC would be an extension of the existing Main Parking Garage. Given the existing lighting of the garage, and the location between the Main Terminal and the existing Sound Transit station, additional lighting would be indistinguishable to offsite receptors. Therefore, it would not create additional annoyances, interfere with normal activities, or adversely affect the visual character of the area.
T02 – Second Terminal and Parking	Proposed Second Terminal and parking would be in an area that is currently illuminated with standard street lighting and parking lot light fixtures located within the Doug Fox Lot. Because the new terminal and parking garage would include multiple above-grade levels on the edge of Port property, it is likely that new lighting sources would be visible from adjacent properties. However, those properties are primarily commercial uses with their own lighting. Therefore, it would not create additional annoyances or interfere with normal activities.

The changes in light intensity caused by any of these elements of the Action Alternatives on Edge Properties within and adjacent to the AAA (**Table 4-39**) would not cause significant impacts. Certain elements of the Action Alternatives would be located on Port-owned property that is outside of the AAA. Development in these areas would be subject to measures within the ILA and City of SeaTac Municipal Code. The following project elements would be located outside of the AAA:

- C02 – Offsite Cargo – Phase I
- C03 – Offsite Cargo – Phase II
- L05 – North GT Holding Lot
- L07 – Employee Parking Structure
- S10 – CRDC

TABLE 4-39: EFFECTS FROM LIGHT EMISSIONS – OUTSIDE THE AAA

Project Element	Potential Effects
C02 – Offsite Cargo – Phase I and C03 – Offsite Cargo – Phase II	Cargo warehousing elements would be located on a site that is currently undeveloped and therefore has no existing lighting. New lighting sources would be required along the proposed building and parking areas. This area is adjacent to residential properties along 26th Avenue S. and S. 152nd Street, creating the potential for lighting related impacts or annoyance. These impacts are not significant. In addition, the Port is required to implement measures within the ILA to reduce light impacts of the development. Per the ILA, the design of facilities shall comply with requirements for signage and lighting and screening for parking.
L05 – North GT Holding Lot	Proposed north GT holding lot would be located on a site that is currently undeveloped but would be situated between the existing NEPL and several industrial / commercial buildings where other sources of light are present. There are no residential or other light sensitive land uses that would have direct view of this site. Therefore, it would not create additional annoyances or interfere with normal activities.
L07 – Employee Parking Structure	Proposed employee parking structure would be located on a developed site between the existing NEPL, SR 518, and 16th Avenue S. where other sources of light are present. It would also be located directly across the street from an unlighted sports field complex, but this complex is only utilized during daylight hours. There are no residential or other light sensitive land uses that would have direct view of this site. Therefore, it would not create additional annoyances or interfere with normal activities.
S10 – CRDC	Proposed CRDC would be located on a site that is currently undeveloped but would be between the existing NEPL and several industrial / commercial buildings where other sources of light are present. There are no residential or other light sensitive land uses that would have direct view of this site. Therefore, it would not create additional annoyances, or interfere with normal activities.

Although new light sources would result from the construction of the Action Alternatives in these areas outside the AAA, no significant increase in light intensity is expected to occur due to the presence of existing light-emitting sources such as buildings, parking areas, and public roads. The changes in light intensity caused by the Action Alternatives would not cause significant impacts.

Mitigation and Minimization Measures

Mitigation

Because no significant impacts related to light emissions were identified, no mitigation is necessary.

Minimization Measures

Although no significant impacts are anticipated, certain minimization measures would be implemented. Projects constructed on non-edge properties inside the AAA would be designed in accordance with the Port's most recent Design Guidelines and Standards.[63]

4.3.13.3 Visual Resources and Visual Character

Alternative 1: No Action

The No Action Alternative would not introduce new visual elements that would change the visual character of the GSA, contrast with the visual character of the GSA, or block or obstruct views of existing visual resources. The No Action Alternative is not anticipated to result in new visual impacts.

Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

The Action Alternatives would include new Airport related development that would affect the viewshed by adding new visual features. Most of the Action Alternatives would occur within the AAA. In those locations, the intensity of this existing land use is such that many of the proposed visual elements of the Action Alternatives would be consistent with the visual character and would not significantly alter the visual setting. Some of the elements would be located on Edge Properties (**Table 4-40**), with potential to affect adjacent properties. These projects include:

- S07 – Westside Maintenance Campus
- S08 – Airline Support (North)
- L01 – NAE Relocation (southbound lanes)
- L02 – Elevated Busway & Stations
- L03 – Second Terminal Roads / Curbside
- L04 – Northeast Ground Transportation Center (NE GTC)
- T02 – Second Terminal and Parking

TABLE 4-40: EFFECTS TO VISUAL RESOURCES – EDGE PROPERTIES

Project Element	Potential Effects
S07 – Westside Maintenance Campus	There are some residential properties immediately west of SR 509, approximately ¼ mile away from the proposed maintenance campus. Because the Westside Maintenance Campus would be in an elevated position on the edge of Port property, there is potential that proposed facilities would be visible from certain vantage points at these residential properties. However, given the distance from the site, the dense tree cover, and the relatively small size of the development, no significant changes to the visual character of the area, noticeable contrasts with existing visual character, or obstructions of important visual resources are expected to occur.
S08 – Airline Support (North)	Proposed building would be in an active cargo area of the Airport and would be consistent with the visual character of this portion of the Airport. This structure would be indistinguishable to off-Airport receptors. Therefore, no significant changes to the visual character of the area, noticeable contrasts with existing visual character, or obstructions of important visual resources are expected to occur.

[63] Seattle-Tacoma International Airport Design Guidelines and Standards (2024), https://www.airportprojects.net/sampenvironmentalreview/wp-content/uploads/sites/45/2024/09/SEA-Architecture-Design-Guidelines-Standards-reduced.pdf

TABLE 4-40: EFFECTS TO VISUAL RESOURCES – EDGE PROPERTIES (CONTINUED)

Project Element	Potential Effects
L01 – NAE Relocation (southbound lanes)	Proposed roadway improvements would be located along an existing roadway and would be consistent with the visual character of this portion of the Airport. Therefore, no significant changes to the visual character of the area, noticeable contrasts with existing visual character, or obstructions of important visual resources are expected to occur.
L02 – Elevated Busway & Stations	Proposed busway and stations would be located adjacent to the existing elevated Sound Transit tracks, which have a similar visual style and characteristic. Therefore, no significant changes to the visual character of the area, noticeable contrasts with existing visual character, or obstructions of important visual resources are expected to occur.
L03 – Second Terminal Roads / Curbside	Proposed roads / curbside would be in an area with multiple roadways, overpasses, and grade separated intersections. Proposed improvements would be consistent with the visual character of this area of the Airport and indistinguishable to off-Airport viewers. Therefore, no significant changes to the area's visual character, noticeable contrasts with existing visual character, or obstructions of important visual resources are expected to occur.
L04 – Northeast Ground Transportation Center (NE GTC)	Proposed NE GTC would be an extension of the existing Main Parking Garage and would be consistent with the visual character of this portion of the Airport. Given the location of elevated roadways and the Sound Transit lines that obscure views to and from this portion of the Airport, this 5-story building would be indistinguishable to off-Airport viewers. Therefore, no significant changes to the visual character of the area, noticeable contrasts with existing visual character, or obstructions of important visual resources are expected to occur.
T02 – Second Terminal and Parking	Proposed Second Terminal and parking would be located immediately west of Washington Memorial Park cemetery that abuts the east edge of the existing Doug Fox Lot. The existing Doug Fox Lot is a surface lot, and the cemetery is partially screened from the lot by a row of landscaping and intermittent trees. The Action Alternatives would replace this surface lot with a seven-story parking structure, new terminal, and elevated terminal roadways. This would alter the visual and aesthetic character of the cemetery when looking in a south and west direction, although the overall visual character of a cemetery within a heavily developed environment would remain. While this would alter the immediate view from portions of the cemetery, it is not anticipated to be a significant negative effect as there is no connectivity in terms of the use of the cemetery and the existing view of Airport functions, and the change is not one that would result in loss of notable views. The Port would work with the cemetery to provide appropriate screening and visual context to minimize potential impacts to cemetery operations and enjoyment. In addition, the Second Terminal and parking garage would likely be visible from areas east of International Boulevard, particularly as the terrain rises. While these changes would be noticeable, the size, style and design of the structures would be consistent with the other structures visible from these areas east of International Boulevard.

Although the Action Alternatives would result in changes to the visual character of some areas by introducing new visual elements, the impacts from these new elements would be isolated, and limited to views from certain angles or vantage points. No significant changes to the visual character of the area, noticeable contrasts with existing visual character, or obstructions of important visual resources are expected to occur because of any of these elements of the Action Alternatives.

Elements of the Action Alternatives Located Outside of the AAA:

Certain elements of the Action Alternatives would be located on Port-owned property that is outside of the AAA (**Table 4-41**). Development in these areas would be subject to measures within the ILA and City of SeaTac Municipal Code. The following project elements would be located outside of the AAA:

- C02 – Offsite Cargo – Phase I
- C03 – Offsite Cargo – Phase II
- L05 – North GT Holding Lot
- L07 – Employee Parking Structure
- S10 – CRDC

TABLE 4-41: EFFECTS TO VISUAL RESOURCES – OUTSIDE THE AAA

Project Element	Potential Effects
C02 – Offsite Cargo – Phase I and C03 – Offsite Cargo – Phase II	Cargo warehousing elements would be located on a site that is currently undeveloped but adjacent to residential properties along 26th Avenue S. and S. 152nd Street. The existing site is mostly wooded, with several intersecting streets (S. 152nd Street and S. 150th Street). The Action Alternatives would alter the visual and aesthetic character of this area by clearing most of the existing trees, being replaced with cargo buildings and parking. These new buildings would be visible from the adjacent residential properties. No significant changes to the visual character of the area, noticeable contrasts with existing visual character, or obstructions of important visual resources are expected to occur. In addition, the Port is required to implement measures within the ILA to reduce visual impacts of the development, including setbacks, signage and lighting restrictions, screening for parking, and landscaping.
L05 – North GT Holding Lot	Proposed north GT holding lot would be located between existing industrial / commercial buildings in an area of limited visibility from sensitive receptors. Therefore, no significant changes to the visual character of the area, noticeable contrasts with existing visual character, or obstructions of important visual resources are expected to occur.
L07 – Employee Parking Structure	Proposed employee parking structure would include seven above-ground levels (one level below ground); however, the proposed location west of the existing NEPL would place it in an area over 2,000 feet from the nearest residential property, with intervening topography, vegetation, and buildings that would limit the degree to which the structure would be visible. Therefore, no significant changes to the area's visual character, noticeable contrasts with existing visual character, or obstructions of important visual resources are expected to occur.
S10 – CRDC	Proposed CRDC would be between existing industrial / commercial buildings in an area of limited visibility from sensitive receptors. Therefore, no significant changes to the area's visual character, noticeable contrasts with existing visual character, or obstructions of important visual resources are expected to occur.

Although new visual elements would be introduced from the construction of the Action Alternatives in these areas, the changes would not result in significant changes in the visual character of the area, noticeable contrasts with existing visual character, or obstructions of important visual resources.

Mitigation and Minimization Measures

Mitigation

Because no significant impacts related to visual resources or visual character were identified, no mitigation is necessary.

Minimization Measures

Although no significant impacts are anticipated, certain minimization measures will be implemented, where applicable according to the Airport's Landscape Vision, Design Guidelines, and Standards.[64]

4.3.14 Water Resources

This section presents the results of the analysis of potential reasonably foreseeable impacts to water resources, including wetlands, floodplains, surface waters, and groundwater that would occur because of the Proposed Action and alternatives. See **Appendix M** for more information on the inventory and analysis conducted.

4.3.14.1 Significant Impact Threshold

Exhibit 4-1 of FAA Order 1050.1F provides FAA's significance thresholds for water resources. The thresholds are shown in the following table.

Significant Impact Thresholds
Wetlands
Adversely affect a wetland's function to protect the quality or quantity of municipal water supplies, including surface waters and sole source and other aquifers
Substantially alter the hydrology needed to sustain the affected wetland system's values and functions or those of a wetland to which it is connected
Substantially reduce the affected wetland's ability to retain floodwaters or storm runoff, thereby threatening public health, safety or welfare (the term welfare includes cultural, recreational, and scientific resources or property important to the public)
Adversely affect the maintenance of natural systems supporting wildlife and fish habitat or economically important timber, food, or fiber resources of the affected or surrounding wetlands
Promote development of secondary activities or services that would cause circumstances listed above occur
Be inconsistent with applicable state wetland strategies
Surface Waters
Exceed water quality standards established by Federal, state, local, and tribal regulatory agencies
Contaminate public drinking water supply such that public health may be adversely affected
Floodplains
Cause notable adverse impacts on natural and beneficial floodplain values. Natural and beneficial floodplain values are defined in Paragraph 4.k of USDOT Order 5650.2, Floodplain Management and Protection
Groundwater
Exceed groundwater quality standards established by federal, state, local, and tribal regulatory agencies
Contaminate an aquifer used for public water supply such that public health may be adversely affected

[64] Sea-Tac International Airport Landscape Vision, Design Guidelines, and Standards (2024), https://www.airportprojects.net/sampenvironmentalreview/2024-sea-landscape-standards/.

4.3.14.2 Wetlands

Alternative 1: No Action

The No Action Alternative would not adversely affect any wetland functions, alter hydrology, or affect wetland resources, and no new impacts to wetlands would occur.

Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

Permanent Impacts to Wetlands and Wetland Buffers

The Action Alternatives would permanently impact up to 0.79 acres of jurisdictional wetlands as a result of construction related activities. Most of the individual projects in the Action Alternatives result in 0.02 acres or less of an impact and are anticipated to qualify under a Nationwide Permit. None of the impacts would exceed any of the significance thresholds established by the FAA based on the following conclusions:

- None of the impacts would adversely affect the quality or quantity of municipal water supplies (including surface waters and sole source and other aquifers) as there are no municipal water supplies derived from the drainages in which this project occurs.
- None of the impacts would substantially alter the hydrology needed to sustain the affected wetland system's values and functions or those of a wetland to which it is connected.
- None of the impacts would substantially reduce the affected wetland's ability to retain floodwaters or storm runoff, thereby threatening public health, safety or welfare (the term welfare includes cultural, recreational, and scientific resources or property important to the public).
- None of the impacts would adversely affect the maintenance of natural systems supporting wildlife and fish habitat or economically important timber, food, or fiber resources of the affected or surrounding wetlands. In addition to the minor impacts to wetlands, there would be no permanent adverse impacts to fish habitat and the minor and temporary impacts would be mitigated, supporting fish and wildlife habitat over time. There are no economically important resources that are harvested from the wetlands within the GSA.
- None of the impacts would promote development of secondary activities or services that would cause the circumstances listed above to occur. All known activities and secondary activities / services were fully included as part of the evaluation in this assessment.
- None of the impacts would be inconsistent with applicable state wetland strategies. The project impact assessment and mitigation approach are consistent with local, state and federal guidance. The mitigation would be part of a watershed level approach prepared for this basin.

Therefore, no significant wetland impacts would occur with the Action Alternatives. **Table 4-42** and **Exhibits 4-4** through **4-7** identify wetland impacts by project.

TABLE 4-42: PERMANENT JURISDICTIONAL WETLAND IMPACTS

Project Name	Wetland Impact (acres)	Wetland Size (acres)	Wetland ID
Employee Parking Structure (L07)	0.02	0.11	Wetland A
Fuel Farm Expansion (S01)	0.21	0.21	Wetland E1
Westside Maintenance Campus (S07)	<0.01	2.60	Wetland 39
Stormwater Pond (Miller Creek detention pond)	0.55*	0.55	Wetland A20
Storm (Utility Line)	0.01	3.12	Wetland 44
Storm (Utility Line)	<0.01	0.21	Wetland A14
Storm (Utility Line)	<0.01	0.55	Wetland A20
Storm (Utility Line)	<0.01	1.12	Wetland R13
Storm (Utility Line)	<0.01	0.06	Wetland R14a
Grand Total Impacted**	**0.79**		

* Future design may include a vault, reducing or eliminating this impact.
** Impact values in the table are rounded from more detailed calculations. The grand total is rounded from the calculated grand total, not the sum of the individual rounded values presented in the table. In addition, while the total impacts are summed here for analysis, any future permitting may consider the impacts of each project individually (e.g., the employee parking structure may be permitted separately from the fuel farm expansion).
Source: Sustainable Airport Master Plan (SAMP) Impacts Assessment for Aquatic Critical Areas, Parametrix (2024).

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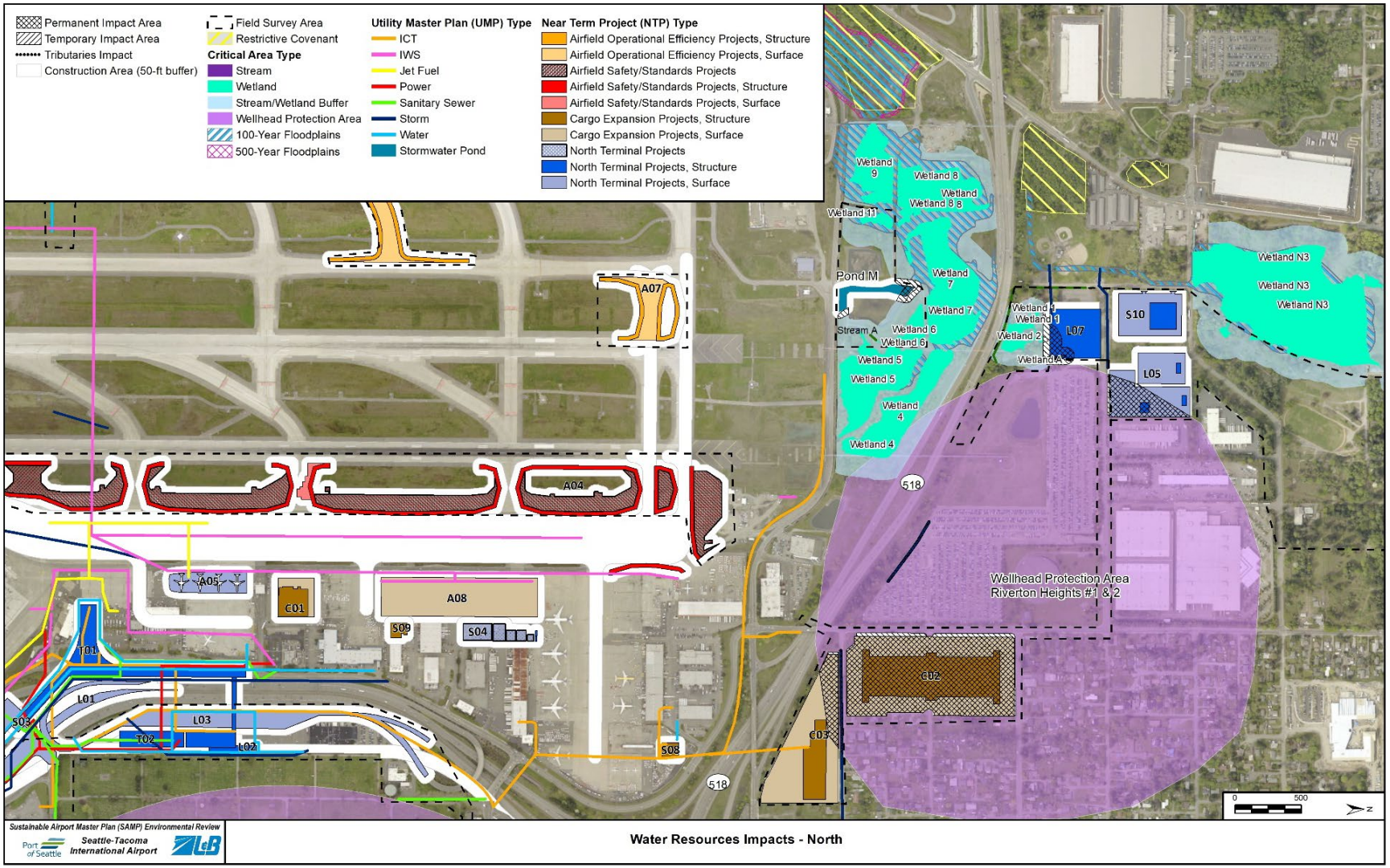
EXHIBIT 4-4: WATER RESOURCES IMPACTS – NORTH



Source: Parametrix, 2024.

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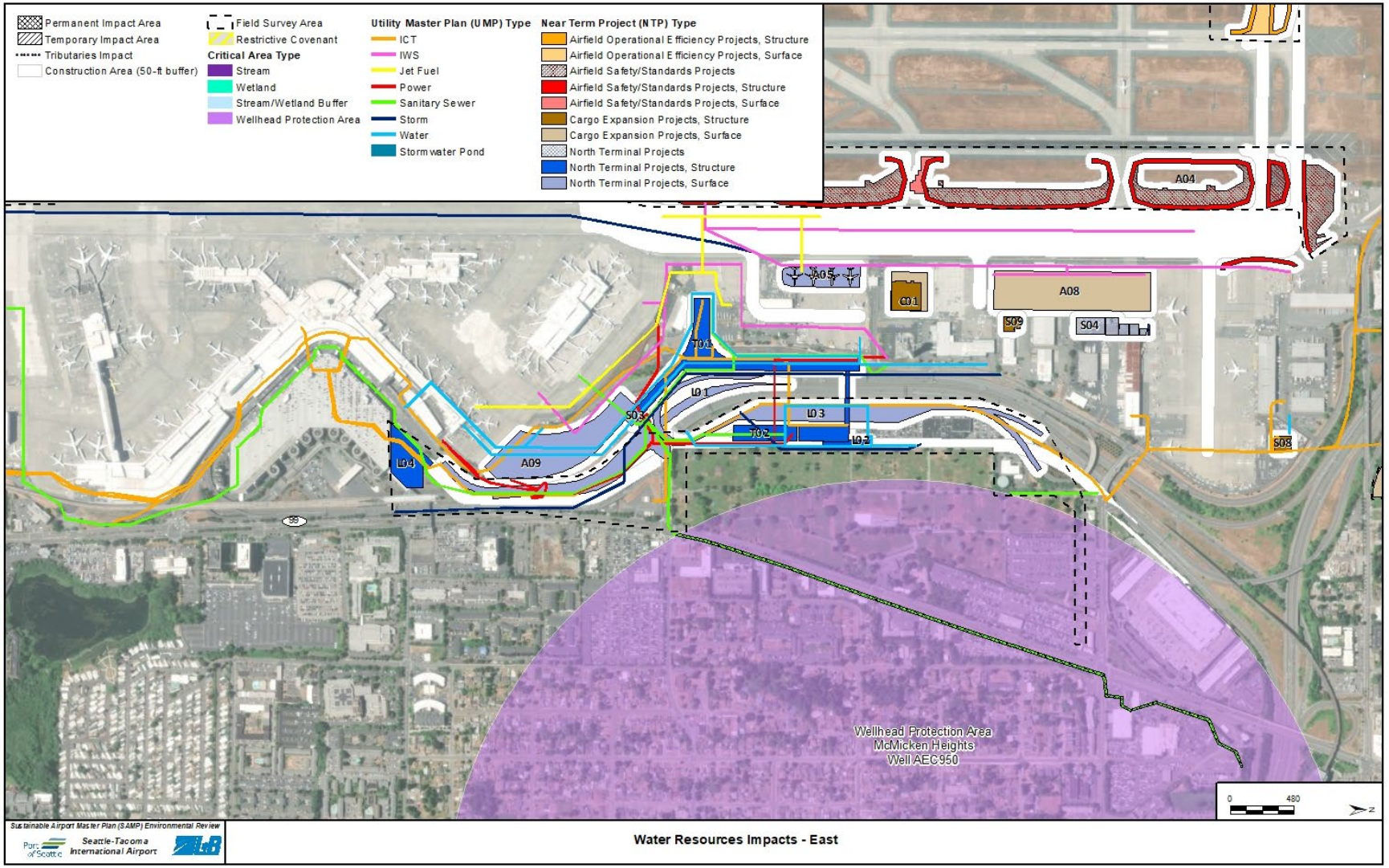
EXHIBIT 4-5: WATER RESOURCES IMPACTS – EAST



Source: Parametrix, 2024.

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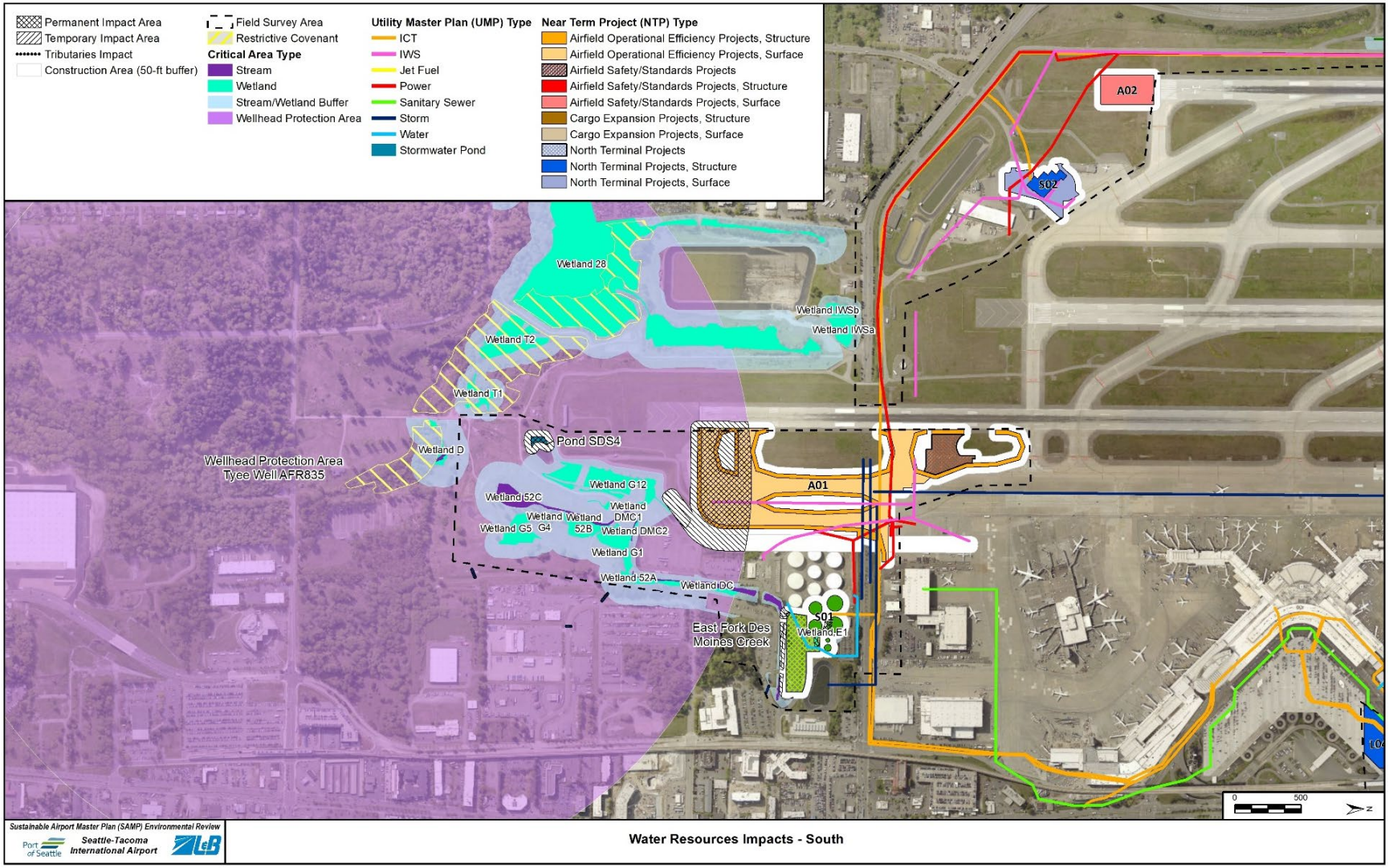
EXHIBIT 4-6: WATER RESOURCE IMPACTS – SOUTH



Source: Parametrix, 2024.

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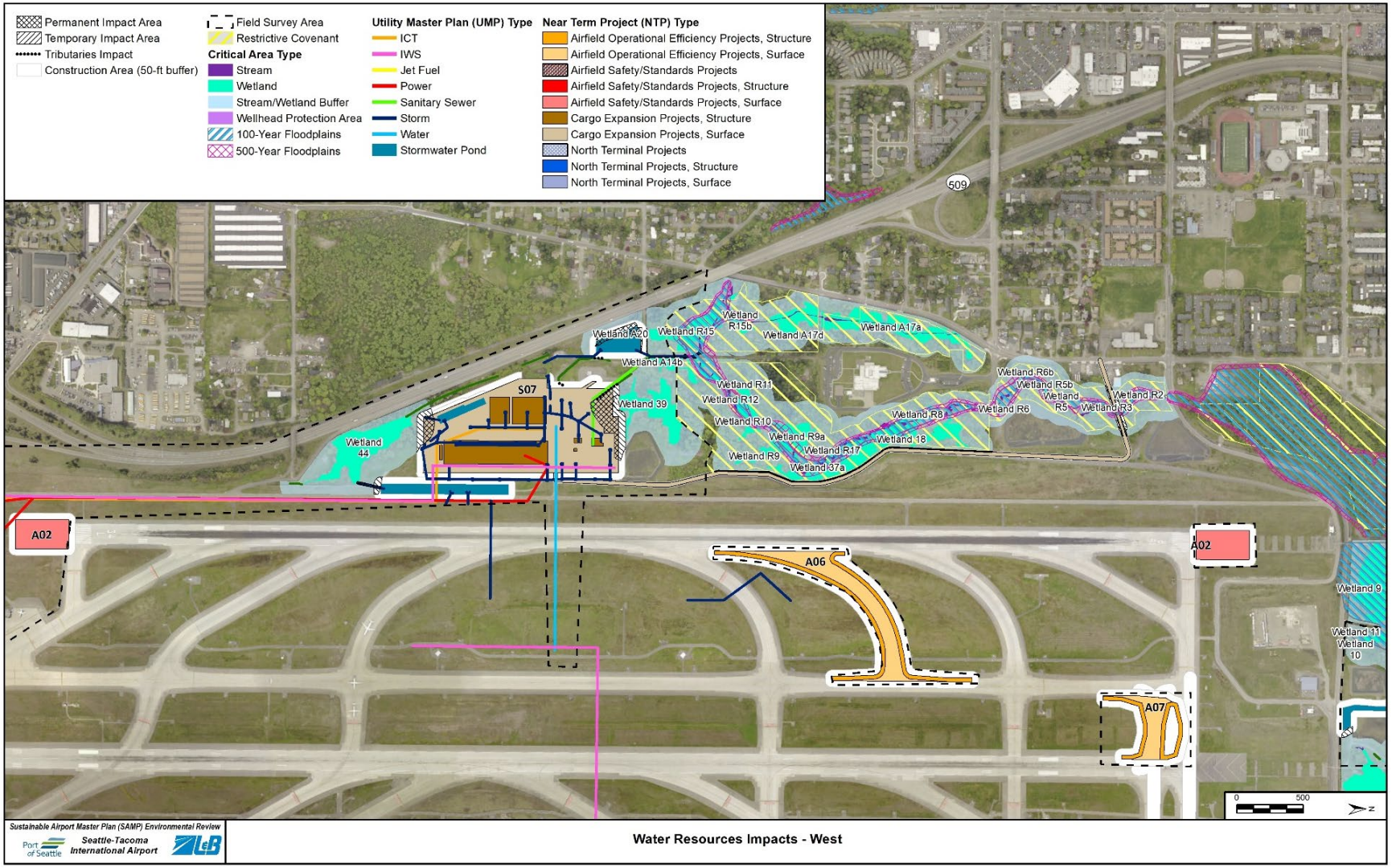
EXHIBIT 4-7: WATER RESOURCES IMPACTS – WEST



Source: Parametrix, 2024.

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The Action Alternatives would also result in total permanent wetland buffer impacts of 2.66 acres (**Table 4-43**). The requirement to provide compensatory mitigation for buffer impacts is guided by local critical area ordinances. The FAA has not established significance thresholds for impacts to wetland buffers. The determination of significance for permanent wetland impacts described above took into consideration the associated wetland buffer impacts as well. Most of the permanent wetland buffer impacts are associated with a wetland that would be impacted, for which no significant impacts were identified. The remaining permanent wetland buffer impacts for wetlands that would not be directly impacted are small and would not be considered significant impacts because they would not cause or contribute to exceedance of any of the wetland significance threshold conditions explained above.

TABLE 4-43: PERMANENT WETLAND BUFFER IMPACTS

Project Name	Wetland Buffer Impact (acres)	Wetland ID
Employee Parking Structure (L07)	0.60	Overlapping Wetlands A, 1, 2
Fuel Farm Expansion (S01)	0.01	Wetland DC
Westside Maintenance Campus (S07)	1.70	Wetlands 39, 44, R9, 37a, 18, R3, and R2
Stormwater Pond (Pond F)	<0.01	Wetland 44
Stormwater Pond (SDS4 detention pond)	<0.01	Wetland G12
Stormwater Pond (Pond M)	0.11	Overlapping Wetlands 6, 7
Sanitary Sewer (Utility Line)	0.01	Wetland 39
Storm (Utility Line)	0.23	Wetlands 44, 39, A20, A14a, A14b, Wetland 13, R15, and R15b
Grand Total*	**2.66**	

* Impacts values are rounded from more detailed calculations. The grand total is rounded from the calculated grand total, not the sum of the individual rounded values presented in the table. In addition, while the total impacts are summed here for analysis, any future permitting may consider the impacts of each project individually (e.g., the employee parking structure may be permitted separately from the fuel farm expansion).
Source: SAMP Impacts Assessment for Aquatic Critical Areas, Parametrix (2024).

Temporary Impacts to Wetlands and Wetland Buffers

The Action Alternatives would result in temporary construction impacts where wetland and wetland buffers would be affected by clearing and ground disturbing work during construction activities. These areas would be revegetated following construction and restored to their pre-construction condition. Temporary construction impacts would total 0.21 acres of wetlands and 3.43 acres of wetland buffers (**Table 4-44**). These impacts are not considered significant because they would not cause any of the significance threshold conditions described above. The temporary impacts to wetlands and buffers would occur during construction activities and would affect small, isolated wetlands with minor to no impacts on the large wetland and stream complexes in the GSA. There would be no change to water conveyance through the larger systems.

TABLE 4-44: TEMPORARY WETLAND AND WETLAND BUFFER IMPACTS

Project Name	Wetland Impact (acres)	Wetland ID	Wetland Size (acres)	Wetland Buffer Impact (acres)
Employee Parking Structure (L07)	0.02 / 0.02	Wetland A / Wetland 2	0.11 / 0.81	0.55
Fuel Farm Expansion (S01)	0.07	Wetland DC	0.54	0.35
Taxiway A//B Extension (A01)	0.0	Wetland G12	2.41	0.42
Westside Maintenance Campus (S07)	0.06 / 0.04	Wetland 39 / Wetland 44	2.60/3.10	1.41
Stormwater Pond (SDW2 / Pond F detention pond)	0.0	N/A	0.0	0.11
Stormwater Pond (SDS4 pond)	0.0	N/A	0.0	0.06
Stormwater Pond Buffer (Pond M)	0.0	N/A	0.0	0.53
Grand Total*	**0.21**	**N/A**	**N/A**	**3.43**

* Impacts values are rounded from more detailed calculations. The grand total is rounded from the calculated grand total, not the sum of the individual rounded values presented in the table. In addition, while the total impacts are summed here for analysis, any future permitting may consider the impacts of each project individually (e.g., the employee parking structure may be permitted separately from the fuel farm expansion).
N/A = Not Applicable
Source: SAMP Impacts Assessment for Aquatic Critical Areas, Parametrix (2024).

Mitigation and Minimization Measures

Mitigation

The temporary impacts to wetlands and buffers described above would be restored in-kind on-site. For permanent impacts to wetlands and associated buffers, the Port would develop a compensatory mitigation plan during the wetlands and Waters of the U.S. permitting phase, after environmental review is complete and in accordance with applicable federal and state requirements and guidelines. These guidelines are listed in the USACE and the USEPA's *Compensatory Mitigation for Losses of Aquatic Resources*,[65] and the WSDE interagency guidance contained in *Wetland Mitigation in Washington State: Parts 1 and 2*.[66]

The Port has seven sites within its ownership identified as being suitable for compensatory mitigation. Six sites are within the Airport and one site is located along the Green River in Auburn. They encompass over 150 acres and include potential for greater than 40 acres of wetland re-establishment, 11 acres of wetland enhancement, almost eight acres of preservation, and 80 acres of buffer enhancement.

Table 4-45 provides a summary of the calculated compensatory wetland mitigation requirements for the Action Alternatives, based on preliminary design and the potential unavoidable, permanent impacts to wetlands, temporary impacts to wetlands, and wetland buffer impacts and the required mitigation ratios. It is anticipated that the NTPs will comply with the compensatory mitigation ratios recommended by an interagency review committee composed of the USACE, USEPA, and WSDE.[67] For the purposes of this evaluation, it is conservatively assumed that all buffer impacts would be mitigated by reestablishing buffer in association with the wetland compensatory mitigation at a 1:1 ratio (impact to re-

[65] 33 Code of Federal Regulations (CFR) Part 332/ 40 CFR Part 230.
[66] Wetland Mitigation in Washington State Part 1: Agency Policies and Guidance https://apps.ecology.wa.gov/publications/documents/2106003.pdf and Part 2: Developing Mitigation Plans https://apps.ecology.wa.gov/publications/documents/0606011b.pdf (2006).
[67] Ibid.

establishment) resulting in 2.66 acres. **Appendix M** has additional information on the interagency recommended compensatory mitigation ratios for wetland impacts.

TABLE 4-45: COMPENSATORY WETLAND MITIGATION AREA CALCULATIONS (ACRES)

Project Element	Areas of Impact (ac / Rating)	Re-establishment Area Needed	Rehabilitation Area Needed	Enhancement Area Needed
Wetlands (permanent)[1] Facilities	0.23 / III	0.46	0.92	1.84
Wetlands (permanent)[1] Storm Lines	0.01 / III	0.02	0.04	0.08
Wetlands (permanent)[1] Utility Lines	0.01 / II	0.03	0.06	0.12
Wetlands (permanent)[1] Stormwater Ponds	0.55 / III	1.10	2.75	4.40
	Total Areas*	1.61	3.77	6.44
Wetland (temporary)[2] Facilities	0.21 / III	N/A	N/A	N/A
Wetland (temporary)[2] Storm Lines	0.00	N/A	N/A	N/A
Wetland (temporary)[2] Utility Lines	0.00	N/A	N/A	N/A
Wetland (temporary)[2] Stormwater Ponds	0.00	N/A	N/A	N/A
	Total Areas*	N/A	N/A	N/A
Wetland Buffer (permanent)[3] Facilities	N/A	2.31	2.31	2.31
Wetland Buffer (permanent)[3] Storm Lines	N/A	0.24	0.24	0.24
Wetland Buffer (permanent)[3] Stormwater Ponds	N/A	0.11	0.11	0.11
	Total Areas*	**2.66**	**2.66**	**2.66**

* Values are rounded from more detailed calculations. The grand total is rounded from the calculated grand total, not the sum of the individual rounded values presented in the table.
[1] Impacts to permanent wetlands would be permitted through the USACE.
[2] Temporary impacts to wetlands will be restored to their current state after construction.
[3] It is conservatively assumed that all buffer impacts would be mitigated at a 1:1 ratio.
Source: Parametrix analysis, 2024.

Based on these calculations, the mitigation areas identified by the Port have sufficient capacity to provide the needed compensatory mitigation to compensate for the impacts of the Action Alternatives.

Minimization Measures

Additional avoidance and minimization measures would be implemented, as practical, during project design. The Port would continue to explore options to reduce permanent wetland impacts and to minimize buffer impacts. Additional strategies would include minimizing vegetation clearing and restoring temporarily affected areas as soon after the initial impact as possible.

The Port would comply with standard specifications, BMPs,[68] and applicable federal and state mitigation requirements during design, construction, and post-construction activities. The Port would meet all regulatory requirements and continue to implement proactive avoidance and minimization measures related to these BMPs in adherence with federal and state regulations.

[68] BMPs include various methods and devices to control, remove, or reduce pollution, and are listed in the Airport's Stormwater Pollution Prevention Plan (https://www.airportprojects.net/sampenvironmentalreview/swppp-2022/). BMPs include operational practices (e.g. training and spill prevention), structural controls (e.g. stormwater ponds and oil/water separators), and erosion and sediment controls (e.g. silt fence and filter strips).

4.3.14.3 Surface Waters

Alternative 1: No Action

The No Action Alternative is not anticipated to result in new impacts to surface waters.

Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

Permanent Impacts to Streams, Stream Buffers, and Jurisdictional Ditches

The Action Alternatives would permanently impact a total of 0.01 acres of streams and 0.01 acres of potentially jurisdictional ditches as a result of construction related activities (**Table 4-46**). The ditches are considered potentially jurisdictional based on the duration of flow and the fact that they discharge to receiving waters that are under jurisdiction of the USACE. The stream impacts would be associated with a crossing of Miller Creek for an access road for the Westside Maintenance Campus. The Action Alternatives would also result in permanent stream buffer impacts totaling 0.12 acre. These impacts are not considered significant for the following reasons:

- None of the impacts would exceed water quality standards established by federal, state, local, and tribal regulatory agencies. The stream impacts would be minor (0.01 acre of stream impacts) and would occur at the eastern edge of the GSA for an access road crossing. Stream flow would be maintained throughout construction activities, and construction BMPs would limit the potential for water quality impacts. Potentially jurisdictional ditch impacts would also be minor (0.01 acre) and would feed into stormwater management facilities where the runoff would be treated along with existing surface runoff. All construction would be conducted in compliance with permit conditions, the project SWPPP, and other relevant documents.
- None of the impacts would contaminate public drinking water supply such that public health may be adversely affected.

TABLE 4-46: PERMANENT STREAM AND STREAM BUFFER IMPACTS (ACRES)

Project Name	Stream / Potentially Jurisdictional Ditch Impact	Stream ID	Stream Buffer Impact
Westside Maintenance Campus (S07)	0.01	Miller Creek	0.07
Storm (Utility Line)	0.01	Tributary 2	0.05
Grand Total*	**0.02**		**0.12**

* Impacts values are rounded from more detailed calculations. The grand total is rounded from the calculated grand total, not the sum of the individual rounded values presented in the table. In addition, while the total impacts are summed here for analysis, any future permitting may consider the impacts of each project individually (e.g., the employee parking structure may be permitted separately from the fuel farm expansion).
Source: SAMP Impacts Assessment for Aquatic Critical Areas, Parametrix (2024).

Exhibits 4-4 through **4-7** show the location of the impacted stream, stream buffer, and jurisdictional ditches.

Temporary Impacts to Streams, Stream Buffers, and Jurisdictional Ditches

Temporary stream impacts include 0.07 acres to the East Fork Des Moines Creek resulting from construction activities associated with the Fuel Farm Expansion Project (S01). Additionally, construction of the access road for the Westside Maintenance Campus (S07) would temporarily impact 0.01 acres of Miller Creek. The Action Alternatives would also result in temporary stream buffer impacts totaling 0.20 acres. These impacts are not considered significant because they would not result in any of the conditions considered significant (see significance factors above) and would only occur during certain

construction related activities. These areas would be returned to their pre-construction condition after construction activities have been completed. **Table 4-47** identifies temporary stream and stream buffer impacts by project.

TABLE 4-47: TEMPORARY STREAM AND STREAM BUFFER IMPACTS

Project Name	Stream Impact (acre)	Stream Buffer Impact (acre)
Fuel Farm Expansion (S01)	0.07	0.00
Westside Maintenance Campus (S07)	0.01	0.20
Grand Total*	**0.08**	**0.20**

* Impacts values in the table are rounded from more detailed calculations. The grand total is rounded from the calculated grand total, not the sum of the individual rounded values presented in the table. In addition, while the total impacts are summed here for analysis, any future permitting may consider the impacts of each project individually (e.g., the Westside Maintenance Campus may be permitted separately from the fuel farm expansion).

Source: SAMP Impacts Assessment for Aquatic Critical Areas, Parametrix (2024).

Potential Impacts on Stormwater Quantity and Quality

The Action Alternatives would add new impervious areas, as well as the replacement of existing impervious surfaces. Major impervious area changes include the reconfiguration of taxiways to meet safety and operational requirements, expansion of aircraft hardstand areas on the apron, expansion of the fuel farm, Westside Maintenance Campus, and the construction of new cargo and parking facilities on undeveloped sites north of SR 518. The addition of impervious surfaces would be partially offset by the demolition of select impervious surfaces along the taxiways and other hard surfaces.

The change in impervious surfaces between pre- and post-development conditions was analyzed in detail for each project footprint and within each drainage subbasin. The total impervious area within SEA's SDS and IWS drainage subbasins would increase by approximately 37 acres. An additional increase in impervious area of approximately 38 acres would be required for development within the City of SeaTac's Municipal Separate Stormwater System, including new developments north of SR 518. Overall, total impervious area at SEA would increase by approximately 75 acres.

Stormwater Drainage System: A detailed analysis was performed to evaluate the impacts of the Action Alternatives on stormwater runoff rates and assess the future demand for SDS conveyance infrastructure and stormwater control (i.e., detention and treatment) capacities. As part of this analysis, the change in impervious area within each existing subbasin was compared to available stormwater detention and treatment capacity within that subbasin, to determine the need for new or expanded stormwater controls.

This analysis accounted for the remaining capacities of existing stormwater conveyance and controls (some of which had excess capacity to address a portion of the planned development), identified deficiencies in comparison to future demand, and made recommendations for improvements to address those deficiencies. Specific recommendations were identified for each drainage basin and watershed in which development is planned, in accordance with applicable stormwater development standards (**Appendix M**).

Industrial Wastewater System: Based on the conditions for the current NPDES and Industrial Waste Department (IWD) permits, wastewater runoff rates associated with the Action Alternatives were identified, and the future demand for IWS conveyance infrastructure, storage capacity, snow storage areas, and Industrial Wastewater Treatment Plant (IWTP) infrastructure was assessed. Potential improvements to address surface water impacts and comply with applicable regulatory requirements include construction of additional detention for deicing runoff and infrastructure upgrades in the IWTP to improve treatment at higher flow rates (**Appendix M**). The Airport's NPDES and IWD permits were renewed on 9/1/2021 and 7/2/2021, respectively. There were no changes to the NPDES permit; the renewed IWD permit has two tiers of reduced effluent limits, effective 10/1/22 and 03/31/26.

City of SeaTac Municipal Separate Stormwater System: Impervious area changes within the new development areas north of SR 518 would include the implementation of new stormwater controls. With these controls, the resulting impacts are not considered significant. The resulting stormwater runoff would be treated consistent with applicable City of SeaTac stormwater management standards and Port protocols as explained below, and all new stormwater management features would be compliant with relevant permitting requirements.

With the planned measures previously described in place, the Proposed Action would not result in significant impacts to surface waters, nor would it result in an exceedance of water quality standards or contamination of public drinking water supply.

Mitigation and Minimization Measures

Mitigation

To mitigate potential impacts associated with runoff from construction activities, the Port would implement erosion and sediment control measures in accordance with applicable regulatory requirements and the Port's own construction SWPPP.[69] The Proposed Action would include appropriate measures in accordance with applicable NPDES permit requirements for discharges from construction activities. Outside of the Port's NPDES permit boundary, projects that would result in the disturbance of one or more acres and discharge stormwater to surface waters would be required to apply for coverage under the WSDE Construction Stormwater General Permit, and to implement erosion and sediment control measures and other measures as needed to comply with that permit and applicable regulatory requirements.

The Port has a Programmatic Construction SWPPP that defines requirements of SEA's construction SWMP. All projects within the permit boundary must meet the Port's Erosion and Sediment Control Plan Specification requirements, while projects meeting certain disturbance thresholds within the permit area would be required to develop project-specific construction SWPPPs and monitoring plans.

To mitigate the potential impacts to stormwater runoff quantity and quality associated with expanded impervious surfaces and grading activities, the Port would implement post-construction stormwater quantity and quality controls in accordance with applicable regulatory requirements (**Table 4-48**). Low impact development techniques and infiltration features would also be considered for implementation where feasible. Source controls would be implemented where necessary to comply with permit limits and water quality standards.

[69] Port of Seattle Master Specification Section 01 57 13 - Temporary Erosion and Sediment Control Planning and Execution, Section 01 57 23 – Pollution Prevention, Planning and Execution, and Section 01 59 00 – Construction Water Management System. These specifications would not apply to properties north of SR518. Properties north of SR518 would follow City of SeaTac code.

TABLE 4-48: PLANNED STORMWATER CONTROLS BY AREA

Drainage Basin / Area Served[1]	Stormwater Controls to be Added / Modified[2]
SDW1b	• Expand detention volume by 4.4 acre-feet. • Integrate on-site low impact development techniques as feasible. • Pursue opportunities for shallow / deep infiltration. • Provide source controls where required, including oil / water separator.
SDW2	• Relocate existing detention pond or convert to an underground vault to avoid proposed development. Provide a total storage capacity of 14.3 acre-feet (existing storage plus additional 2.4 acre-feet of storage). • Integrate on-site low impact development techniques as feasible. • Pursue opportunities for shallow / deep infiltration to offset storage requirements. • Provide source controls where required, including oil / water separator.
SDE4 & SDE4X	• Expand detention volume by up to 2.0 acre-feet. • Integrate on-site low impact development techniques as feasible. • Pursue opportunities for shallow / deep infiltration. • Provide source controls where required, including oil / water separators. • Install canisters for water quality treatment.
SDN2/3/4	• Expand detention volume by up to 4.7 acre-feet. • Integrate on-site low impact development techniques as feasible. • Pursue opportunities for shallow / deep infiltration at SR 518 pond to offset storage requirements. • Provide source controls where required.
SDS4	• Expand detention volume by 0.1 acre-feet to address development within subbasin only (assuming no diversion from SDS3 / 5). • Expand bioretention swale footprint by 90 square feet or provide equivalent detention and treatment alternative. • Integrate on-site low impact development techniques as feasible. • Pursue opportunities for shallow / deep infiltration to offset storage requirements. • Provide source controls where required.
SDD05B	• Expand detention volume by 2.3 acre-feet. • Integrate on-site low impact development techniques as feasible. • Pursue opportunities for shallow / deep infiltration to offset storage requirements. • Provide source controls where required.
SDD06A	• Expand detention volume by 6.4 acre-feet. • Integrate on-site low impact development techniques as feasible. • Pursue opportunities for shallow / deep infiltration to offset storage requirements. • Provide source controls where required.

New Development North of SR 518	• Integrate on-site low impact development techniques as feasible.
	• Pursue opportunities for shallow / deep infiltration to offset storage requirements.
	• Provide source controls where required.
	• Implement local detention facilities and water quality treatment as follows:
	  ◦ Offsite Cargo Phase 1 C02 and Offsite Cargo Phase 2 C03 – 14.1 acre-feet
	  ◦ North GT Holding Lot (L05),[3] Employee Parking (L07), and CRDC (S10)[4] – 7.7 acre-feet

1. "SDXX" nomenclature refers to drainage basin IDs within the SDS. The third character in each drainage basin ID (N / E / S / W) indicates the side of the Airport where the drainage basin is located (north / east / south / west).

2. Stormwater control needs summarized above account for available capacity remaining within existing facilities. Drainage areas that experience an increase in impervious area but are not shown in this table were found to have sufficient capacity available within existing stormwater controls.

Source: Utility Master Plan (UMP): Sewer and Surface Water, HNTB (December 2022).

Given the regulatory framework within which the Port would construct and operate the various elements of the Proposed Action and the associated mitigation requirements, there would be no significant impacts to surface waters.

Minimization Measures

The Port would comply with standard specifications, BMPs, and applicable federal and state requirements during design, construction, and post-construction activities. The Port would meet all regulatory requirements and continue to implement proactive avoidance and minimization measures related to these BMPs in adherence with federal and state regulations.

The avoidance and minimization of impacts to surface waters was and will continue to be a guiding principle for the preliminary project design. Additional avoidance and minimization measures would be implemented, as practical, during project design. The Port is exploring options to reduce or eliminate stream impacts associated with the Fuel Farm Expansion Project, the Westside Maintenance Campus, and associated utilities.

The Port has undertaken several initiatives to reduce stormwater runoff and improve the quality of discharges from Airport lands. Such initiatives include enacting low impact development guidelines for new and redevelopment projects in the tributary to the SDS; integrating Airfield Green Stormwater Infrastructure guidance and Infiltration Feasibility Assessment into a programmatic guide for application on-Airport lands; attaining a Salmon-Safe Certification for stormwater infrastructure; implementing measures to manage aircraft deicer runoff; and integrating findings for stormwater infrastructure from the Climate Vulnerability Assessment into its utility planning.

4.3.14.4 Floodplains

Alternative 1: No Action

The No Action Alternative is not anticipated to result in new impacts to floodplains.

Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

The Action Alternatives would not directly impact any floodplains or adversely affect any beneficial floodplain values. Two of the NTPs, Employee Parking Structure (L07) and CRDC (S10), are near floodplains but would not extend into the adjacent 100- or 500-year floodplain areas. The S. 157th Place access road included as part of the Westside Maintenance Project (S07) includes replacing a culvert and paving within a 100- and 500-year floodplain. The culvert would be designed to maintain the conveyance and storage capacity of the existing floodplain. Therefore, the Proposed Action would not result in significant impacts to the floodplain because they would not result in (1) a considerable probability of loss of human life, (2) likely future damage associated with the encroachment that could be substantial in cost or extent, or (3) a notable adverse impact on the floodplain's natural and beneficial floodplain values.

Mitigation and Minimization Measures

Mitigation

Because there would be no impacts to floodplains under any of the alternatives being considered, no mitigation is necessary.

Minimization Measures

Stormwater management facilities would be implemented for planned development, in accordance with regulatory requirements, to avoid indirect water quantity, flow, and quality impacts to floodplains (see Section 4.3.14.3, Surface Waters for further information).

4.3.14.5 Groundwater

Alternative 1: No Action

The No Action Alternative is not anticipated to result in new impacts to groundwater aquifers or WHPA and would not cause any exceedances of groundwater quality standards nor contaminate any aquifers used for public water supply.

Alternative 2: Proposed Action and Alternative 3: Hybrid Terminal Option

Groundwater resources include WHPA. WHPA were established to prevent contamination of the water source by establishing management zones around public wells based on the time it would take for a contaminant to travel through the aquifer to the pumping well. Impact calculations to WHPA are based on ground disturbance within the ten-year contaminant travel zone, where potential contaminants could be released. Based on guidelines established as part of the Wellhead Protection Program,[70] any high-risk operations or facilities (such as pesticide application areas, injection wells, or landfills/disposal areas) located within the wellhead protection area must be identified, and steps taken to reduce contaminant loading.

The Proposed Action would result in permanent impacts to 43.6 acres within the WHPA for Riverton Heights #1 and Riverton Heights #2, along with temporary construction impacts of 2.34 acres. These impacts would be associated primarily with the proposed offsite cargo buildings (C02 and C03), the north GT holding lot (L05), and utility line connections. Note that these two wells are adjacent to each other, and the protection areas almost completely overlap. The impact calculation considers each wellhead protection area separately; thus, the impact is essentially counted twice.

The Taxiway A/B Extension (A01), a stormwater detention pond, and utility line connections would permanently affect 6.25 acres of the wellhead protection area for Tyee Well AFR835. There would be temporary construction impacts to this wellhead protection area totaling 5.21 acres. Operations at this wellhead were voluntarily suspended due to samples exceeding the Washington Department of Health State Action Levels for PFAS.

Additionally, there would be a permanent impact of 2.24 acres to the wellhead protection area associated with the McMicken Heights well east of the Airport. This permanent impact would be due to a utility line connection.

Construction and operation of the Proposed Action would abide by all applicable regulations related to spill prevention and control regulations to prevent spills from causing significant adverse impacts to groundwater. These regulations also specify required cleanup/mitigation actions should a spill occur. To document that construction actions have not impacted groundwater quality within or downgradient of the work area, the Port will monitor groundwater during and following completion of construction. Therefore, no significant impacts to groundwater are anticipated.

Because the Proposed Action would not cause impacts to groundwater that would exceed applicable groundwater quality standards, and because the Proposed Action would not contaminate an aquifer

[70] WAC 246-290-130 (https://app.leg.wa.gov/wac/default.aspx?cite=246-290-130) and WAC 246-290-135 (https://app.leg.wa.gov/wac/default.aspx?cite=246-290-135), accessed March 6, 2024.

used for public water supply, no significant impacts are anticipated. Implementation of stormwater management best practices and facilities (described below under Mitigation and Minimization Measures) would reduce the likelihood that wells or WHPA would be adversely impacted during the construction or operation of the Proposed Action.

Mitigation and Minimization Measures

Mitigation

Given the regulatory framework within which the Port would construct and operate the various elements of the Proposed Action, no significant impacts related to groundwater resources would occur.

Minimization Measures

Potential impacts to groundwater resources would be mitigated through the planned implementation of post-construction stormwater quantity and quality controls, source controls, operational and construction BMPs, and other measures to comply with the Port's NPDES permit, King County's IWD Permit, Construction General Permit, SPCC regulations, and other environmental programs.[71] The Port would also monitor PFAS levels in groundwater downgradient of the work area semiannually for potential impacts to the WHPAs. Specific measures to protect WHPAs will be integrated into project design, as appropriate.

[71] These are discussed in more detail in Appendix F.

5 Cumulative Impacts

The CEQ regulations historically had required the consideration of cumulative impacts. In 2023, Congress passed the Fiscal Responsibility Act which directed agencies to consider "the reasonably foreseeable environmental effects of proposed agency actions" (42 U.S.C. 4332(2)(C)). Since the publication of the Draft EA, the CEQ revoked its regulations (40 CFR parts 1500-1508) implementing NEPA, 42 USC. 4321 *et seq*., as amended, in response to EO 14154, *Unleashing American Energy*. In addition, the Supreme Court issued the Seven County Infrastructure Coalition v. Eagle County, 605 U. S. 975 (2025) (Seven County) ruling on May 29, 2025. As a result of these actions, it is no longer a legal requirement or the policy of the federal government to conduct cumulative impact analyses. In addition, the Seven County ruling reinforced the limited scope of NEPA reviews, holding that NEPA does not require an agency to consider environmental effects of other activities and projects "separate in time or place" from the proposed action. Therefore, this Final EA has removed the prior discussion of, and data/analysis related to, cumulative impacts.

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6 List of Preparers

Table 6-1 provides a list of individuals that were primarily responsible for preparing the EA. The list is organized by the organization for which the individuals work, and includes a brief description of each individual's role in preparing this EA.

TABLE 6-1: LIST OF PREPARERS

Organization	Name and Title	Role
FAA	Kandice Krull, Environmental Protection Specialist	Provided input throughout the process and responsible for the review of the EA.
Port of Seattle	Sarah Cox, Director, Aviation Environment and Sustainability	Provided strategic advice, technical input.
Port of Seattle	Steve Rybolt, Senior Environmental Program Manager	Responsible for project management, technical input, and preparation of the EA.
Port of Seattle	Adele Pozzuto, Senior Environmental Management Specialist	Responsible for technical input and preparation of the EA.
Landrum & Brown	Rob Adams, President / Officer in Charge	Provided strategic advice, technical input, QA/QC, and contract management.
Landrum & Brown	Sarah Potter, Executive Vice President / Project Manager	Responsible for project management, technical input, and preparation of the EA.
Landrum & Brown	Erik Schwenke, Managing Consultant / Deputy Project Manager	Responsible for project management, technical input, and assisted with the preparation of the EA.
Landrum & Brown	Gabriela Elizondo, Senior Consultant	Responsible for preparation of the air quality and GHG analysis.
Landrum & Brown	Charles Babb, Senior Managing Consultant	Assisted with preparing the air quality analysis.
Landrum & Brown	Jesse Baker, Senior Managing Consultant	Responsible for preparing the noise analysis.
Landrum & Brown	Christian Valdes, Senior Managing Consultant	Assisted with preparing the noise analysis.
Landrum & Brown	Eric Seavey, Senior Consultant	Responsible for the preparation of the construction noise analysis.
Landrum & Brown	Kirsten Hammons, Analyst	Assisted with the preparation of the construction noise analysis.
Landrum & Brown	Dominic Poletta	Assisted with the Administrative File.
Landrum & Brown	Michelle Gallo, Associate Vice President	Provided technical input and QA/QC of the EA.
Concord Engineering	Zach Wieben, P.E. PTOE, Senior Engineer	Responsible for surface transportation technical analysis and reports.

TABLE 6-1: LIST OF PREPARERS (CONTINUED)

Organization	Name and Title	Role
Concord Engineering	Monsur Ahmed, P.E. PTOE, Senior Engineer	Provided technical input on surface transportation technical analysis and QA/QC of reports.
Concord Engineering	Siqi Huang, Associate Engineer	Assisted with the preparation of the surface transportation analysis and documentation.
Concord Engineering	Joseph Atwater, E.I.T., Assistant Engineer	Assisted with the preparation of the surface transportation analysis and documentation.
Concord Engineering	Masharul Kabir, E.I.T., Assistant Engineer	Assisted with the preparation of the surface transportation analysis and documentation.
Concord Engineering	Richard Zhong, E.I.T., Assistant Engineer	Assisted with the preparation of the surface transportation analysis and documentation.
Concord Engineering	Matt Bloch, Assistant Engineer	Assisted with the preparation of the surface transportation analysis and documentation.
Confluence Environmental Company	Scott White, Owner, Principal Planner	Subconsultant project management of the ESA and sensitive species reports.
Confluence Environmental Company	Eric Doyle, Managing Senior Aquatic Ecologist	Primary author of the ESA and sensitive species field assessment and Existing Condition review reports.
Confluence Environmental Company	Calvin Douglas, Senior Ecologist	Assisted with the preparation of the ESA and biological reports.
Confluence Environmental Company	Irene Sato, Senior Biologist	Supported development of the ESA and sensitive species field assessment and Existing Condition report, and field reconnaissance.
Gresham Smith	Tim Arendt, P.E., Project Executive	Provided technical input and QA/QC on the surface waters and floodplain elements of the water resources.
Gresham Smith	Tom Dietrich, P.E., Project Manager	Provided subconsultant project management and technical input on the surface waters and floodplain elements of the water resources.
Gresham Smith	Melanie Knecht, P.E., Senior Project Engineer	Responsible for preparing the surface waters and floodplain elements of the water resources sections of the EA.
Maul Foster & Alongi, Inc.	Abbi Russell, Principal Communications Specialist	Provided strategic advice, technical input and QA/QC of the public input.

TABLE 6-1: LIST OF PREPARERS (CONTINUED)

Organization	Name and Title	Role
Maul Foster & Alongi, Inc.	Kathryn Murdock, Community Engagement Project Manager	Responsible for supporting the Port in public engagement, supporting public hearings, and preparing the summary of public input.
Parametrix	Jenifer Young, Division Manager, Environmental Planning & Compliance	Responsible for task management and peer review of EA.
Parametrix	Kaylee Moser, Scientist III	Responsible for preparation of Wetland Delineation Report and Impact Assessment Technical Report.
Parametrix	Kathleen Stephanick, Senior Planner	Responsible for task management and peer review of EA.
Parametrix	Josh Wozniak, Senior Scientist	Responsible for preparation of Wetland Delineation Report and Impact Assessment Technical Report.
Stell Environmental	Tim Gerrish, Cultural Resource Director / Principal Investigator	Responsible for oversight of the cultural resources archaeological investigation for the project and oversight of the Cultural Resources Survey.
Stell Environmental	Sarah Steinkraus, Principal Investigator and Architectural Historian	Responsible for oversight of the cultural resources investigation for the project, the built environment survey, and preparation of the Cultural Resources Survey.
Stell Environmental	James Brown, Archaeologist	Lead the cultural resources field effort for the project and was primary author of the cultural resources report.
Stell Environmental	Michael Johnson, Archaeologist	Conducted fieldwork and worked on the cultural resources report. Produced all maps for the report.
Synergy Consultants, Inc.	Mary Vigilante, Owner	Responsible for technical input, review, and strategy of the EA.

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