ENVIRONMENTAL CHECKLIST

Seattle-Tacoma International Airport (STIA)

Flight Corridor Safety Program 2019

A. BACKGROUND

1. **Name of proposed project, if applicable:**

   Flight Corridor Safety Obstruction Management Program (Program) Tree Obstruction Removal Project (Project) 2019

2. **Name of applicant:**

   Port of Seattle

3. **Address and phone number of applicant and contact person:**

   Port of Seattle
   P.O. Box 68727
   Seattle, WA 98168

   Contact: Steve Rybolt, Senior Environmental Program Manager
   Telephone/Email: (206) 787-5527, Rybolt.S@portseattle.org

4. **Date checklist prepared:** November 26, 2019

5. **Agency requesting checklist:** Port of Seattle – SEPA File Number 19-04

6. **Proposed timing or schedule (including phasing, if applicable):**

   The Project schedule calls for removal of penetrating tree obstructions that affect flight operational pathways in February 2020 followed by removal of near-term tree obstructions as soon as fall 2020, and tree replacement planting in winter 2020-2021.

7. **Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.**

   The Program will continue to identify future obstructions to navigable airspace approximately every five (5) years in order to comply with Federal Aviation Administration (FAA) requirements for air navigation safety. If additional obstructions are identified in the future, they will be removed. Any future obstruction management activities will undergo a separate SEPA review.

8. **List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.**

   - Light Detection and Ranging (LiDAR) Comprehensive Obstruction Analysis (2018)
   - *Seattle-Tacoma International Airport Flight Corridor Safety Obstruction Management Program Regulatory Approach Memorandum* (Appendix B)
   - *Seattle-Tacoma International Airport Flight Corridor Safety Obstruction Management Program Implementation Plan 2019* (Appendix C)
   - Environmental Re-Evaluation for the Puget Sound Gateway Program – Phase 1 of the SR 509 Completion Project (WSDOT SR509 Project Library, January 2018)
   - Final SEPA Mitigated Determination of Non-Significance (MDNS) of Proposed Action for Sea-Tac Airport Flight Corridor Safety Program - Phase 1 (Port of Seattle SEPA No. 16-07, August 2016)

- Addendum to the Final SEPA MDNS of Proposed Action for Sea-Tac Airport Flight Corridor Safety Program - Phase 1 (Port of Seattle SEPA No. 18-02, October 2018)

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

Most tree obstructions are located on public right-of-way under the jurisdiction of the Washington State Department of Transportation (WSDOT). This property is planned for development of the future extension of State Route (SR) 509 along the western and southern edges of Sea-Tac International Airport (STIA). The Port and WSDOT have coordinated on the process for tree removal on WSDOT property for the Project in advance of construction for the SR 509 Extension Project.

10. List any government approvals or permits that will be needed for your proposal, if known.

- Washington State Department of Ecology Construction Stormwater General Permit
- Clearing and grading review under City of SeaTac/STIA Interlocal Agreement (Sec. 5.4(A)(2)(d), referencing City of SeaTac; SMC 13.190)
- Port of Seattle Landscape Design Standards Review/Building Department Permit.

The Port will substantively comply with local land use codes in the cities of SeaTac, Des Moines, and Burien as applicable to tree obstruction removal and replacement (i.e., will not seek permits from local jurisdictions specific to tree obstruction removal and replacement).

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

In 2016 the Port of Seattle (Port), as part of Flight Corridor Safety Program - Phase 1 (Port of Seattle SEPA No. 16-07), identified approximately 2,800 obstructions (i.e. primarily trees) using a Light Detection and Ranging (LiDAR) survey. These obstructions originally identified to be removed ensured compliance with the requirements of Federal Aviation Administration (FAA) for safe operation of aircraft during takeoff and landing at Seattle-Tacoma International Airport (STIA). As part of Flight Corridor Safety Program - Phase 1 (Port of Seattle SEPA No. 16-07), the Port removed 783 trees and replanted 3,684 trees on Port property.

In 2018, the Port conducted a new LiDAR survey and identified obstruction points on Port, public, and =private property. Upon the completion of the survey data and analysis of results, the Port consulted with the Federal Aviation Administration. The outcome of this consultation was to remove obstructions on flight surfaces where it is required to maintain existing flight procedures, and to manage obstructions on flight surfaces where they can be monitored but not required to be removed. With the new guidance, there was a substantial reduction in the number of obstructions. The 2019 field verification of the LiDAR data confirmed that all the obstructions are trees (174 total). These trees are located on airport property and adjacent public and private property. Approximately 60% of tree obstructions are on Washington State Department of Transportation (WSDOT) property. Six obstructions are on Port property, with two of these obstructions within critical areas. Remaining obstructions mostly are under the City of SeaTac, the City of Des Moines (one obstruction) and the City of Burien (seven obstructions).

Table 1. Obstruction Removal Summary

Jurisdiction/ Property Ownership[1]	Number of Obstructions	Notes
Port	**6**	Includes two obstructions in critical areas (one in a wetland and one in the wetland buffer).
WSDOT	**104**	Most obstructions are located on WSDOT right-of-way for the planned SR 509 extension project.
City of SeaTac		
Public	46	This category includes 27 obstructions located on Highline School District Property.
Private	10	Obstructions in this category are located in Hillgrove Cemetery and residential properties.
Subtotal	**56**	
City of Burien		
Public	0	
Private	7	Obstructions are located on a single vacant property zoned residential.
Subtotal	**7**	
City of Des Moines		
Public	1	Obstruction is located on the border of a residential property and City street right-of-way.
Private		
Subtotal	**1**	
Total	**174**	

Source: *Seattle-Tacoma International Airport Flight Corridor Safety Obstruction Management Program Regulatory Approach Memorandum* (Appendix B)

Figure 1. Site Vicinity and Locations of Obstructions

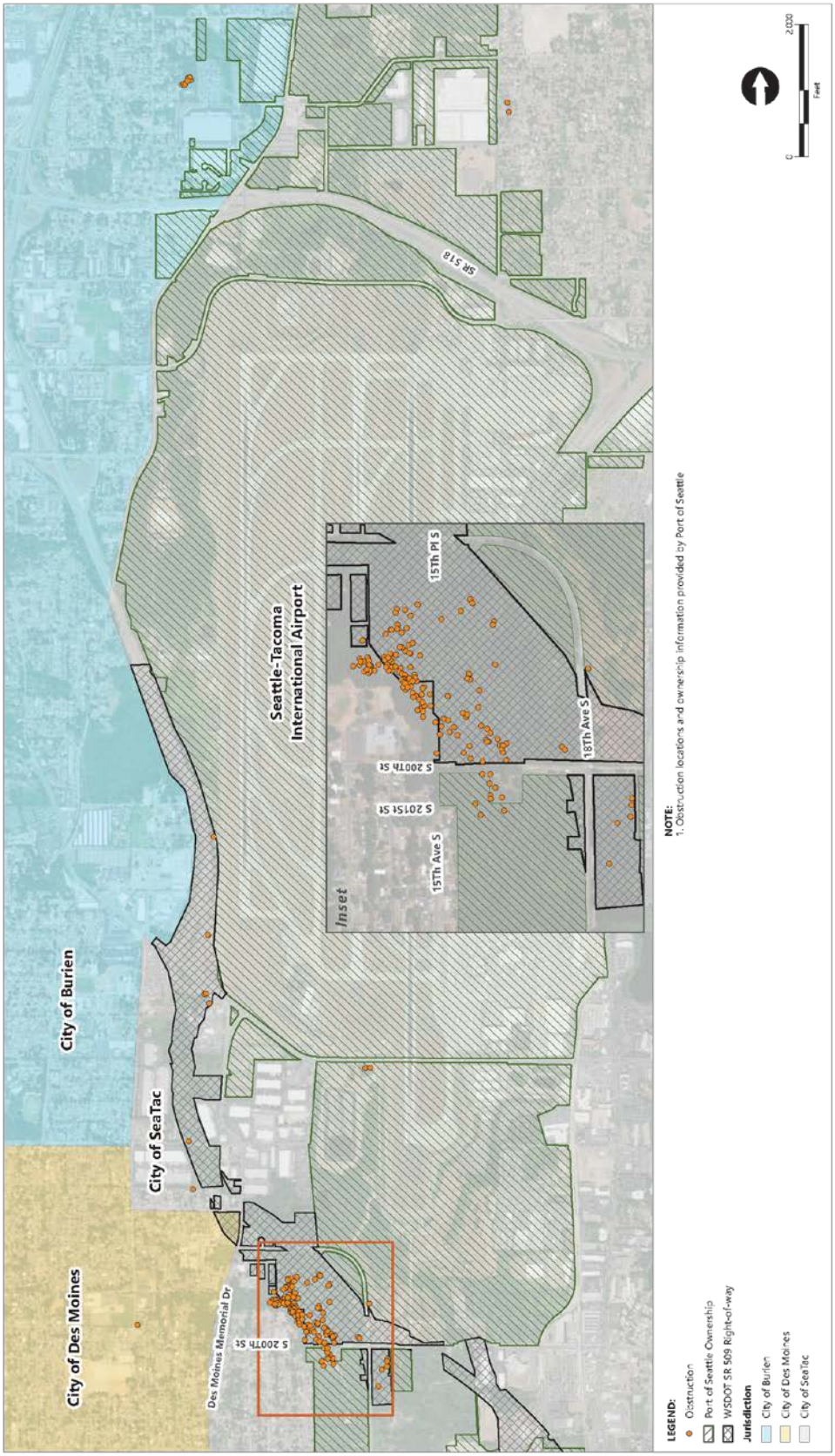


Figure 2. Location of Obstructions and Critical Areas

Tree replacement is planned following removal of obstructions. The Port will replant up to four trees for every tree removed on Port property, and comply with critical areas ordinances for trees in wetlands and buffer areas.[1] On WSDOT property, trees will be removed and replanted based on the Roadside Policy Manual[2], which calls for replacement trees to be planted in WSDOT ROW. Because the obstructions are within the future SR 509 development area, tree replacement associated with WSDOT parcels may occur off site. To the extent possible, the Port will coordinate with WSDOT to install the replacement trees in the vicinity of STIA. Another option for obstructions in WSDOT ROW is to provide tree replacement with in-lieu fee payment or to provide a combination of tree replacement and in-lieu fee payment. Outside of Port and WSDOT property, replanting efforts will also consider up to a four to one replanting ratio determined in coordination with property owners, and in accordance with any applicable jurisdictional requirements.

The anticipated obstruction removal methods for the Project follow a five-step process. This process is designed to meet airport safety needs to remove the obstruction, address environmental requirements, and support the Port's land stewardship goals. The process is described as follows:

1. Site preparation: Site preparation activities prior to obstruction removal include verifying/inspecting site conditions; identifying and installing access barriers, access routes, and staging areas; identifying and installing erosion and sediment control measures; and marking obstructions.
2. Obstruction removal and material disposal: Obstruction removal methods and equipment will vary depending on site characteristics and the distribution and characteristics of obstructions. Tree removal methods include manually removing trees with a chainsaw or using mechanical means. Material disposal methods include leaving material on site with minimal processing or processing into wood chips/mulch; removing the material and transporting off site for contractor disposal; or, where material is considered merchantable, removing the material and transporting it off site for sale.
3. Site treatment: Site treatment following obstruction removal will involve stabilizing soils through seeding, mulch placement and, in certain instances, erosion and stabilization measures. Close out of the work includes removal of temporary facilities and erosion/sediment control measures and cleaning up the site.
4. Replacement: Tree replacement is planned up to a 4:1 ratio for all tree obstructions that are removed within municipalities. Replanted trees can be located in the same area where obstructions are removed, using Port-approved species that will not grow to become obstructions in the future. Replanting efforts will be conducted in coordination with property owners, and in accordance with any applicable jurisdictional requirements. WSDOT will lead tree replacement and revegetation on WSDOT property.
5. Monitoring: The Port will monitor obstruction removal locations on Port Property and within municipalities to ensure that resprouting does not lead to future obstructions and that replacement vegetation is meeting performance standards. Where necessary, the Port will treat stumps to control resprouting and obstruction recurrence and if needed implement contingency measures to ensure success of replacement vegetation.

[1] Exact replanting ratio will be determined based on regulatory requirements, size, type, location of replanting as well as concurrence with relevant stakeholder.
[2] WSDOT, 2015. WSDOT Roadside Policy Manual. M 3110.03. August 2015. Available at: https://www.wsdot.wa.gov/Publications/Manuals/M3110.htm

Additional details on the tree removal and replacement methods for the Project can be found in Appendix C, *Seattle-Tacoma International Airport Flight Corridor Safety Program Implementation Plan 2019*.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

The Project will be located at and around STIA (Figure 1). The physical address of STIA is:

17801 Pacific Highway South
Seattle, WA 98158

Latitude: 47.448417
Longitude: -122.302099

Obstructions are located on airport property and adjacent public and private property (Table 1; Figure 1). These trees occur on parcels under the jurisdiction of the Port, WSDOT, the City of SeaTac, the City of Des Moines, and the City of Burien.

- Port: Six obstructions are on Port property, with two of these obstructions within critical areas. Obstructions are located southwest of the intersection of South 200th Street and 18th Avenue South. Two are located near the east terminus of South 188th Street.

- WSDOT: Approximately 60% of tree obstructions are in WSDOT right-of-way or on other WSDOT property. A majority of the obstructions within the right-of-way are located just northeast of the intersection of South 200th Street and Des Moines Memorial Drive. Many obstructions are located between Des Moines Memorial Drive and 8th Avenue South, north of South 192nd Street up to South 176th Street.

- City of SeaTac: Many obstructions are located around those described in the WSDOT bullet above. Some are located around the intersection of South 200th Street and 18th Avenue South. Two obstructions are located at the east terminus of South 188th Street just west of the STIA Runway 16L/34R. Seven obstructions are located between Des Moines Memorial Drive and 8th Avenue South, north of South 192nd Street up to South 176th Street. Two obstructions are located north of STIA along 24th Avenue South between South 142nd Street and South 146th Street.

- City of Des Moines: The single obstruction is located in Des Moines on 8th Avenue South just north of South 200th Street.

- City of Burien: The seven obstructions are located in Burien just west of 1200 South 144th Street Parking.

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site (circle one): Flat, rolling, hilly, steep slopes, mountainous, other

b. What is the steepest slope on the site (approximate percent slope)?

Most of the sites impacted are flat and rolling. While steep slopes (greater than 40%) occur in the Project area, none of the tree obstructions are located on steep slopes.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

Underlying soil consists primarily of pre-existing glacial till (i.e., Vashon till) and associated outwash sediments or imported sand and gravel that was graded and compacted during original site use.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

There are no surface indications or known historically unstable soil at the sites.[3]

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

There is no anticipated fill, excavation, or grading for the proposed Project.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

The potential exists for some erosion to occur during construction; however, erosion control and prevention measures will be undertaken to minimize that potential.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

There will be no change in impervious surface resulting from this Project.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

During construction, a Temporary Erosion and Sediment Control plan will be in place to prevent erosion at all sites. This is a requirement of the Port of Seattle's Master Specifications.

2. Air

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

Emissions from this Project, including greenhouse gases, will be minimal. Emissions will be generated during removal and replacement construction (construction) resulting from workers traveling to/from the site and construction equipment. Construction activities will also result in short-term, construction-related air emissions such as dust and vehicle exhaust.

See Appendix A, "Greenhouse Gas Emissions Worksheet Supplemental Information for SEPA Environmental Checklist," for additional information.[4]

[3] King County, 2019. King County iMap Interactive Mapping Tool. Accessed: November 25, 2019. Available at: https://www.kingcounty.gov/services/gis/Maps/imap.aspx

[4] City of Seattle, 2007. City of Seattle Department of Planning and Development SEPA GHG Emissions Worksheet Version 1.7. December 26, 2007. Available at: http://www.seattle.gov/sdci/permits/forms

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

There are no off-site sources of emissions that will affect this project.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

The contractor performing construction will be required, per Port of Seattle Master Specifications, to maintain and repair all equipment in a manner that meets state regulations and reasonably minimizes emissions.

3. Water

a. Surface Water:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

Miller Creek, East Fork Des Moines Creek, the mainstem Des Moines Creek, and wetlands are located within the Project area and drain into Puget Sound.[5]

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

The Project will include the removal of one obstruction within a Category II wetland, and one obstruction within the wetland's buffer (Figure 2). The Project proposes selective removal of obstructions within critical areas through felling, limbing, and bucking trees using chain saws (manual work). Remaining stumps will be retained to minimize ground disturbance (stumps will not be grinded or grubbed). Refer to the *Seattle-Tacoma International Airport Flight Corridor Safety Obstruction Management Program Implementation Plan 2019* (Appendix C) for additional information.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

There will be no fill or dredge material that will be placed in or removed from the surface water or wetlands.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

The Project will not require surface water withdrawals or diversions.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

The Project does not lie within a 100-year floodplain.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

The Project does not involve any discharges of waste materials to surface waters.

b. Ground Water:

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well.

[5] Anchor QEA, 2016. Seattle-Tacoma International Airport Flight Corridor Safety Obstruction Management Program Sensitive Areas Special Study. Prepared for: Port of Seattle. 2016.

Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known

Groundwater will not be withdrawn nor will water be discharged to groundwater for this Project.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals . . .; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

Waste materials will not be discharged into the ground from a septic system or other source.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

Stormwater within the Airport Operating Area drains into STIA's stormwater system and through natural infiltration processes. Treatment methods within the Airport's stormwater system include infiltration and detention. Once treated, water is discharged to Puget Sound via Des Moines Creek, Miller Creek, and Walker Creek. All storm drain system and discharges are subject to the STIA's National Pollution Discharge Elimination System (NPDES) permit (#WA-0024651).

Outside of the Airport's stormwater system each site will be evaluated to assess whether stormwater discharge will infiltrate or utilize conveyance mechanisms. It is anticipated that most of the sites stormwater will infiltrate to Puget Sound via the Des Moines Creek, Miller Creek, or Walker Creek sub-basins.

2) Could waste materials enter ground or surface waters? If so, generally describe.

Project design and construction management will prevent discharge of waste materials to surface waters through existing and upgraded stormwater best management practices as required by the local jurisdiction requirements (e.g. King County Stormwater Pollution Prevention Manual), Stormwater Management Manual for Western Washington, STIA's individual NPDES permit, and Spill Prevention, Control, and Countermeasure plan.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.

The Project does not alter or otherwise affect drainage patterns in the vicinity of the sites.

d. Proposed measures to reduce or control surface, ground, runoff water, and drainage pattern impacts, if any:

Tree removal on WSDOT property may involve disturbance greater than 1 acre. As such, water quality will be maintained by treatment under conditions of an approved NPDES Construction Stormwater General Permit and an associated Stormwater Pollution Prevention Plan.

4. Plants

a. Check the types of vegetation found on the site:

__X__ deciduous tree: alder, maple, aspen, other: madrone, poplar, cottonwood, cherry, locust, ash, birch,

__X__ evergreen tree: fir, cedar, pine, other: hemlock

__X__ shrubs

__X__ grass

_____ pasture

_____ crop or grain

_____orchards, vineyards or other permanent crops

__X__ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other

_____ water plants: water lily, eelgrass, milfoil, other

_____ other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

This Project will remove 174 trees, including Douglas fir, bigleaf maple, cottonwood, western hemlock, red alder, and Pacific madrone.

c. List threatened and endangered species known to be on or near the site.

No threatened or endangered plant species are known to be on or near the site.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

After the removal of trees, new trees will be planted. Within Port property and the adjacent municipalities, tree replacement planting will occur at up to a 4:1 ratio using native plant species. Trees removed from WSDOT property will be replanted in accordance with the Roadside Policy Manual. Tree species used for re-planting will be moderately tall conifer or deciduous trees that are not anticipated to become future obstructions. Trees include native cultivar and ornamental species. All re-planted species will meet the City of SeaTac/STIA Interlocal Agreement Review and Applicability, STIA Landscape Design Standards, and other jurisdictional requirements as applicable. A list of approved tree species for revegetation is included in Appendix C.

e. List all noxious weeds and invasive species known to be on or near the site.

Invasive species near obstructions primarily consist of ivy, blackberry, tansy, and poison hemlock.

5. Animals

a. List any birds and animals which have been observed on or near the site or are known to be on or near the site. Examples include:

Birds: hawk, heron, eagle, songbirds, other: starlings, crows, gulls, pigeons

Mammals: deer, bear, elk, beaver, other: rodents

Fish: bass, salmon, trout, herring, shellfish, other:

b. List any threatened and endangered species known to be on or near the site.

No known threatened or endangered animal species are on or near STIA properties in the Project area.

c. Is the site part of a migration route? If so, explain.

Airport property and lands in the immediate airport vicinity are not part of any known migration routes.

d. Proposed measures to preserve or enhance wildlife, if any:

No preservation or enhancement measures are proposed. Re-planted trees on Port property will adhere to STIA Landscape Design Standards to support safe airport operations. Re-planted trees on WSDOT property will be in accordance with the WSDOT Roadside Policy Manual. Re-planted trees on other properties within the adjacent municipalities will be selected by property owners using tree species

approved by the Port and local jurisdiction (as applicable). Removal of tree obstructions and replanting will occur outside of the general avian nesting season to minimize impacts to nesting birds.

e. List any invasive animal species known to be on or near the site.

Rock pigeons, European starlings, American bullfrog, eastern grey squirrels, and eastern cottontails are the only invasive species known to be at the sites.

6. Energy and natural resources

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

There will be no energy requirements for the Project upon completion.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

The Project will not affect the potential use of solar energy by adjacent properties.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:
The Project will not have any energy conservation features.

7. Environmental health

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

There are no known environmental health hazards for this Project.

1) Describe any known or possible contamination at the site from present or past uses.

There are no known contaminated soils that may be encountered during the Project. Plans will be in place to handle contaminated soil if it is encountered during Project construction and all pertinent local, state, and federal regulations will be followed.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity

There are no known hazardous chemicals/conditions that might affect the Project. If contaminated chemicals/conditions are encountered that might affect the Project, plans will be in place to handle hazardous chemicals/conditions when and if they are encountered. During construction, pertinent local, state, and federal regulations will be followed.

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.
Diesel fuel and gasoline will be used on site to power construction equipment including, but not limited to, chainsaws, excavators, dump trucks, and power generators. Heavy equipment will not be allowed within critical areas.

4) Describe special emergency services that might be required.

No special emergency services are expected as a result of implementing the Project. Construction-related accidents or injuries may require response from local fire, police, air units, or ambulances. The Port maintains its own police force and firefighting and rescue units that will be called upon for these types of incidents, on and off Port property. The Port also maintains a trained response team available to respond at all times to any spill or loss of contaminated or hazardous materials.

5) Proposed measures to reduce or control environmental health hazards, if any:

There are no known environmental health hazards that have been identified. If encountered, local, state, and federal regulations regarding safety and handling of hazards materials will be enforced.

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

In general, the dominant source of noise in the airport vicinity is generated by aircraft operations. Local roadway traffic is also a source of noise in the vicinity.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Short-term noise is anticipated from the use of construction equipment during construction activities. Noise impacts are not anticipated to result from the removal of trees.

3) Proposed measures to reduce or control noise impacts, if any:

Short-term noise from construction activities will be mitigated by the use of best management practices and adhering to the City of SeaTac, City of Burien, and City of Des Moines noise ordinances for work within their jurisdictions. No long-term noise mitigation measures are proposed because the project will not change existing noise levels.

8. Land and shoreline use

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.

Obstructions are located on multiple properties with multiple current uses including airport operations, commercial business operations, WSDOT right-of-way, WSDOT surplus, schools, private cemetery, and private residences within residential zoned areas. The proposal will not affect current land uses on nearby or adjacent properties.

Some sites are within a runway protection zone and other Port of Seattle owned property and will continue to support the airport; they will not be affected by the proposal.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?

Project sites are not used as working farmlands or working forest lands.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:

There are no surrounding working farms or forest lands near the Project area.

c. Describe any structures on the site.

There are commercial buildings, residential houses, and airport navigational aids on or adjacent to project sites. It is not anticipated that there will be any impacts to existing structures.

d. Will any structures be demolished? If so, what?

The Project does not anticipate demolishing any structures.

e. What is the current zoning classification of the site?

The zoning classifications will not change as a result of this Project and there is no expected impact to nearby or adjacent land uses and properties. The current land use in project sites are as follows in Table 2:

Table 2. Land Use in Project Sites

Jurisdiction	Zoning Classification
SeaTac	Airfield Operations (AVO) Avian Commercial (AVC) Industrial (I) Park (P) Regional business Mix (RBX) Urban Low Density Residential (UL)
Burien	Professional/Residential
Des Moines	Residential

Sources:
https://cityofseatac.maps.arcgis.com/apps/webappviewer/index.html?id=77d8689c6f0747c9aeacf9f3e56ea72c
https://www.burienwa.gov/city_hall/laws_regulations/zoning
http://www.desmoineswa.gov/DocumentCenter/View/38/Zoning-Map

f. What is the current comprehensive plan designation of the site?

Table 3. Comprehensive Plan Designation

Jurisdiction	Comprehensive Plan Designation
SeaTac	Airport Industrial Park Regional Business Mix Residential Low Density
Burien	Professional/Residential
Des Moines	Single Family

Sources:
https://www.seatacwa.gov/our-city/maps-and-gis/printable-maps

https://burienwa.gov/UserFiles/Servers/Server_11045935/Image/maps/CPLU_Address_010419_36x41.pdf

https://desmoineswa.gov/DocumentCenter/View/2091/2015-Comp-Plan?bidId=

g. If applicable, what is the current shoreline master program designation of the site?

None of the tree obstructions are within a shoreline area.

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.

The Project contains two obstructions within critical areas, both on Port property. One obstruction is within a designated wetland, and one obstruction is within the same wetland's buffer. This wetland is a Category II palustrine forested wetland located at the north end of the STIA Industrial Waste Treatment Plant lagoon. The wetland is split by a gravel road, which is used to access the approach lighting system

towers. Tower maintenance includes routine vegetation clearing in a portion of the wetland; thus, the wetland and buffer remain in a disturbed state (Anchor QEA 2016).

i. Approximately how many people would reside or work in the completed project?

There will be no new jobs created following the completion of the Project.

j. Approximately how many people would the completed project displace?

There will be no displacement impacts expected as a result of this Project.

k. Proposed measures to avoid or reduce displacement impacts, if any:

There will be no persons displaced as a result of this Project.

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

No measures are proposed because there will be no changes to existing or projected land use as a result of this Project.

m. Proposed measures to ensure the proposal is compatible with nearby agricultural and forest lands of long-term commercial significance, if any:

There are no nearby agricultural or forest lands.

9. Housing

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

There will be no housing units provided by this Project.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

There will be no housing units eliminated by this Project.

c. Proposed measures to reduce or control housing impacts, if any:

There will be no housing impacts as a result of this Project. Therefore, measures to reduce or control housing impacts are not proposed.

10. Aesthetics

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

There are no structures proposed as part of the Project.

b. What views in the immediate vicinity would be altered or obstructed?

The Project will remove trees in airport operation, state highway right-of-way, commercial, and residential areas. Some of the trees being removed are within larger stands of trees and provide visual buffers for residential properties. In the areas where trees are being removed, a visual barrier of existing and adjacent trees will continue to exist. A limited number of trees are being removed near residences. The Project is not anticipated to have an adverse impact on the visual quality in the vicinity.

c. Proposed measures to reduce or control aesthetic impacts, if any:

The Project will have a replanting ratio of up to 4:1 for all tree obstructions removed within municipalities. Tree species used for re-planting are not anticipated to become future obstructions. WSDOT will lead tree replacement and revegetation within WSDOT property.

11. Light and glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

This Project does not anticipate producing light or glare.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

Light and glare would not be produced and thus is not expected to be a safety hazard or interfere with views.

c. What existing off-site sources of light or glare may affect your proposal?

There are no existing sources of light or glare that will affect the Project.

d. Proposed measures to reduce or control light and glare impacts, if any:

This Project does not anticipate producing light or glare. If removal of trees occurs in areas that provide a visual barrier for residential areas, the Project will seek, when possible, to maintain vegetated buffer areas in addition to re-planting requirements and minimize any potential impact.

12. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?

Des Moines Creek Trail Park is the only designated recreation area located within the Project Area. No obstructions are proposed to be removed within the park.

b. Would the proposed project displace any existing recreational uses? If so, describe.

The Project will not displace any existing recreational uses.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

No impacts to recreation are anticipated; therefore, no additional measures are proposed.

13. Historic and cultural preservation

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers located on or near the site? If so, specifically describe.

This Project will not affect any buildings, structures, or historic sites.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

There is no change in current use of sites impacted. Review of the Washington State Department of Archaeology and Historic Preservation's database confirmed no known recorded eligible historical or cultural resource properties in the Project area. Six of the obstructions are in a private cemetery adjacent to STIA (i.e. Hillgrove Cemetery) that is not open to the public. The cemetery is older than fifty years but not listed on the National Register of Historic Places or the state register, and it is not currently regulated as a local landmark. The Port will incorporate mitigation measures to avoid impacts to the graves within the cemetery during obstruction removal.[6]

[6] DAHP (Department of Archaeology and Historic Preservation). WISAARD (Washington Information System for Architectural & Archaeological Records Data) Database. Accessed: October 25, 2019. Available at: https://dahp.wa.gov/project-review/wisaard-system

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

There is no change in current use of sites impacted.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

Obstructions are identified in Hillgrove Cemetery and the Port will coordinate with the cemetery to minimize or mitigate any impacts to their site. The Project does not currently anticipate acquiring any permits related to historic or cultural preservation.

14. Transportation

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

The Project will require roadway access to sites for removing obstructions and replanting. The primary access routes will be on major arterials including SR 518, SR 509, Des Moines Memorial Drive, and South 188th Street. Access routes will also be on arterials including South 24th Street, South 200th Street, South 188th Street, 8th Avenue South, and 24th Avenue South, and collector streets including 18th Avenue South, South 192nd Street, South 194th Street, and South 142nd Street.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

The Project is in the vicinity of the Angle Lake Station for the Link Light Rail. King County Metro bus transit also serves the airport and surrounding jurisdictions.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate?

There will be no additional parking spaces created or eliminated by this Project.

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

The proposal will not require any new or improvements to existing roads, streets, pedestrian, bicycle, or state transportation facilities.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

The Project will not require the use of water, rail, or air transportation. However, the project is within the vicinity of STIA and the Sound Transit's Link Light Rail.

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and non-passenger vehicles). What data or transportation models were used to make these estimates?

There will be no additional vehicular trips generated as a result the completed Project.

Construction will result in a temporary increase in traffic volumes due to workers traveling to/from the sites and trucks removing logs and other tree components and transporting replanting materials. Assuming a capacity of approximately ten 20-foot sections of logs per logging truck for removal and additional trucks to transport replanting materials, approximately 100 truck trips are expected for this effort.

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

The Project will not interfere with, affect, or be affected by the movement of agricultural and forest products on roads or streets in the area.

h. Proposed measures to reduce or control transportation impacts, if any:

No impacts to transportation are anticipated; therefore, no additional measures are proposed.

15. Public services

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

The Project will not require an increased need for public services.

b. Proposed measures to reduce or control direct impacts on public services, if any.

There is not expected to be any direct impacts on public services.

16. Utilities

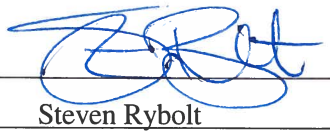
a. Circle utilities currently available at the site: electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other:

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

There are no utilities planned for this Project.

C. SIGNATURE

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: 

Name of signee: Steven Rybolt

Position /Organization Senior Environmental Programs Manager/Port of Seattle

Date Submitted: November 26, 2019

APPENDIX A

Greenhouse Gas Emissions Worksheet
Supplemental Information for SEPA Environmental Checklist

GHG Emission Sources (CO2, CH4, N2O, HFCs, PFCs, SF6)[1]	**What sources are likely from the proposal?** ***List specific type of activities, and duration of emissions***	**What is the quantitative or qualitative assessment of those emissions?**	**What available mitigation will avoid or reduce those emissions?**
On-Road Mobile Sources	Not Applicable	Not Applicable	No mitigation is anticipated for this temporary impact from the Project.
Non-Road Mobile Sources	Not Applicable	Not Applicable	
Stationary Combustion	Not applicable	Not applicable	
Industrial Processes	Not Applicable	Not Applicable	
Fugitive Emissions	Not Applicable	Not Applicable	
Agricultural Emissions	Not Applicable	Not Applicable	
Land Disturbance	Selective tree removal.	Removal of existing trees will cause a temporary release of sequestered carbon, but this carbon is anticipated to be replaced by re-planting at least triple the number of removed trees. Therefore, a lifecycle net reduction in carbon emissions is expected from this project	After the removal of obstructions, trees will be replanted at up to a 4:1 ratio.
Purchased Electricity and Steam	Not Applicable	Not Applicable	
Construction	Selective tree removal and replanting.	Temporary/short-term use associated with construction related emissions is not expected to be significant.	Contractor would be required to maintain and repair all equipment in a manner that reasonably minimizes emissions.
Extraction of Purchased Materials	Not Applicable	Not Applicable	
Processing of Purchased Materials	Not Applicable	Not Applicable	

GHG Emission Sources (CO2, CH4, N2O, HFCs, PFCs, SF6)[1]	**What sources are likely from the proposal?** ***List specific type of activities, and duration of emissions***	**What is the quantitative or qualitative assessment of those emissions?**	**What available mitigation will avoid or reduce those emissions?**
Transportation of Purchased Materials	Not Applicable	Not Applicable	
Employee Commute	Not Applicable	Not Applicable	
Other Mobile Emissions	Not Applicable	Not Applicable	
Water Use and Wastewater Disposal	Not Applicable	Not Applicable	
Waste Management	Not Applicable	Not Applicable	
Product Use	Not Applicable	Not Applicable	

**Calculated via City of Seattle Department of Planning and Development SEPA GHG Emissions Worksheet.*

CH4	Methane	Landfills, production and distribution of natural gas & petroleum, fermentation from the digestive system of livestock, rice cultivation, fossil fuel combustion, etc.
N2O	Nitrous Oxide	Fossil fuel combustion, fertilizers, nylon production, manure, etc.
HFC's	Hydrofluorocarbons	Refrigeration gases, aluminum smelting, semiconductor manufacturing, etc.
PFC's	Perfluorocarbons	Aluminum production, semiconductor industry, etc.
SF6	Sulfur Hexafluoride	Electrical transmissions and distribution systems, circuit breakers, magnesium production, etc.

APPENDIX B

Seattle-Tacoma International Airport
Flight Corridor Safety Program
Regulatory Approach Memorandum

Photograph courtesy of Don Wilson

November 2019
Seattle-Tacoma International Airport Flight Corridor Safety Program

ANCHOR QEA

Regulatory Approach Memorandum

Prepared for Port of Seattle

Port of Seattle

November 2019
Seattle-Tacoma International Airport Flight Corridor Safety Program

Regulatory Approach Memorandum

Prepared for
Port of Seattle
P.O. Box 68727
Seattle, Washington 98168

Prepared by
Anchor QEA, LLC
1201 3rd Avenue, Suite 2600
Seattle, Washington 98101

Project Number: 160003-01.23
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ABBREVIATIONS

BGEPA	Bald and Golden Eagle Protection Act
BMC	Burien Municipal Code
CFR	Code of Federal Regulations
CSWGP	Construction Stormwater General Permit
DMMC	Des Moines Municipal Code
DNR	Department of Natural Resources
FAA	Federal Aviation Administration
FCSP	Flight Corridor Safety Program
FPA	Forest Practices Act
ILA	Interlocal Agreement
LiDAR	Light Detection and Ranging
MBTA	Migratory Bird Treaty Act
Port	Port of Seattle
Program	Flight Corridor Safety Obstruction Management Program
RCW	Revised Code of Washington
SEPA	State Environmental Policy Act
SMC	SeaTac Municipal Code
SR	State Route
STIA	Seattle-Tacoma International Airport
USFWS	U.S. Fish and Wildlife Service
WSDOT	Washington State Department of Transportation

1 Background and Purpose

The Port of Seattle (Port) is implementing a Flight Corridor Safety Obstruction Management Program (Program) to maintain navigable airspace at Seattle-Tacoma International Airport (STIA). The Program ensures compliance with the requirements of the Federal Aviation Administration (FAA) for safe operation of aircraft during takeoff and landing at STIA by removing objects identified as flight safety obstructions.

In 2014, the Port completed a Light Detection and Ranging (LiDAR) survey to identify objects penetrating flight safety surfaces, including their relative elevation. In 2016, the Port completed a State Environmental Policy Act (SEPA) checklist, issued a Mitigated Determination of Non-Significance, and removed obstructions on Port property. A Regulatory Memorandum and Implementation Plan were also developed to support the SEPA review and associated permitting (Anchor QEA 2016a, 2016b).

In 2018, the Port conducted a new LiDAR analysis and identified obstruction points on Port, public, and private property. Based on field verification of the LiDAR data, all the obstructions currently under review are trees (174 total). The Port intends to remove these obstructions as soon as early 2020 and will meet all applicable laws and regulations.

The Port will follow existing precedent for tree replacement on Port property, provide tree replacement outside of Port property consistent with jurisdictional standards to the extent practicable, comply with critical areas ordinances for trees in wetlands and buffer areas, and implement actions according to the environmental review process.

The purpose of this memorandum is to identify anticipated environmental requirements and permits needed to remove the obstructions as well as additional local standards with which the Port has chosen to comply to the extent practicable.

2 Obstruction Summary

2.1 Obstruction Location

This section identifies the location of the tree obstructions by jurisdiction and property ownership. Local jurisdictions are generally the primary source of standards for tree removal and replacement. Each jurisdiction has unique requirements for tree removal and replacement that inform the regulatory approach within this memorandum.

Table 1 summarizes the quantity of obstructions to be removed by jurisdiction. Attachment 1 provides a detailed list of obstructions and their attributes.

Table 1
Obstruction Removal Summary

Jurisdiction/ Property Ownership[1]	Number of Obstructions	Notes
Port	**6**	Includes two obstructions in critical areas (one in a wetland and one in the wetland buffer).
WSDOT	**104**	Most obstructions are located on WSDOT right-of-way for the planned SR 509 extension project.
City of SeaTac		
Public	46	This category includes 27 obstructions located on Highline School District Property.
Private	10	Obstructions in this category are located on Hillgrove Cemetery and residential properties.
Subtotal	**56**	
City of Burien		
Public	0	
Private	7	Obstructions are located on a single vacant property zoned residential.
Subtotal	**7**	
City of Des Moines		
Public	1	Obstruction is located on the border of a residential property and City street right-of-way.
Private		
Subtotal	**1**	
Total	**174**	

Source: Refer to Attachment 1 for obstruction attributes including jurisdiction and owner type.

Figure 1 demonstrates that approximately 60% of obstructions are in the State Route (SR) 509 right-of-way and adjacent surplus property owned by Washington State Department of Transportation (WSDOT), which administers its own clearing standards. Remaining obstructions fall

under City of SeaTac and Port jurisdiction with a limited number of trees located within Des Moines (one obstruction) and Burien (seven obstructions) city limits.

Two obstructions occur on Port property within critical areas (e.g., streams, wetlands, and steep slopes). Figure 2 identifies the location of critical areas, indicating that one obstruction is within a wetland and a second obstruction is within the wetland buffer located on Port property.

2.2 Obstruction Removal Process

The Port will lead or facilitate the removal of obstructions. The anticipated obstruction removal methods for the Program follow a five-step process. This process is designed to meet airport safety needs to remove the obstruction, address environmental requirements, and support the Port's land stewardship goals. The process is described as follows:

1. **Site preparation**: Site preparation activities prior to obstruction removal include verifying/inspecting site conditions; identifying and installing access barriers, access routes, and staging areas; identifying and installing erosion and sediment control measures; and marking obstructions and other features to be removed.
2. **Obstruction removal and material disposal**: Obstruction removal methods and equipment vary depending on site characteristics and the distribution and characteristics of obstructions. Tree removal methods include manually removing trees with a chainsaw or using mechanical means. Material disposal methods include leaving material on site with minimal processing or processing into wood chips/mulch; removing the material and transporting off site for contractor disposal; or, where material is considered merchantable, removing the material and transporting it off site for sale.
3. **Site treatment**: Site treatment following obstruction removal involves stabilizing soils through seeding, mulch placement and, in certain instances, erosion and stabilization measures. Close-out of the work includes removal of temporary facilities and erosion/sediment control measures, and cleaning up the site.
4. **Replacement**: Revegetation and tree replacement are key components of regulatory compliance. Tree replacement ratios identified by jurisdiction are discussed in Section 4.
5. **Monitoring**: The Port will monitor obstruction removal locations to ensure that resprouting does not lead to future obstructions and that replacement vegetation is meeting performance standards. Where necessary, the Port will treat stumps to control resprouting and obstruction recurrence and, if needed, implement contingency measures to ensure success of replacement vegetation.

Figure 1 **Site Vicinity and Location of Obstructions**

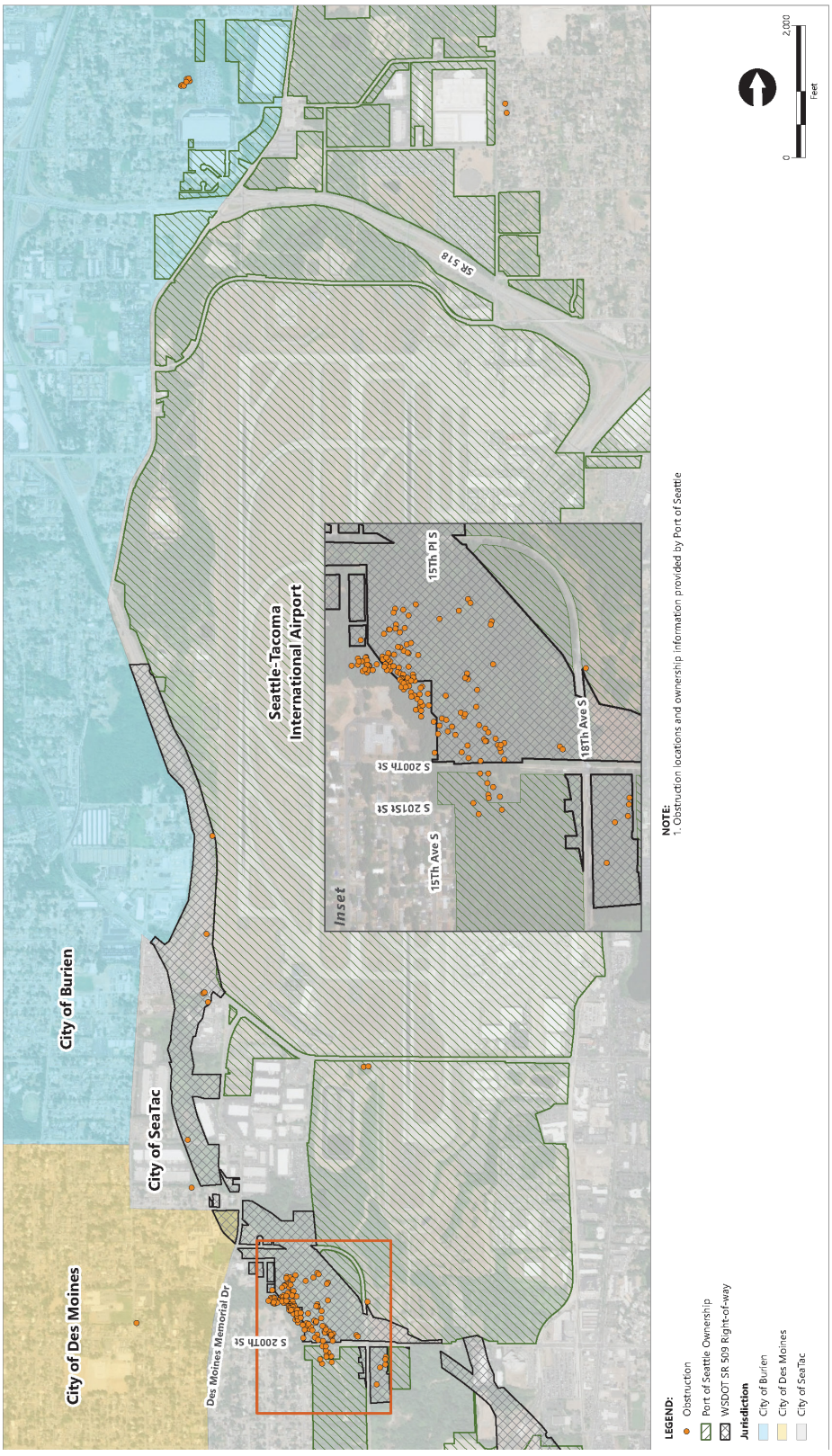
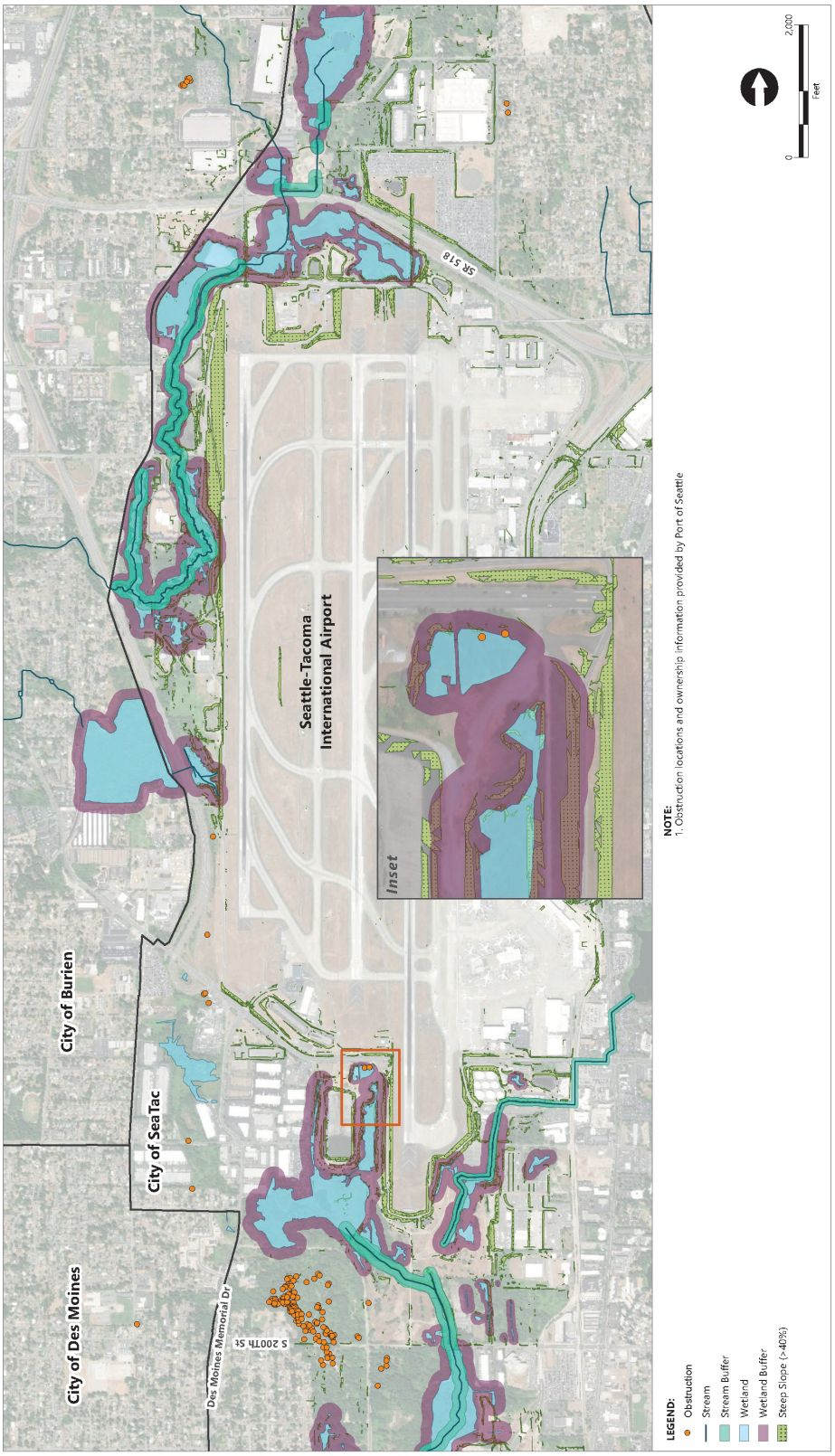


Figure 2 Location of Obstructions and Critical Areas



3 Regulatory Approach and Approvals

This section provides a discussion of applicable regulatory reviews and approvals required prior to removing tree obstructions.

3.1 Regulatory Approach

3.1.1 Program Purpose and Compliance Overview

The purpose of this Program is to maintain the flight paths from STIA by eliminating obstructions to safe and efficient takeoff and landing.

Conditions of the FAA-issued Airport Operating Certificate require the Port to ensure there are no obstacles or obstructions on or around STIA that could affect flight safety. Hazardous obstructions to air navigation are defined by the FAA as features that "affect the safe and efficient use of navigable airspace and the operation of planned or existing air navigation and communication facilities" (14 Code of Federal Regulations [CFR] Part 77).

In addition, state law expressly identifies obstructions that "in effect reduce the size of the area available for the landing, taking-off, and maneuvering of aircraft thus tending to destroy or impair the utility of the airport and the public investment therein" as "airport hazards." This provision also declares that the creation or establishment of airport hazards is a "public nuisance" (Revised Code of Washington [RCW] 14.12.020). RCW 14.08.030(4) further provides that it is unlawful for anyone to "permit to grow higher any tree or trees or other vegetation, which shall encroach upon any airport protection privileges."

While public safety is the driver for the Program, the approach will also address the following objectives:

1. **Comply with FAA Operating Rules and Guidelines:** The Port will demonstrate to the FAA that obstruction standards, vegetation management, grant assurances, and wildlife hazard management requirements are being met.
2. **Comply with Applicable Federal, State, and Local Requirements:** Through the Program, the Port will avoid and minimize impacts to critical areas and will comply with applicable requirements under federal and state law and land use standards in local codes (to the extent practicable). Where impacts to critical areas are unavoidable, the Port will ensure consistency with development standards for tree and vegetation removal and revegetation.
3. **Provide Revegetation Benefits:** The Port recognizes that replacing obstructions with native or ornamental vegetation provides a number of benefits, including soil protection, water quality improvements, aesthetic qualities, and noxious weed control.

4. **Maintain Consistency with Airport Policies:** The Port will follow airport policies in the planning and implementation of the Program. Certain airport rules and regulations in the Port of Seattle *Schedule of Rules and Regulations No. 5* relate (or may relate) to obstruction removal, including Environmental (Section 4) and Landscaping and Water Management (Section 5G), which define best management practices for work in critical areas, planting requirements, emergency removal of aviation hazards, and work within restricted areas, including mitigation sites (Port of Seattle 2015). The STIA Century Agenda strategic objectives that may relate to the implementation details of this program include using the Port's influence to promote small business growth and workforce development, and being the greenest, most energy-efficient port in North America (Port of Seattle 2018). The Environmental Strategy Plan for STIA includes a number of goals, under the Managing Natural Resources priority, that may relate to obstruction removal; these include increasing the solid waste recycling rate (Goal 10), reducing land clearing and construction debris generated by the airport and its contractors (Goal 11), achieving and maintaining best management practices for water quality treatment and flow control (Goal 14), improving habitat and protection for native species not in conflict with aviation safety, and managing hazardous wildlife with biologically sound approaches (Goal 15; Port of Seattle 2009).
5. **Minimize Costs for Removal and Long-Term Monitoring**: The Port will seek to minimize costs for obstruction removal and ongoing maintenance to the extent practical and consistent with the other objectives. This will guide the removal techniques, revegetation, sequencing of construction, and identification of opportunities for material reuse. This effort may also include the proactive removal of vegetation that is nearing obstruction status and is in the vicinity of current obstructions.

3.2 Compliance with Laws, Agency Mandates, and Guidance

3.2.1 Federal

As a condition of the FAA-issued Airport Operating Certificate, the Port is required to ensure there are no obstacles or obstructions on or around STIA that could affect aviation safety. The FAA defines hazardous obstructions to air navigation as features that "affect the safe and efficient use of navigable airspace and the operation of planned or existing air navigation and communication facilities" (14 CFR Part 77). The Port will demonstrate to FAA that obstruction standards, vegetation management, grant assurances, and wildlife hazard management requirements are being met.

Section 404 of the U.S. Clean Water Act requires avoidance and minimization of potential impacts to waters of the United States, including wetlands. Although no Section 404 impacts (fill within waters of the United States) will occur for removing the obstruction within a wetland on Port property, the Program acknowledges this requirement and is designed to minimize impacts to the wetland and buffer by using a selective obstruction removal method and replacing the trees.

Two federal regulations administered by the U.S. Fish and Wildlife Service (USFWS) address protection of bird species. The Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703-712) makes it unlawful to take, import, export, possess, sell, purchase, or barter any migratory bird, with the exception of the taking of game birds during established hunting seasons. A recent policy update from USFWS clarified that a permit is not required to destroy migratory bird inactive nests (i.e., nests without viable eggs or chicks), provided the nest is destroyed and not retained (USFWS 2018). The Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668-668c) is similar to the MBTA and makes it unlawful to take, import, export, sell, purchase, or barter any bald or golden eagle, their parts, products, nests, or eggs. "Take" includes pursuing, shooting, poisoning, wounding, killing, capturing, trapping, collecting, molesting, or disturbing eagles. USFWS developed National Bald Eagle Management Guidelines that provide information on when and under what circumstances eagles may be disturbed by certain types of activity, and are intended to help people avoid and minimize impacts to bald eagles, particularly where actions or activities may result in "disturbance" of a nest, which is prohibited by the BGEPA (USFWS 2007).

3.2.1.1 Municipal Airports Act RCW 14.08.030

The Washington State Municipal Airports Act authorizes municipalities to acquire property for air navigation facility purposes, including, where necessary, acquiring property to provide unobstructed air space for landing and take-off areas (Revised Code of Washington [RCW] 14.08.030). "Municipality" is defined as "any county, city, town, airport district, or port district of the state" (RCW 14.08.010). The Municipal Airports Act prohibits vegetation growing in a manner that encroaches upon airport protection privileges, and the municipality may remove these encroachments without being liable for damages.

3.2.1.2 Airport Zoning Act RCW 14.12.020

Within Washington State, the Airport Zoning Act defines an "[a]irport hazard" as "any structure or tree or use of land which obstructs the airspace required for the flight of aircraft in landing or taking-off at an airport or is otherwise hazardous to such landing or taking-off of aircraft" (Chapter 14.12 RCW). Airport hazards endanger the lives and property of airport users and the occupants of property in the vicinity of the airport (RCW 14.12.020). The Airport Zoning Act further identifies airport hazards as "public nuisances"—the creation of which should be avoided (RCW 14.12.020). Implementing the Program is consistent with the Airport Zoning Act.

3.2.1.3 Noxious Weed Law

The state noxious weed law (Chapter 17.10 RCW) serves to prevent the spread of noxious weeds, which are non-native plants that, once established, are highly destructive, competitive, and difficult to control. Some noxious weeds are toxic or a public health threat to humans and animals, while others destroy native and beneficial plant communities (King County 2019). Property owners have the duty to control their spread (RCW 17.10.140), which is particularly important at sites where

multiple trees will be removed as part of the Program. The Port's revegetation efforts are designed to prevent the establishment and spread of noxious weeds.

3.3 State and Local Permits or Approvals

3.3.1 State Environmental Policy Act

A review in accordance with the SEPA is required to implement the Program. The Port will be the SEPA lead agency responsible for completing an evaluation of potential environmental impacts associated with the obstruction management activities.

An Implementation Plan will provide a description of work in sufficient detail to address applicable provisions of municipal code requirements related to critical areas and tree replacement from the cities of SeaTac, Burien, and Des Moines, as well as the WSDOT's Roadside Policy Manual (WSDOT 2015). The SEPA documentation will be completed by preparing an environmental checklist. Following public review of the findings, the Port plans to issue a final SEPA decision.

3.3.2 State Permits and Approvals

3.3.2.1 Forest Practices Act

The state Forest Practices Act (FPA) (Chapter 76.09 RCW) calls for a Class IV Forest Practices Permit for timber harvesting on forestland located within urban growth boundaries as defined by the Growth Management Act, Chapter 36.70A RCW, due to the risk that the land will be converted from forestland to urban development.[1] Local jurisdiction regulations for clearing and grading activities are established to be consistent with and comply with environmental protection measures of Class IV Forest Practices requirements, such as erosion control and protection of critical areas.

For the obstructions removed from Port property in 2017, the Department of Natural Resources (DNR) advised that removal of obstructions on Port property did not require a Forest Practices permit because the Port's property does not qualify as "forestland." All of the Port's property is zoned either Aviation Operation or Aviation Commercial and none of it is used to grow merchantable stands of timber.

Obstructions under review in this Regulatory Memorandum involve non-Port landowners and properties. As with the Port's property, all of the properties with obstructions are located within the Urban Growth Area and many are developed for other purposes (e.g., schools, right-of-way, and residential homes).

[1] Timber harvesting on forestlands within urban growth areas is ordinarily treated as a Class IV forest practice requiring a permit, unless the forest landowner makes written commitments not to convert the land to a use other than commercial forest product operations for 10 years or submits a conversion option harvest plan approved by a local government entity (WAC 222-16-050(2)(c)).

No DNR approval is required for Class I forest practices which have "no direct potential for damaging a public resource" and Class II forest practices which have "a less than ordinary potential for damaging a public resource" (although DNR notification is required five days prior to commencing a Class II forest practice). RCW 76.09.050. Both Class III and Class IV forest practices require DNR to approve an application: Class IV forest practices include activities with specific types of impacts, and Class III forest practices are defined as "forest practices other than those contained in Class I, II, or IV." RCW 76.09.050; Washington Administrative Code (WAC) 222-16-050.

As part of the Implementation Plan, properties will be evaluated for the following attributes:

- Whether the property is "forestland"[2] and therefore triggers FPA jurisdiction.
- Whether removal of the obstructions would otherwise impact any of the special resources that DNR would treat as a Class IV forest practice: designated (state) critical habitat, parks (if harvest exceeds 5,000 board feet), potentially unstable slopes or areas designated as high avalanche hazards where there is the potential to deliver sediment or debris to a public resource, archeological and historic sites, or filling/draining more than 0.5 acre of wetlands (WAC 222-16-050).
- If the property is "forestland" but does not trigger treatment as a Class IV activity, an assessment of whether the tree harvesting on a particular property would qualify as a Class I or Class II forest practice:
  - Port-owned property – Removal of less than 5,000 board feet of timber would be a Class I forest practice, as per WAC 222-16-050(3)(k).
  - Cemetery – Forest practices approved by Cemetery Board are a Class I forest practice, as per WAC 222-16-050(3)(r)(ii).[3]
  - Other public and private property:
    - **If a single landowner's contiguous property holdings are less than two acres in size**, the harvest could be a Class I forest practice, as per WAC 222-16-050(3)(r)(iii).[4]

[2] "'Forestland' means all land which is capable of supporting a merchantable stand of timber and is not being actively used for a use which is incompatible with timber growing." RCW 76.09.020(15); WAC 222-16-010. "Timber" means forest trees, standing or down, of a commercial species, including Christmas trees. WAC 222-16-010.

[3] Class I does not apply if any of the operation takes place within the shoreline area of a Type S Water or the riparian management zone of a Type F Water, the bankfull width of a Type Np Water or flowing Type Ns Water and the operation does not involve off-road use of tractor or wheeled skidding systems on a sideslope of greater than forty percent.

[4] Class I does not apply if any of the operation takes place within the shoreline area of a Type S Water or the riparian management zone of a Type F Water, the bankfull width of a Type Np Water or flowing Type Ns Water and the operation does not involve off-road use of tractor or wheeled skidding systems on a sideslope of greater than forty percent.

- **If less than forty percent of the live timber volume is being cut <u>or</u> the harvest is on less than forty acres**, then the harvest could be a Class II forest practice, as per WAC 222-16-050(3)(e)(i), (iv).[5]

3.3.2.2 National Pollutant Discharge Elimination System Construction Stormwater General Permit

In accordance with Chapter 90.48 RCW and the U.S. Clean Water Act, a Construction Stormwater General Permit (CSWGP) for National Pollutant Discharge Elimination System compliance is anticipated for sites (e.g., WSDOT right-of-way area) where clearing and grading will exceed 1 acre.

3.3.3 Local Permits and Approvals

Although City codes may identify some of the obstructions as "significant trees" that should be retained, federal and state laws identify the obstructions as a "public nuisance" that the Port is legally required to remove to maintain a safe and efficient flight path. The Port will comply with land use provisions of City codes to the extent practicable for tree obstruction removal and replacement.

Port-owned property within the City of SeaTac is governed by an Interlocal Agreement (ILA) with the City regarding land use. The ILA provides that Port-owned properties within the "Airport Activity Area" are exempt from the development standards and regulations in the SeaTac Municipal Code (SMC) and are instead governed by the development standards in the ILA (ILA, Sec. 3.4(B)). The obstructions addressed in this memorandum are located within the "Airport Activity Area."

3.4 Regulatory Summaries by Agencies with Jurisdiction

3.4.1 Port of Seattle

3.4.1.1 Obstruction Summary

There are six obstructions on Port property. All of the obstructions are located within the Aviation Operations or Aviation Commercial zoning designations. One obstruction is in a Category II wetland[6], and an additional obstruction is within the same wetland's buffer.

[5] Class II does not apply if any of the operation takes place within the riparian management zone of a Type F Water, the bankfull width of a Type Np Water, within a wetland management zone, within a wetland, and the operation does not involve off-road use of tractor or wheeled skidding systems on a sideslope of greater than forty percent and none of the operations are located on lands with a likelihood of future conversion.

[6] Category II wetlands are difficult, though not impossible, to replace, and provide high levels of some functions (SMC Section 15.700).

3.4.1.2 Regulatory Summary

Obstructions on Port property are within the City of SeaTac in areas zoned either Aviation Operations or Aviation Commercial. No external approval is required for the Port to remove obstructions on its own property.

For critical areas, the ILA provides that the City's critical areas regulations in SMC Chapter 15.700 will apply to Port property (ILA, Sec. 6.2(A)). For Port-owned property within the "Airport Activity Area" the Port administers the critical area review, including preparation of critical area reports (ILA, Sec. 6.2(B)). The ILA provides that the critical areas regulations will be "flexibly administered on a case-by-case basis" to harmonize state and federal regulations (ILA, Sec. 6.2(D)). All of the obstructions on Port-owned property are located within the "Airport Activity Area."

The ILA also addresses clearing and grading as part of the division of labor for building permits. The Port (through the Airport Building Department) is responsible for administering and enforcing the requirements of SMC 13.190 for properties within the "Airport Activity Area" (ILA, Sec. 5.2(A) and 5.4(A)(2)(d)). This includes permit issuance (ILA, Sec. 5.4(D)(1)). SMC 13.190.050 and 13.190.055 also identify permit exceptions, which are applicable to tree obstruction removal on Port property.

Table 2 provides a summary of the anticipated regulatory compliance required for tree removal on Port properties.

Table 2
Summary of Regulatory Compliance for Port Property

Element	Relevant Code or Authority	Notes
SEPA	Chapter 43.21c RCW; Port lead agency as per ILA Sec. 6.1(A)(1).	The Port will complete SEPA review.
Critical Areas	ILA, Sec. 6.2(A), referencing City of SeaTac Environmentally Critical Areas Code: • SMC 15.700.290 and 15.700.310 Wetlands	The Port will conduct critical areas review and ensure compliance with these provisions to the extent practicable for work within Wetland IWS-a, a Category II wetland.
Clearing and Grading Review	ILA, Sec. 5.4(A)(2)(d)). referencing City of SeaTac; SMC 13.190	The Port will conduct a clearing and grading review through the Airport Building Department. As per the ILA, the Port is not required to seek any permits from the City of SeaTac for work within the Airport Activity Area.

3.4.2 Washington State Department of Transportation Property

3.4.2.1 Obstruction Summary

There are 104 obstructions on WSDOT-owned property, the majority of which are located within the right-of-way for the future SR 509 extension. There are no obstructions that fall within critical areas or critical area buffers on WSDOT property.

3.4.2.2 Regulatory Summary

All obstructions on WSDOT property are located within the boundaries of the City of SeaTac. The WSDOT-owned property is not currently occupied by an active roadway or highway, but is anticipated to be primarily occupied by the future extension of SR 509. The WSDOT Roadside Policy Manual (2015) governs roadsides under WSDOT jurisdiction and is applicable to this future extension.

The Roadside Policy Manual provides that "[w]here a project or entity disturbs the roadside, the project or entity is responsible for restoring the disturbed area to the ecosystem appropriate to that location and the applicable roadside zone" (WSDOT 2015, page 2-1). For non-WSDOT actions (e.g., public transit agencies, developer projects, and utility owners) where disturbance extends beyond Zone 1 (i.e., the vegetation-free or routinely mowed zone adjacent to the pavement), the Roadside Policy Manual requires the non-WSDOT entity to "[r]estore soil and vegetation in disturbed areas, or an equivalent area, with the goal of restoring functions." Restoration may be provided outside disturbed areas if functions cannot be provided within the disturbed area (WSDOT 2015, page 2-2).

WSDOT has specific guidelines for tree removal on their property within the Roadside Policy Manual. The Roadside Policy Manual specifies replacement ratios based on the size of trees removed. The replacement ratio for moderate-size coniferous and other late successional species trees (between 4 and 30 inches in diameter) is one 1-gallon replacement tree for each 1 inch of trunk diameter (WSDOT 2015). Replacement requirements for trees greater than 30 inches is determined by WSDOT Headquarters Design Landscape Architect for project-specific restoration actions. Tree replacement associated with tree removal will occur on WSDOT property outside of the future SR 509 corridor.

Table 3 provides a summary of relevant regulatory compliance for WSDOT-owned property.

Table 3
Summary of Regulatory Compliance for Washington State Department of Transportation Property

Element	Relevant Code or Authority	Notes
SEPA	Chapter 43.21c RCW; Port lead agency	Port SEPA decision will be used for removal of trees on WSDOT property.
Forest Practices Act	RCW 76.09.050; WAC 222-16-050	Coordination with WSDOT and DNR will be required to confirm application of FPA to the obstruction removal.
WSDOT Roadside Policy Manual	Section 2.2 Implementing Policies	The Port would coordinate with WSDOT to implement the applicable provisions for tree removal and replacement.
Construction General Stormwater Permit – National Pollutant Discharge Elimination System	Chapter 90.48 RCW; WAC 173-201A and WAC 173-220	Required for clearing, grading, and excavating activities that disturb one or more acres and discharge stormwater to surface waters of the state.

3.4.3 Local Jurisdictions

Regulatory compliance for obstruction removal outside of the Port- and WSDOT-owned properties within the cities of SeaTac, Burien, and Des Moines is summarized in this section. The relevant municipal codes are identified, along with notes regarding their applicability to removal of the current group of obstructions. As stated earlier, the Port will comply with land use provisions of City code to the extent practicable for tree obstruction removal and replacement. It is not likely that CSWGP would be required on these properties because the threshold to trigger these approvals would not be met. The Port will coordinate with individual property owners and prepare documentation addressing applicable code requirements. Specific informational folios are found in Attachment 2 to this memorandum.

3.4.3.1 Properties Within the City of SeaTac

3.4.3.1.1 Obstruction Summary

There are 56 obstructions located on public and private properties within the City of SeaTac (other than WSDOT and Port properties). There are no obstructions within the City of SeaTac (except those on Port property, as discussed earlier) that fall within critical areas or critical area buffers.

3.4.3.1.2 Regulatory Summary

Table 4 provides a summary of the relevant regulatory compliance associated with tree removal on properties within the City of SeaTac (outside of WSDOT and Port properties).

The SMC recognizes the need for height restrictions, but the SMC does not expressly extend these restrictions to tree obstructions. Within SMC 15.400.340 A., Height Limits Near Major Airports, the City establishes that "no building or structure shall be erected to a height in excess of the height limit

established by the Airport Height Map for Seattle-Tacoma International Airport." While tree obstructions are not structures, the height limit restriction for STIA is recognized in the city code. Note also that, in the ILA, the City recognized the limitations of federal airspace regulations with respect to development within the City and agreed to make property owners aware of FAA requirements (ILA, Sec. 3.6(A)).

Table 4
Summary of Regulatory Compliance Within the City of SeaTac

Element	Relevant Code or Authority	Notes
Clearing and Grading	SMC 13.190 – Clearing and Grading Code SMC 13.190.050 – Clearing and grading permit required – Exceptions A. The project includes less than seven thousand (7,000) square feet of land disturbing activity; and B. The performance and restoration requirements of this chapter are met and best management practices are utilized to protect water quality; and C. The activity does not occur in a sensitive area or its buffer regulated under SMC Title 15	Some tree obstruction removals would fall within the clearing and grading exceptions. For work that exceeds 7,000 square feet of disturbance, the Port will comply with land use provisions of the City code to the extent practicable.
City Right-of-Way Use Permit	SMC 11.10.080 B. Class C – Disturbance of City Right-of-Way. Class C permit issued for work in the City right-of-way include but are not limited to: i. Maintaining or removing street trees;	Some obstructions are located on city right-of-way and the Port would comply with land use provisions of the City code to the extent practicable.

Note:
Excludes Port and WSDOT properties within City of SeaTac city limits

3.4.3.2 Properties Within the City of Burien

3.4.3.2.1 Obstruction Summary

The City of Burien has seven obstructions located on a single residential property within the "Professional/Residential" zoning designation; none of the obstructions are within critical areas or critical area buffers.

3.4.3.2.2 Regulatory Summary

Table 5 provides a summary of the relevant regulatory compliance associated with tree removal on properties within the City of Burien.

Table 5
Summary of Related Regulatory Compliance Within City of Burien

Element	Relevant Code or Authority	Notes
Airport Hazards	BMC 19.17.140 Height – Limits near Major Airports "No building or structure shall be erected nor shall any tree be allowed to grow to a height in excess of the height limit established by the airport heights maps for the Seattle-Tacoma International Airport"	This provision supports the authority and necessity of obstruction removal.
Clearing and Grading	BMC 15.05.245 Work exempt from permit. 6) Grading. (a) Grading that disturbs less than 7,000 square feet of land in an isolated, self-contained area; provided, that there is no danger to the public and such grading will not adversely affect adjoining properties, as determined by the building official	Tree obstruction removal on the property in Burien would not involve grading above the permit threshold.
Significant Tree Removal	BMC 19.25.120, also referenced in the City of Burien Significant Tree Removal/Pruning Handout related to **Tree Retention in Non-Critical Areas:** *"For developed, private lots tree removal and pruning are allowed without a permit."*	
Prohibited Trees	BMC 19.10.408 Prohibited tree Black locust (*Robinia pseudoacacia*), Cottonwood (*Populus trichocarpa*), Native alder (*Alnus glutinosa*), Native willow (*Salix*), Lombardy poplar (*Populus nigra 'Italica'*), and European ash (*Fraxinus excelsior*) are prohibited in new land development landscaping or as a required replacement tree on private and public property.	These species will be avoided for any tree replanting within the City of Burien.

3.4.3.3 Properties Within the City of Des Moines

3.4.3.3.1 Obstruction Summary

The City of Des Moines has one obstruction located at the street edge of a residential property, within the Residential (RS-7,200) zoning designation. This obstruction does not fall within a critical area or critical area buffer.

3.4.3.3.2 Regulatory Summary

The City Code provides that no tree permit is required for removal unless the tree is located within a critical area or shoreline area, or associated buffers, within a required landscaping area, City-owned property, City right-of-way, or where the total area to be cleared is 2,000 square feet or greater (Des Moines Municipal Code [DMMC] 16.25.050(1), (2)).

Table 6 provides a summary of the relevant regulatory compliance associated with tree removal on properties within the City of Des Moines.

Table 6
Summary of Regulatory Compliance for the City of Des Moines

Element	Relevant Code or Authority	Notes
Clearing and Grading	DMMC Chapter 14.20.180 Exemptions (1) A grading or land clearing permit shall not be required for any of the following activities; provided, that the land clearing activity shall not exceed 2,000 square feet; the grading and filling activity shall not exceed 50 cubic yards; and that the clearing, grading, and filling activity shall be subject to the minimum requirements specified in this chapter	Exemption to clearing and grading is anticipated as cleared areas will likely be less than 2,000 square feet and the grading and filling less than 50 cubic yards.
Tree Removal	DMMC 16.25.050 Permit – Requirements. (1) No Tree Permit Required. Except as otherwise provided in subsection (2) of this section, no tree permit is required to remove, cut, or prune trees on private developed, partially developed, or undeveloped lots as follows: (a) Trees located outside of environmentally critical areas, shoreline areas, and associated buffer areas as verified by the City or qualified professional; (b) Trees that are not part of a required landscaping area; (c) The total area to be cleared is less than 2,000 square feet; and (d) An exemption from a tree permit does not exempt a property owner from complying with policies, criteria and standards contained in this chapter or other applicable local, state or federal regulations or permit requirements.	Per the code no tree permit is required for this property. The tree is on private property, the total area to be cleared would be less than 2,000 square feet, and the tree is not located within an environmentally critical area, shoreline area, or associated buffer.
	16.25.050 (d) Removing, cutting, or pruning of trees located within the City right-of-way shall be reviewed in accordance with the use and maintenance of public rights-of-way provisions codified in chapter 12.05 DMMC.	This code is also applicable as the tree is partially located on City street right-of-way.
Tree Removal (cont'd)	DMMC 16.25.060 Tree removal, cutting, and pruning limitations. In addition to the best pruning practices provisions codified in DMMC 16.25.070, the following limitations shall apply to removing, cutting, and pruning of trees: (2) Trees on City-Owned Property. (a) Removal of dead, diseased or hazard trees as determined and/or verified by the City or as determined by a certified arborist; (d) Removal of significant trees; provided, that the removal of significant trees is subject to tree replacement ratio of 3:1.	Applies for the tree obstruction that is partially located on City street right-of-way – another public safety provision.

4 Approach to Tree Replacement

As described in Section 3, the Port and WSDOT have established specific tree replacement ratios for tree removal on their properties. However, local municipal codes for the cities of Burien and SeaTac do not provide tree replacement requirements outside of development standards, which are not applicable to the Flight Corridor Safety Program (FCSP). In the absence of an applicable standard, the Port has chosen to provide a consistent level of tree replacement for properties within the three municipalities, as shown in Table 7.

The location for tree replacement plantings is also shown in Table 7, indicating flexibility for property owners to choose the location of replanted trees. Replacement tree species will consist of native or ornamental varieties with mature heights that would not become future obstructions. An Implementation Plan for the FCSP provides more details on the methods for tree removal, replacement, and monitoring and provides further details on tree replacement ratios and planting locations.

Table 7
Tree Replacement Ratios

Jurisdiction	Source of Standard	Applicable Replacement Ratio	Location of Tree Replacements
Port (outside of critical areas)	Port Landscape Design Standards	No replacement required[1]	Not applicable
Port (within critical area)	ILA/ City of SeaTac	3:1[2]	Port property
WSDOT	WSDOT Roadside Policy Manual	Based on tree diameter (i.e., DBH)[3]	WSDOT right-of-way (specific location to be determined)
City of SeaTac properties (other than WSDOT and Port-owned properties)	City of SeaTac code	None[4]	Within City limits[5]
City of Burien private property	City of Burien code	None[4]	Within City limits[5]
City of Des Moines public property[6]	City of Des Moines code	3:1	Within City limits[5]

Notes:

1. Per Section XII of the Port Landscape Design Standards, "All trees removed that were required by these Landscape Standards shall be replaced at time of removal, except when aviation safety is the reason for the removal." (Port of Seattle 2006)
2. Municipal code mitigation ratio for restoration (through reestablishment) of a Category II wetland (SMC 15.700.310 (G)).
3. WSDOT Roadside Policy Manual, Section 2.
4. Municipal code does not provide tree replacement requirements outside of development standards, which are not applicable to the Project.
5. The Port will coordinate with private property owners and municipalities regarding preferred replanting location.
6. The only tree obstruction in Des Moines is located on both private and public property; replacement ratio represents code requirements for public property.

DBH: diameter at breast height

5 References

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Attachment 1
Tree Obstruction List

Attachment 1
Tree Obstruction Listing

Tree ID	Jurisdiction	Owner type	Species	DBH (in)	Field Estimated Height
T0141	Burien	Private	PSME	36	120
T0312	Burien	Private	PSME	36	120
T0313	Burien	Private	PSME	36	120
T0314	Burien	Private	PSME	36	120
T0322	Burien	Private	PSME	36	120
T0323	Burien	Private	PSME	36	120
T0324	Burien	Private	PSME	36	120
T1042	Des Moines	Public + Private	PSME	38	110
T0110	Port	Port	POBA	36	70
T0115	Port	Port	POBA	50	13
T1351	Port	Port	PSME	42	110
T1583	Port	Port	PSME	33	132
T1664	Port	Port	PSME	23	126
T1718	Port	Port	PSME	30	135
T0395	SeaTac	Private	PSME	36	135
T0399	SeaTac	Private	PSME	33	130
T0866	SeaTac	Private	PSME	37	112
T1645	SeaTac	Private	PSME	36	135
T1693	SeaTac	Private	PSME	46	135
T1696	SeaTac	Private	PSME	37	140
T1700	SeaTac	Private	PSME	36	128
T1703	SeaTac	Private	PSME	37	130
T1716	SeaTac	Private	PSME	33	141
T1796	SeaTac	Public	PSME	32	123
T1920	SeaTac	Public	PSME	33	135
T1933	SeaTac	Private	PSME	42	150
T1950	SeaTac	Public	PSME	31	120
T1950i	SeaTac	Public	PSME	22	114
T1960	SeaTac	Public	PSME	26	120
T1960i	SeaTac	Public	PSME	34	125
T1962	SeaTac	Public	PSME	26	108
T1962i	SeaTac	Public	PSME	26	111
T1963	SeaTac	Public	PSME	18	108
T1964	SeaTac	Public	PSME	47	110
T2164	SeaTac	Public	PSME	37	140
T2170	SeaTac	Public	PSME	26	108
T2170i	SeaTac	Public	PSME	46	105
T2172	SeaTac	Public	PSME	28	120
T2175	SeaTac	Public	PSME	27	115
T2176	SeaTac	Public	PSME	27	120

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Tree Obstruction Listing

Tree ID	Jurisdiction	Owner type	Species	DBH (in)	Field Estimated Height
T2177	SeaTac	Public	PSME	29	120
T2178i	SeaTac	Public	PSME	26	120
T2180	SeaTac	Public	PSME	32	120
T2182	SeaTac	Public	PSME	22	100
T2223	SeaTac	Public	PSME	24	114
T2226	SeaTac	Public	PSME	29	112
T2227	SeaTac	Public	PSME	26	120
T2232	SeaTac	Public	PSME	24	108
T2233	SeaTac	Public	PSME	28	105
T2246	SeaTac	Public	PSME	25	108
T2248	SeaTac	Public	PSME	33	123
T2249	SeaTac	Public	PSME	32	114
T2253	SeaTac	Public	PSME	21	110
T2255	SeaTac	Public	PSME	35	114
T2265	SeaTac	Public	PSME	31	108
T2266	SeaTac	Public	PSME	31	115
T2267	SeaTac	Public	PSME	35	117
T2268	SeaTac	Public	PSME	33	122
T2327	SeaTac	Public	PSME	30	130
T2471	SeaTac	Public	PSME	37	114
T2472	SeaTac	Public	PSME	28	110
T2481	SeaTac	Public	PSME	32	115
T2482	SeaTac	Public	PSME	19	105
T2483	SeaTac	Public	PSME	36	116
T2484	SeaTac	Public	PSME	28	117
T2486	SeaTac	Public	PSME	27	110
T2487	SeaTac	Public	PSME	29	115
T2492	SeaTac	Public	PSME	36	125
T2509	SeaTac	Public	PSME	35	116
T2911	SeaTac	Public	PSME	25	108
T0596	WSDOT	Public	POBA	19	105
T0673	WSDOT	Public	PSME	19	46
T0688	WSDOT	Public	POBA	33	105
T0697	WSDOT	Public	POBA	37	100
T0700	WSDOT	Private	POBA	12	72
T0807	WSDOT	Public	POBA	40	108
T1201	WSDOT	Public	PSME	42	141
T1202	WSDOT	Public	PSME	48	125
T1207	WSDOT	Public	PSME	44	144
T1218	WSDOT	Public	PSME	37	144

Tree ID	Jurisdiction	Owner type	Species	DBH (in)	Field Estimated Height
T1294	WSDOT	Public	PSME	52	135
T1350	WSDOT	Public	PSME	27	120
T1357	WSDOT	Public	PSME	26	120
T16325	WSDOT	Public	ARME	31	60
T1691	WSDOT	Public	PSME	32	120
T1795	WSDOT	Public	PSME	40	140
T1838	WSDOT	Public	PSME	36	126
T1844	WSDOT	Public	PSME	37	120
T1850	WSDOT	Public	PSME	32	115
T1852	WSDOT	Public	PSME	39	120
T1856	WSDOT	Public	PSME	32	115
T1862	WSDOT	Public	PSME	30	120
T1877	WSDOT	Public	PSME	36	126
T1878	WSDOT	Public	PSME	32	115
T1880	WSDOT	Public	PSME	21	110
T1882	WSDOT	Public	PSME	33	110
T1898	WSDOT	Public	PSME	31	125
T1930	WSDOT	Public	PSME	36	129
T1955	WSDOT	Public	PSME	34	90
T1956	WSDOT	Public	PSME	31	90
T1957	WSDOT	Public	PSME	39	120
T1958	WSDOT	Public	PSME	19	100
T1959	WSDOT	Public	PSME	29	114
T1968	WSDOT	Public	PSME	23	110
T1969	WSDOT	Public	PSME	30	115
T1984	WSDOT	Public	PSME	36	110
T1986	WSDOT	Public	PSME	26	115
T1987	WSDOT	Public	PSME	28	115
T1991	WSDOT	Public	PSME	39	120
T1995	WSDOT	Public	PSME	32	126
T1997	WSDOT	Public	PSME	31	110
T2004	WSDOT	Public	PSME	37	110
T2008	WSDOT	Public	PSME	29	114
T2009	WSDOT	Public	PSME	38	126
T2015	WSDOT	Public	PSME	27	100
T2018	WSDOT	Public	TSHE	26	110
T2173	WSDOT	Public	PSME	24	110
T2204	WSDOT	Public	PSME	19	115
T2205	WSDOT	Public	PSME	21	108
T2207	WSDOT	Public	PSME	29	95

Tree ID	Jurisdiction	Owner type	Species	DBH (in)	Field Estimated Height
T2209	WSDOT	Public	PSME	31	116
T2210	WSDOT	Public	PSME	39	115
T2211	WSDOT	Public	PSME	29	105
T2213	WSDOT	Public	PSME	26	105
T2216	WSDOT	Public	PSME	34	111
T2222	WSDOT	Public	PSME	24	108
T2224	WSDOT	Public	PSME	22	105
T2225	WSDOT	Public	PSME	22	105
T2230	WSDOT	Public	PSME	34	110
T2231	WSDOT	Public	PSME	26	105
T2234	WSDOT	Public	PSME	34	111
T2238	WSDOT	Public	PSME	21	105
T2335i	WSDOT	Public	ACMA	40	60
T2347	WSDOT	Public	POBA	27	110
T2356	WSDOT	Public	POBA	17	92
T2357	WSDOT	Public	POBA	30	90
T2358	WSDOT	Public	POBA	36	90
T2358I	WSDOT	Public	POBA	25	112
T2377	WSDOT	Public	PSME	38	120
T2393	WSDOT	Public	PSME	36	120
T2528	WSDOT	Public	PSME	31	105
T2531	WSDOT	Public	PSME	38	110
T2537	WSDOT	Public	PSME	25	108
T2540	WSDOT	Public	PSME	29	115
T2543	WSDOT	Public	PSME	27	120
T2559	WSDOT	Public	PSME	26	110
T2564	WSDOT	Public	PSME	31	115
T2566	WSDOT	Public	PSME	46	145
T2567	WSDOT	Public	PSME	38	138
T2587	WSDOT	Public	PSME	37	120
T2660	WSDOT	Public	PSME	33	115
T2661	WSDOT	Public	PSME	31	105
T2662	WSDOT	Public	PSME	35	120
T2675	WSDOT	Public	PSME	48	125
T2691	WSDOT	Public	PSME	29	105
T2699	WSDOT	Public	PSME	36	90
T2704	WSDOT	Public	PSME	30	90
T2709	WSDOT	Public	PSME	40	125
T2715	WSDOT	Public	TSHE	22	90
T2718	WSDOT	Public	PSME	32	120

Attachment 1
Tree Obstruction Listing

Tree ID	Jurisdiction	Owner type	Species	DBH (in)	Field Estimated Height
T2736	WSDOT	Public	PSME	32	130
T2740	WSDOT	Public	PSME	22	110
T2754	WSDOT	Public	PSME	40	114
T2763	WSDOT	Public	PSME	32	120
T2764	WSDOT	Public	PSME	35	126
T2765	WSDOT	Public	PSME	32	130
T2766	WSDOT	Public	PSME	30	135
T2775	WSDOT	Public	PSME	35	135
T2781	WSDOT	Public	PSME	34	130
T2832	WSDOT	Public	POBA	42	125
T2839	WSDOT	Public	POBA	38	115
T2844	WSDOT	Public	POBA	29	120
T2866	WSDOT	Public	PSME	38	125
T2867	WSDOT	Public	PSME	41	125

Attachment 2
Informational Permit Folios

Significant Tree Removal/Pruning Application

400 SW 152nd Street, Suite 300 Burien, WA 98166
Phone: (206) 241-4647 ● FAX: (206) 248-5539
www.burienwa.gov

Permit Number

_____

APPLICANT INFORMATION	
Name:	Company:
Address:	Daytime Phone:
City, State, Zip:	E-Mail:

PRIMARY CONTACT PERSON (If Different)	
Name:	Company:
Address:	Daytime Phone:
City, State, Zip:	E-Mail:

PROPERTY OWNER	
Name(s):	
Address:	Daytime Phone:
City, State, Zip:	E-Mail:

PROJECT & SITE INFORMATION	
Street Address:	Assessor's Parcel Number(s):
Short Project Description:	

SIGNATURE:

I declare that I am the owner of the property involved in this application, and that all information submitted with this application is complete and correct to the best of my knowledge and belief. I understand that any errors and/or omissions may lengthen the time needed to process this request.

Signature: _____ Address: _____ Date: _____

Signature: _____ Address: _____ Date: _____

Signature: _____ Address: _____ Date: _____

Signature: _____ Address: _____ Date: _____

Significant Tree Removal/Pruning Handout

The City of Burien recognizes the significant role that the natural environment plays in creating a healthy and attractive community. Trees, landscaping and open space all contribute to a positive community image. Two sections of the Burien Municipal Code (BMC) apply to tree retention and removal. Section 19.25.120 contains requirements for retention of significant trees on vacant lots and section 19.40 applies to all properties containing a "critical area" (steep slope, seismic hazard area, erosion hazard area, stream or wetland). The following are frequently asked questions about tree retention in Burien.

General Questions

Q: WHAT IS A SIGNIFICANT TREE?
A: A significant tree is an existing healthy tree which, when measured four feet above grade, has a minimum diameter of 6 inches.(BMC 19.10.493)

Q. HOW DO I SHOW THE LOCATION OF SIGNIFICANT TREES ON MY PLANS?
A. All significant trees on your property must be shown on your site plan. The accurate location of the trees, approximate size (in diameter) and tree species must be shown. The plan also needs to show which trees you'll save and which trees you'll remove. (BMC 19.25.130)

Q. HOW DO I PROTECT SIGNIFICANT TREES DURING CONSTRUCTION?
A. A temporary but immovable five-foot high chain link or plastic net fence must be installed around the "dripline," or farthest extent of the tree's branches, of all significant trees to be saved. Due to potential damage to the tree, no construction, fill, excavation or storage of construction materials is allowed inside of the dripline. (BMC 19.25.150)

Q. HOW DO I FIND AN ARBORIST?
A. A list of consulting arborists can be found on the Pacific Northwest Chapter, International Society of Arboriculture website at www.pnwisa.org.

Tree Retention in Critical Areas and their Buffers

Q. DO I NEED A PERMIT TO REMOVE OR PRUNE A TREE IN A CRITICAL AREA OR ITS BUFFER?
A. Yes. If your property contains a "critical area" (such as steep slopes, streams or wetlands), permits are required to remove or prune a tree in a critical area or its buffer. (Right-of-way permits are required to remove or prune any tree located in the right-of-way.) To remove a tree, you will need to submit a vegetation management plan and permit application to the Department of Community Development for review. We require contracting with a certified arborist or experienced tree service when pruning trees to ensure the tree's long-term health.

Q. DO I NEED A PERMIT TO ALTER THE VEGETATION IN A CRITICAL AREA OR ITS BUFFER (e.g. REMOVE GROUND COVER, PRUNE OR REMOVE TREES OR SHRUBS)?
A. Generally, yes. Significant alterations that may affect the critical area require permits. Please contact a planner for additional questions.

Q. CAN I REMOVE DEAD, DISEASED OR DANGEROUS TREES?

A. Yes, a permit and vegetation management plan are required to remove a dead, diseased, or dangerous tree(s). The City requires a report from a qualified professional attesting to the health of the tree.

Q. WHAT IS A VEGETATION MANAGEMENT PLAN?

A. A vegetation management plan identifies the proposed clearing limits for the project and any areas where vegetation in a critical area or its buffer is proposed to be disturbed. The plan should describe the methods of any work to be completed. The plan should also address any alternative methods of attaining your goal and explain how the proposed activity will not be detrimental to surrounding properties and to the functions and values of the associated critical area.

Tree Retention in Non-Critical Areas

Q. DO I NEED A PERMIT TO REMOVE A SIGNIFICANT TREE IN A NON-CRITICAL AREA?

A.
- For undeveloped/vacant lots tree removal is not permitted until time of development. When developing your lot, you will need to submit a tree retention site plan to the Department of Community Development for review.
- For developed, private lots tree removal and pruning are allowed without a permit.
- For removal and pruning of ANY trees in the right-of-way, a right-of-way permit is required.

Q: HOW MANY SIGNIFICANT TREES DO I NEED TO SAVE WHEN DEVELOPING MY PROPERTY?

A: The amount of trees required to be retained depends on the type of development and the zoning of neighboring properties (BMC 19.25.120).

Q. WHAT IF I CAN'T SAVE ALL OF THE TREES I AM REQUIRED TO SAVE?

A. You may plant new trees to compensate for the removal of significant trees (BMC 19.25.160). Replacement trees also must be shown on the site plan. Please discuss these requirements with a planner at (206) 241-4647.

Q. WHAT IS A TREE RETENTION PLAN?

A. A tree retention plan identifies the location, size and species of all significant trees on the site, and shows which significant trees are proposed to be retained, transplanted or restored. The plan should also include a description of how the work is to be completed. There is a fee for review of this plan.

Significant Tree Removal/Pruning Checklist

PLEASE RETURN THIS CHECKLIST WITH YOUR APPLICATION

The following is a list of materials and plans which must be submitted in order to have a complete application. For some applications, it will not be necessary to submit all of the listed materials. Consult with the Department of Community Development if you have questions.

Application	REQUIRED	PROVIDED
A completed, signed, Significant Tree Removal Application Form.	X	

Fees	REQUIRED	PROVIDED
A check payable to the City of Burien for applicable filing fees.	X	

Site Plan	*REQUIRED*	*PROVIDED*
Two (2) copies of dimensioned plans. See attached sample site plan.	*X*	
1. Property dimensions, any existing structures which are proposed to remain on the property, and names of adjacent rights-of-way. A property survey is recommended but is not required.		
2. Existing streams, lakes, and shorelines, structures, rockeries, roadways and other relevant man-made or natural features.		
3. All existing trees 6" or more in diameter measured at 4-feet above grade, by species, and an indication of which will be saved. The dripline and trunk locations should be accurately depicted.		
4. Proposed replacement trees, if required: size, species, location and distance apart.		
5. Existing and finished grades at 5-foot contours with the precise slope of any area in excess of 40 percent.		
6. The location and type of any critical areas and their required buffers, on and within 100 feet of your property.		

Project Description	REQUIRED	PROVIDED
A project description by a certified arborist or qualified tree professional explaining how the work will be completed.	X	
For Vegetation Management Plans in the Critical Areas, the project description should also explain how any critical area will be protected and how the site will be revegetated, if needed. In addition, the description should address any alternative methods of attaining the applicant's goal and explaining how the proposed activity will not be detrimental to surrounding properties and to the functions and values of the associated critical area.		

Governor's Office for Regulatory Innovation and Assistance

NPDES Construction Stormwater General Permit

Applicant | **Department of Ecology** | **Public or other interested party**

Application Phase

Start

Applicant reviews activities requiring a Construction Stormwater General Permit

A

not required → **No Permit Required**

required

Applicant submits Notice of Intent (NOI) form – includes information on SEPA and other requirements as noted

B

Applicant submits Public Notice to newspaper (to be published after Ecology receives NOI)

Review and Issuance Phase

Ecology reviews NOI for completeness — 10 days

- **Incomplete**
- **Complete**

C

Public can submit written comments to Ecology — 30 days

Ecology reviews application information and public input

Public can request a Public Hearing from Ecology

Ecology evaluates requests for public hearing, if any. If hearing held, Ecology reviews testimony provided in public hearing

- **Hearing Not Needed**
- **Hearing Needed** — 30 days

Ecology holds Public Hearing

Ecology makes permit determination

- **Deny**
- **Issue**

31 days

Appeal Phase

Permit Denied

Applicant may appeal decision to Washington Pollution Control Hearing Board (PCHB)

D

Permit Issued

Public may appeal decision to Washington Pollution Control Hearing Board (PCHB)

D

Legend: A =Hyperlink → =Progression — → =Revision ····▸ =Optional

For more information on this or any permitting process visit http://www.oria.wa.gov or call the Governor's Office for Regulatory Innovation and Assistance at (800) 917-0043

Rev. 2014 04 03

Governor's Office for Regulatory Innovation and Assistance

NPDES Construction Stormwater General Permit

Link A

A. Triggers for Construction Stormwater Permitting

New Permit Coverage is required for:

- Construction activities with any soil disturbance of 1 acre or greater of total land area and have a discharge of stormwater from the site into surface water(s), or into storm drainage systems which
- discharge to a surface water. Surface waters may include wetlands, ditches, rivers, unnamed creeks, lakes, estuaries and marine waters.
- Construction activity is defined as land disturbing operations including clearing, grading and excavation.
- One acre threshold also includes construction activities that result in a land disturbance of less than 1 acre, if the activity is part of a larger common plan of development or sale that is equal to or greater than one acre.

Erosivity Waiver:

The erosivity waiver is available for construction projects **under 5 acres** (and not part of a common plan of development) that are started and completed within certain dry periods in the state. The entire period of construction activity must fall within the following dates of the same year.

- For sites west of Cascades Crest: June 15-September 15
- For sites east of Cascades Crest, except the Central Basin: June 15-October 15
- For sites within the Central Basin (region 2) of Eastern Washington: No time restriction apply

The Central Basin is an area of central eastern Washington with less than 12 inches of precipitation per year (see Region 2 on the map attached to the erosivity waiver form).

In order to qualify, the rainfall erosivity factor must be less than 5 during the period of construction activity. To calculate rainfall erosivity, go to the U.S. EPA's Rainfall Erosivity Factor Calculator.

Submit an erosivity waiver form to Ecology at least one week before starting soil disturbing activities. If the operator meets all the requirements of the erosivity waiver, he/she does not need a permit for construction stormwater discharges.

A Permit Coverage is not required for:

- Sites at which all the stormwater is retained on site (discharges to the ground through infiltration basins, dry wells, drain field, or other means of discharge to the ground). Sites which must build these
- retention devices do require coverage.
- Any part of a facility with a stormwater discharge resulting from remedial action conducted by the USEPA or Ecology or a potentially liable/responsible person under an order or consent decree issued
- under the Comprehensive Environmental Response, Compensation, and Liability Act.
- Emergency construction required to protect public health and safety.
- Construction activity for routine maintenance of existing facilities to maintain original line and grade, or hydraulic capacity.
- Nonpoint sources silvicultural (forestry) activities.
- Stormwater from any Federal Operator or land within an Indian Reservation except for the Puyallup Reservation. Within the Puyallup Reservation, any project that discharges to surface water on land held in trust by the federal government may be covered by this permit.
- Facilities covered under existing NPDES individual or general permits in which stormwater management or treatment associated with construction activity is already addressed. Check with the Ecology permit manager about this exemption.

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Link D

D. Appeal Information

Appeal of Permit Coverage:

You have a right to appeal the terms and conditions of a general permit, as they apply to an individual discharger, to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this letter. This appeal is limited to the general permit's applicability or non-applicability to a specific discharger. The appeal process is governed by chapter 43.21B RCW and chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal, you must do the following within 30 days of the date of receipt of this letter:

- File your appeal and a copy of the permit cover page with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and the permit cover page on Ecology in paper form - by mail or in person (see addresses below). E-mail is not accepted.

You must also comply with other applicable requirements in chapter 43.21B RCW and chapter 371-08 WAC.

Location and Mailing Address Information:

Street Addresses:
Department of Ecology
300 Desmond Drive SE
Lacey, WA 98503

Mailing Addresses:
Department of Ecology
Attn: Appeals Processing Desk
PO Box 47608
Olympia, WA 98504-7608

Pollution Control Hearings Board
1111 Israel Road SW, Suite 301
Tumwater, WA 98501

Pollutions Control Hearings Board
PO Box 40903
Olympia, WA 98504-0903

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CLEARING, GRADING AND TREE CUTTING

PERMIT CHECKLIST

PUBLIC WORKS BUILDING DIVISION
206-973-4750

INFORMATION:

Grade or Fill Projects OVER 500 CUBIC YARDS Require SEPA Checklist Approval from the City of SeaTac Planning Department PRIOR to Applying for a Building Permit.

SeaTac Municipal Code 13.11 Exempts the Following from Grading Permit Requirements: (*Except in Sensitive Areas, e.g., wetlands, steep slopes).*

1. EXCAVATIONS LESS THAN FIVE FEET DEEP AND LESS THAN 50 CUBIC YARDS.

2. FILL LESS THAN THREE FEET HIGH AND LESS THAN 50 CUBIC YARDS.

SeaTac Municipal Code 15.14 Exempts ALL Residential Tree Cutting and the Following Commercial Work: *(Except in Sensitive Areas, e.g., wetlands, steep slopes).*

1. CLEARING OF BRUSH (NOTE: If bare earth is to be exposed, an approved erosion control system must be installed on the site.)

2. CUTTING TREES LESS THAN EIGHT INCHES IN DIAMETER.

The Following Documentation must be submitted when applying for a permit :

___Sensitive Area *(See Department of Planning & Community Development)*

___ Completed Permit Application

___ Copy of Contractor's State License

___ Verification of Contractor's City of SeaTac Business License (*See Finance Department)*

___ Receipt of Initial Plan Review Fee

___ Indicate the Start and Completion Dates of the Grade or Fill Project

__**THREE (3)** SETS OF PLANS *(24"x 36" Minimum Size)*

1. SITE PLAN
   - ___Property Lines, Building(s), Adjacent Streets
   - ___Contours at Five Foot Elevation Intervals
   - ___Cross Sections
   - ___Identification of Sensitive Areas (*Streams, wetlands, slopes, etc.)*
   - ___Location of All Trees Over Eight Inches in Diameter

2. ENGINEERED DRAINAGE PLAN including Design Calculations per 1990 King County Surface Water Design Manual with Revisions *(Unless Waived by Public Works Engineering Division).*

3. EROSION AND SEDIMENTATION CONTROL PLAN

4. REVEGETATION/DEVELOPMENT PLAN

APPENDIX C

Seattle-Tacoma International Airport
Flight Corridor Safety Program
Implementation Plan 2019

November 2019
Seattle-Tacoma International Airport Flight Corridor Safety Program

ANCHOR QEA

Implementation Plan 2019

Prepared for Port of Seattle

Port of Seattle

November 2019
Seattle-Tacoma International Airport Flight Corridor Safety Program

Implementation Plan 2019

Prepared for
Port of Seattle
P.O. Box 68727
Seattle, Washington 98168

Prepared by
Anchor QEA, LLC
1201 3rd Avenue, Suite 2600
Seattle, Washington 98101

Project Number: 160003-01.23
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ABBREVIATIONS

BMP	best management practice
Burien	City of Burien
Des Moines	City of Des Moines
FAA	Federal Aviation Administration
LiDAR	Light Detection and Ranging
Port	Port of Seattle
Program	Flight Corridor Safety Obstruction Management Program
ROW	right-of-way
SeaTac	City of SeaTac
SEPA	State Environmental Policy Act
SR	State Route
STIA	Seattle-Tacoma International Airport
WSDOT	Washington State Department of Transportation

1 Introduction

The Port of Seattle (Port) is implementing a Flight Corridor Safety Obstruction Management Program (Program) to maintain navigable airspace at Seattle-Tacoma International Airport (STIA). The Program ensures compliance with the requirements of the Federal Aviation Administration (FAA) for safe operation of aircraft during takeoff and landing at STIA by removing objects identified as hazardous obstructions to air navigation.

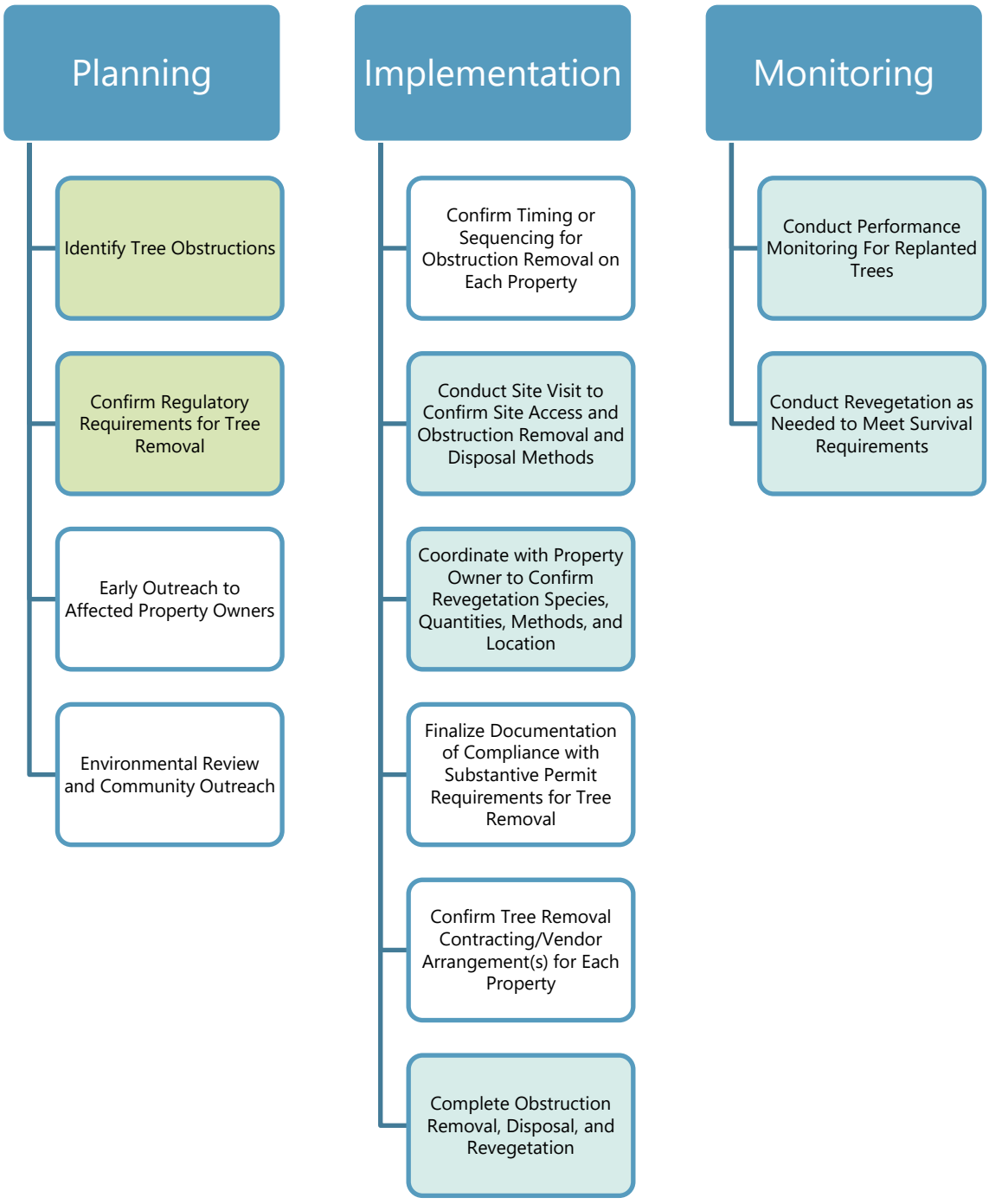
In 2014, the Port completed a Light Detection and Ranging (LiDAR) survey to identify objects penetrating flight safety surfaces, including their relative elevation. In 2016, the Port completed a State Environmental Policy Act (SEPA) checklist, issued a Mitigated Determination of Non-Significance, and removed obstructions on Port property. A Regulatory Approach Memorandum and Implementation Plan were also developed to support the SEPA review and associated permitting (Anchor QEA 2016a and 2016b).

In 2018, the Port conducted a new LiDAR analysis and identified obstruction points on Port, public, and private property. Based on field verification of the LiDAR data, all the obstructions currently under review are trees (174 total). The Port intends to remove these obstructions as soon as early 2020 and will meet all applicable laws and regulations.

The Port will follow existing precedent for tree replacement on Port property, provide tree replacement consistent with jurisdictional standards to the extent practicable, comply with critical areas ordinances for trees in wetlands and buffer areas, and implement actions according to the environmental review process.

The purpose of this report is to provide a detailed methodology and timeline for removal of obstructions on Port, public, and private properties surrounding STIA. The report is a companion document to the *Seattle-Tacoma International Airport Flight Corridor Safety Program Regulatory Approach Memorandum* (Anchor QEA 2019), which identifies anticipated environmental requirements and permits needed to remove the obstructions as well as additional local standards with which the Port has chosen to comply with to the extent practicable. Figure 1 provides an overview of planning, implementation, and monitoring components of the Program.

Figure 1 Flight Corridor Safety Obstruction Management Program Overview



Green squares: Refer to *Seattle-Tacoma International Airport Flight Corridor Safety Program Regulatory Approach Memorandum* (Anchor QEA 2019)
Light blue squares: Components provided in Implementation Plan

1.1 Components of Implementation Plan

This report provides an inventory of the tree obstructions by jurisdiction and property ownership type. It then details planned obstruction removal and tree replacement by jurisdiction and ownership type and includes a discussion of obstruction management methods, a description of how these methods should be applied to each obstruction by jurisdiction, and a detailed schedule for implementing the Program.

Planned tree replacement quantities described in this document are approximate and are subject to change as environmental review and design are completed to meet substantive compliance.

1.2 Overview of Jurisdiction and Property Ownership

Obstructions occur on parcels under the jurisdiction of the Port, Washington State Department of Transportation (WSDOT), the city of Burien (Burien), the city of Des Moines (Des Moines), and the city of SeaTac (SeaTac). Obstructions are under private and public ownership. See Figure 2 for a site vicinity and location of obstructions and Figure 3 for obstructions and critical areas.

Local jurisdictions are generally the primary source of standards for tree removal and replacement. Each jurisdiction has unique requirements that inform obstruction management methods, specifically tree removal and replacement. Comprehensive obstruction removal and site management methods are included as Appendix A. For obstructions located in WSDOT jurisdiction, the Implementation Plan refers to the WSDOT Roadside Policy Manual.

Figure 2 **Site Vicinity and Location of Obstructions**

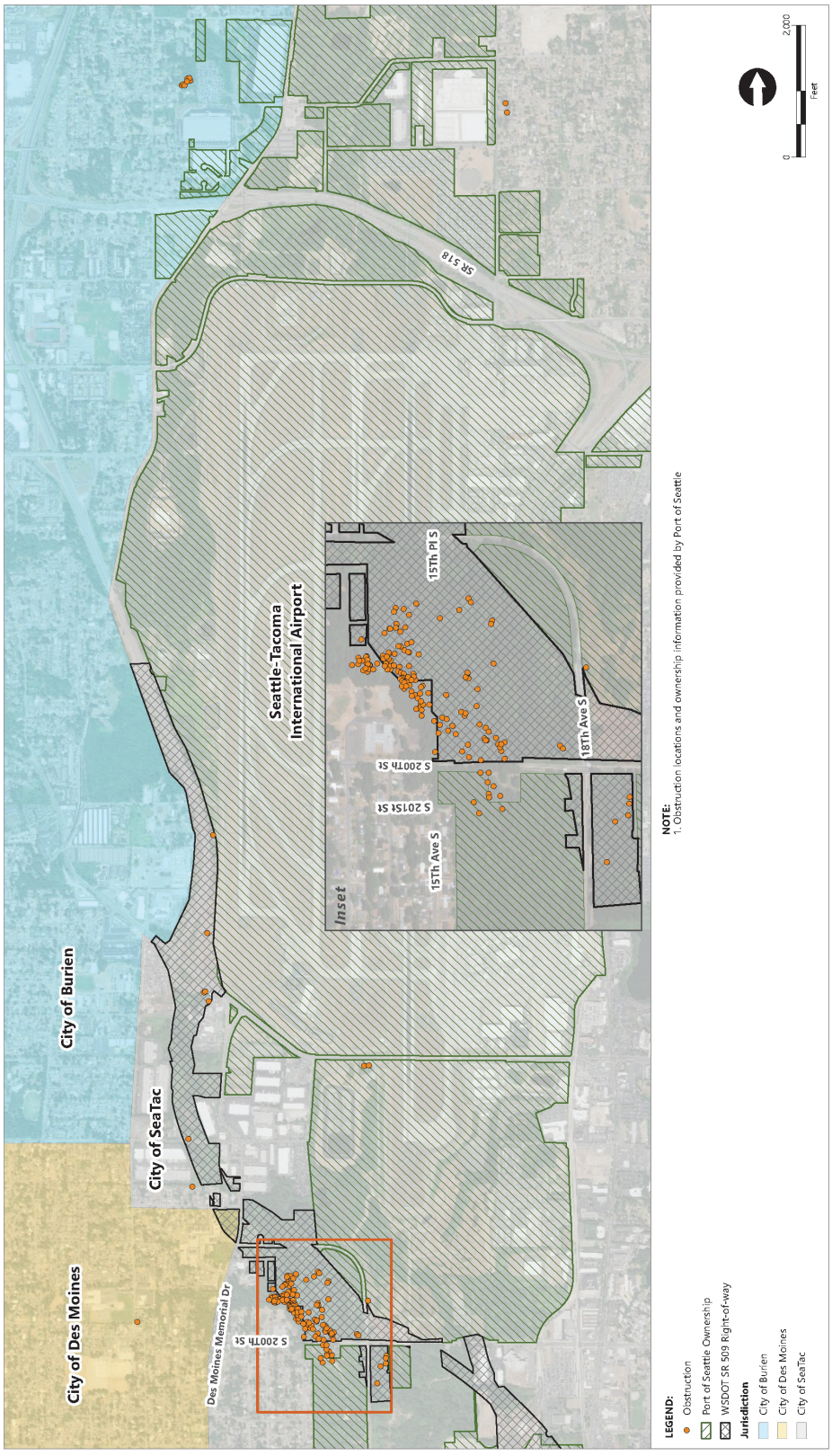
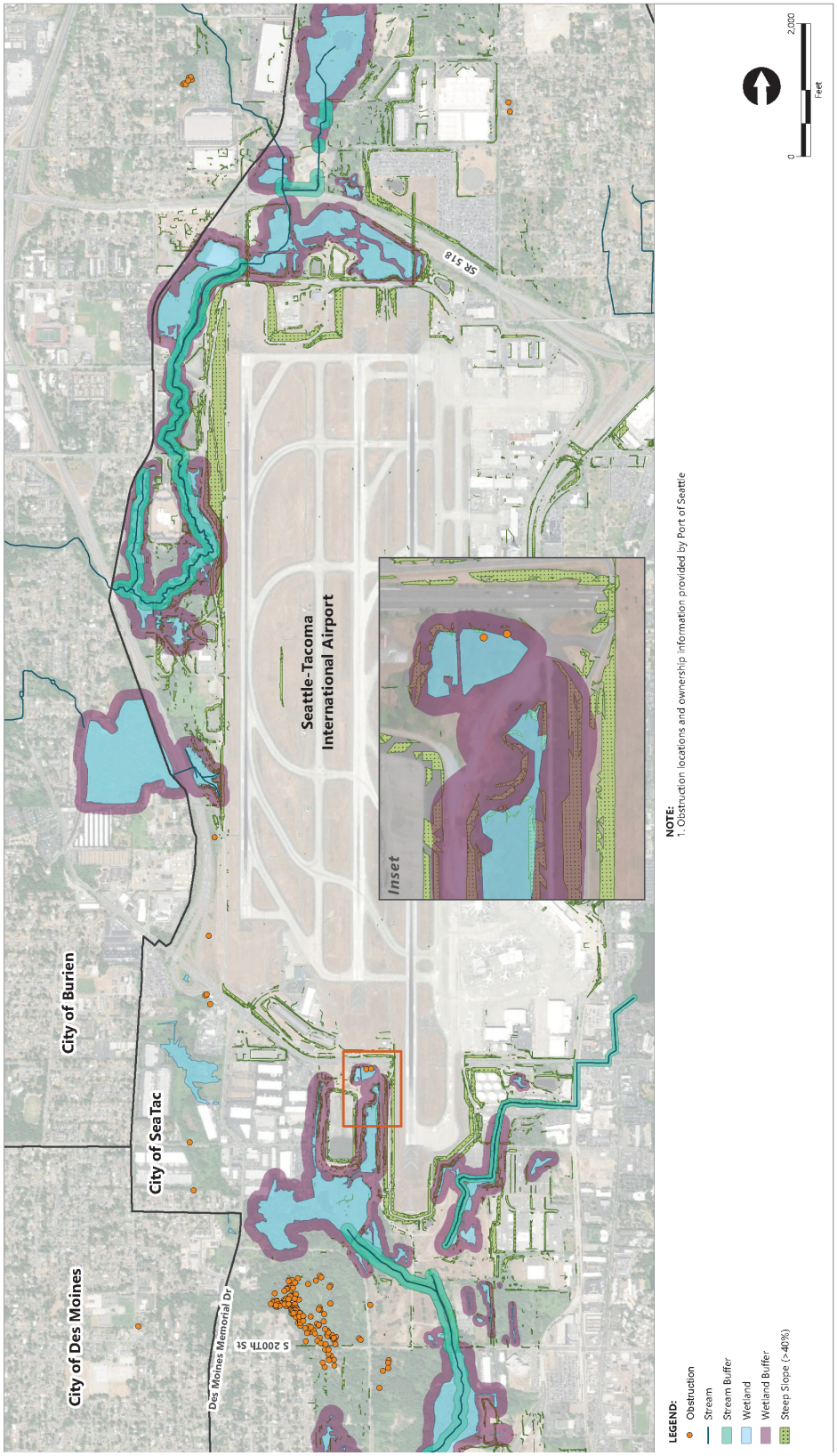


Figure 3 Location of Obstructions and Critical Areas



2 Obstruction Inventory

Table 1 summarizes the quantity of obstructions to be removed by jurisdiction. The table provides additional information for the obstructions located in SeaTac, Burien, or Des Moines jurisdiction, breaking down whether the obstruction is on public or private property. A detailed list of obstructions and their attributes is provided in the *Seattle-Tacoma International Airport Flight Corridor Safety Program Regulatory Approach Memorandum* (Anchor QEA 2019).

Table 1
Obstruction Removal Summary

Jurisdiction/ Property Ownership	Number of Obstructions	Notes
Port	**6**	Includes two obstructions in critical areas (one in a wetland and one in the wetland buffer).
WSDOT	**104**	Most obstructions are located on WSDOT ROW for the planned SR 509 extension project.
City of SeaTac		
Public	46	This category includes 27 obstructions located on Highline School District Property.
Private	10	Obstructions in this category are located on Hillgrove Cemetery and residential properties.
Subtotal	**56**	
City of Burien		
Public	0	
Private	7	Obstructions are located on a single vacant property zoned residential.
Subtotal	**7**	
City of Des Moines		
Public	1	Obstruction is located on the border of a residential property and City street ROW.
Private		
Subtotal	**1**	
Total	**174**	

Source: *Seattle-Tacoma International Airport Flight Corridor Safety Program Regulatory Approach Memorandum* (Anchor 2019)

Figure 2 demonstrates that approximately 60% of tree obstructions are in the State Route (SR) 509 right-of-way (ROW) and adjacent surplus property owned by WSDOT, which administers its own clearing standards. Remaining obstructions fall under SeaTac and Port jurisdiction with a limited number of trees within Des Moines (one obstruction) and Burien (seven obstructions) city limits.

Two obstructions occur on Port property in critical areas (e.g., streams, wetlands, and steep slopes). Figure 3 identifies the location of critical areas, indicating that the two obstructions are within a wetland and wetland buffer areas located on Port property.

3 Obstruction Removal and Revegetation Plans

This section outlines methods for specific obstruction removal and replacement by jurisdiction and ownership type (public or private). Table 2 summarizes the quantities of removal and revegetation for the different jurisdictions and ownership types. The tree planting planned quantities exceed the applicable regulatory replacement ratios presented in the *Seattle-Tacoma International Airport Flight Corridor Safety Program Regulatory Approach Memorandum* (Anchor QEA 2019). The Port has chosen to provide a consistent level of tree replacement for properties within the three municipalities, as shown in Table 2, and the Port will consider up to a 4:1 tree replacement ratio. As stated in Section 1.1, planned tree replacement quantities are approximate and are subject to change as environmental review and design are completed.

Table 2
Summary of Tree Removal and Replacement Quantities – All Sites

Jurisdiction/ Property Ownership[1]	Total Obstructions (Total Trees Removed)[1]	Port Tree Replacement Ratio	Planned Tree Replacement[2]
Port			
Outside of critical areas	4	4:1	16
Within critical area	2	4:1	8
WSDOT[3]			
All obstructions (Category 1 and 2 trees)[4]	104 (3,361 inches total trunk diameter including 1,022 inches of Category 1 and 2,294 inches total of Category 2)	Comply with WSDOT guidance; the ratio is based on tree diameter (i.e., DBH) and planting container size[3]	1,009–8,075
City of SeaTac (other than WSDOT and Port-owned properties)			
Public	46	Up to 4:1	46–184
Private	10	Up to 4:1	10–40
City of Burien			
Public	0	Up to 4:1	0
Private	7	Up to 4:1	7–28
City of Des Moines			
Public	1	Up to 4:1	1–4
Private			
Total	**174**		**1,097–8,355**

Notes:

1. The total does not include potential understory tree removal. If understory trees are removed, the replacement requirement would be considered using the planting ratios identified in the Program.
2. Required tree replacement quantities are based on mitigation ratios established by the Port. Actual tree replacement quantities may exceed the required ratios.

3. For obstructions in WSDOT ROW there is an option to provide tree replacement, to pay an in-lieu fee or provide a combination of tree replacement and in-lieu fee payment.
4. For obstructions in WSDOT ROW, the replacement ratio varies depending on the size of the tree removed, the size of the replacement tree, and if irrigation is installed. Refer to WSDOT Roadside Policy Manual (WSDOT 2015, Chapter 2).
    i. Obstructions considered Category 2 trees (moderate-size coniferous and other late successional species trees between 4 and 30 inches in diameter, measured 4.5 feet from the ground) will be replaced at a ratio of one 1-gallon replacement tree for each 1-inch of trunk diameter. Or, if larger container sizes are used, the plant quantity will be adjusted down. For example, if 2-gallon container plants are used, the replacement ratio is one 2-gallon replacement tree for each 2 inches of trunk diameter removed. If 5-gallon container plants and irrigation are used, the replacement ratio is one 5-gallon replacement tree for each 4 inches of trunk diameter removed.
    ii. Obstructions considered Category 1 trees (mature, old-growth, large specimen, or heritage trees greater than 30 inches in diameter, measured at 4.5 feet from the ground) require a higher ratio for replacement. Obstructions will be replaced at a ratio of three 1-gallon replacement trees for each 1-inch of trunk diameter. If larger container sizes are used, the plant quantity will be adjusted down.

DBH: diameter at breast height

This section is complemented by Appendix A, Obstruction Removal and Site Management Methods, which provides specifications and best management practices (BMPs) that will be applied during implementation, including the following:

1. Obstruction removal preparation
2. Obstruction removal and material disposal methods
3. Revegetation methods
4. Monitoring
5. Erosion and sediment control BMPs

3.1 Port Properties

Within Port properties, six obstructions require removal. These obstructions are south of the airfield. Access to three obstructions is actively controlled by the Port as they occur within Port property that is restricted from public use and fenced. The remaining three obstructions are located in an area that is publicly accessible for recreational use.

Two obstructions occur within critical areas. One obstruction is in a wetland, and the second obstruction is within the same wetland's buffer. Figure 3 identifies the location of critical areas and indicates the two obstructions within critical areas.

Access and Construction Staging

The obstructions located in areas actively controlled by the Port will need Port authorization and coordination for access. Access is as follows:

- The two obstructions located within critical areas can be accessed from the north via S 188th Street, which is a four-lane road with a center turning lane.
- One obstruction is located along 18th Avenue South and can be accessed from the edge of the roadway. Access will require fence removal and replacement.

- The three obstructions located in the publicly accessible area south of the airfield can be accessed from the north via S 200th Street. Access will require fence removal and replacement to avoid impacting vegetation and public walking/biking trails.

Site Condition Review

1. Hazards include non-critical slopes at the north portion of the site (16 degrees or 28.7%) and steep slopes (greater than 24 degrees or 44.5%), dense Himalayan blackberry brambles, congestion hazards while working near trails used for mountain biking, and potentially biohazards (syringes).
2. Critical areas that will be encountered during obstruction removal or while accessing the site include wetlands, wetland buffers, and steep slopes.
3. A concrete diversion dam at the wetland complex must be protected.
4. Other STIA-related infrastructure to be protected includes one stormwater retention basin.

Site Preparation

1. Critical area protection: Install sediment controls downstream of the work area and outside of the wetland boundary.
2. Infrastructure protection: Protect Port infrastructure by ensuring sediment control measures are in place prior to commencing obstruction removal site work, and by placing flagging or high-visibility fencing materials around features to alert operators from damaging them with their equipment. Biodegradable silt fencing is recommended as it can be left in place, further minimizing wetland impacts following projection completion.
3. Public safety protection: Fence off work that abuts publicly accessible roads and trails.
4. Fence removal: Obstruction removal area can be accessed directly off S 200th Street but two to three panels of chain-link fencing will need to be removed (and replaced following completion of site work).

Obstruction Removal and Material Disposal

1. Selectively remove and grind stumps of all obstruction trees outside of critical areas (four obstructions).
2. Selectively remove and retain stumps of all obstruction trees inside of critical areas (two obstructions).
3. Dispose of material off site, or chip and mulch material and place processed material on site (outside of the wetland). Dispose of all invasive vegetation debris in an approved off-site location.

Treatment

The objective of treatment measures is to control establishment of future obstructions, stabilize slopes and soil disturbed by obstruction removal, and replace trees on site to the extent possible.

1. Install geotechnical fabric (jute) in all cleared areas with slopes greater than 4:1 (4 horizontal to 1 vertical) prior to revegetation efforts.
2. Site restoration may include seeding and replacing and installing plants to compensate for damaged landscape areas, and filling ruts caused by equipment.
3. The required tree replacement quantity associated with obstruction removal is 24 trees planted on Port sites or another location within the drainage basin.
4. Tree replacement vegetation will be selected from the Approved Vegetation List (refer to Appendix B).
5. The estimated planting quantities will include the following:
    a. Trees planted in non-critical areas: 16
    b. Trees planted in wetland critical area: 4
    c. Trees planted in wetland buffer critical area: 4

Monitoring

1. Monitor stumps and treat with broad-spectrum glyphosate or fungus (mycilia) tablets to control resprouting. While black cottonwood sprouts from remaining stumps are unlikely to exceed 100 feet in height, these sprouts may still become future obstructions within the higher topography areas of the site.
2. Monitor for future obstructions.
3. Monitor to ensure revegetation areas meet the following performance standards:
    a. Performance Standard 1: Average survival of all native planted stock will be 100% at the end of Year 1 and at least 80% at the end of Year 2.
    b. Performance Standard 2: Invasive plant species are maintained at levels below 20% cover averaged over the entire obstruction removal area.

3.1.1 Best Management Practices

The BMPs listed in Table 3 are suitable measures for controlling sediment and erosion on Port sites.

Table 3
Port Site Best Management Practices

BMP Category	BMP Numbers and Titles
Preserve Vegetation/Mark Clearing Limits	• BMP C101: Preserving Natural Vegetation • BMP C102: Buffer Zones • BMP C103: High Visibility Plastic, Metal, or Biodegradable Fence • BMP C103: Silt Fence
Establish Construction Access	• BMP C105: Stabilized Construction Entrance/Exit • BMP C107: Construction Road/Parking Area Stabilization
Install Sediment Controls	• BMP C235: Wattles • BMP C233: Silt Fence
Stabilize Soil and Protect Slopes	• BMP C120: Temporary and Permanent Seeding • BMP C121: Mulching
Maintain BMPs and Manage the Project	• BMP C160: Certified Erosion and Sediment Control Lead • BMP C162: Scheduling

3.2 Public Properties

Public properties with obstructions include state-, city-, and school district-owned lots, some of which span multiple cities' properties. The largest group of obstructions on public land is on WSDOT ROW that is slated for redevelopment through the SR 509 extension project.

3.2.1 WSDOT Right-of-Way

There are 104 obstructions on WSDOT property, located primarily within WSDOT SR 509 ROW that require removal. These obstructions are south and west of STIA. One obstruction within the WSDOT SR 509 ROW is privately owned; the remaining 103 are publicly owned. There are no critical areas on these sites. In addition to identified tree obstructions, the WSDOT ROW contains a densely forested community with approximately 50% invasive species cover (invasive species include Himalayan blackberry, English ivy, common holly, and hawthorn). Ongoing encampments and illegal dumping require ongoing management, including provisions for construction security and safety.

The Port has met with WSDOT regarding the need for removal of obstructions on WSDOT property. WSDOT does not object to removing trees for the purposes of meeting STIA's flight corridor safety requirements. WSDOT has provided the Port with the relevant sections of the WSDOT Roadside Policy Manual so the Port can determine requirements for tree replacement within the WSDOT ROW. Most identified obstructions are anticipated for removal as part of the SR 509 extension project's implementation and their removal would have been mitigated by WSDOT on WSDOT ROW properties throughout Washington state.

All replacement trees will be planted in WSDOT ROW, and WSDOT will lead the tree replacement and revegetation effort. Because the obstructions are within the future SR 509 development area, tree replacement associated with WSDOT parcels may occur off site. To the extent possible, the Port will coordinate with WSDOT to install the replacement trees in the vicinity of STIA.

There are multiple approaches to tree replacement that could mitigate obstruction removal. The Port will coordinate with WSDOT to determine tree replacement, in-lieu fee payment, or a combination of tree replacement and in-lieu fee payment. For tree replacement and based on the WSDOT Roadside Policy Manual (WSDOT 2015) and in coordination with WSDOT (WSDOT 2019), there are several approaches to consider; each provides a variable mitigation area and installation construction cost. The selected approach would consider the following options:

- Install one 5-gallon tree for each 4 inches of trunk diameter removed.
  - Install irrigation.
  - Require 12 years of monitoring to ensure plant establishment.
- Install one 5-gallon tree for each 4 inches of trunk diameter removed.
  - Install irrigation.
  - Require 2 years of monitoring to ensure plant establishment.
- Install one 2-gallon tree for each 3.3 inches of trunk diameter removed.
  - Install irrigation.
  - Require 12 years of monitoring to ensure plant establishment.
- Install one 2-gallon tree for each 2 inches of trunk diameter removed.
  - Require 2 years of monitoring to ensure plant establishment.
- Install one 1-gallon tree for each 1 inch of trunk diameter removed.
  - Require 2 years of monitoring to ensure plant establishment.

Under the approaches listed above, potential tree replacement could install between 1,225 and 8,291 trees on WSDOT ROW and construction costs could range from $1,008,000 to $1,850,000.

Alternately, the Port could mitigate for tree obstruction removal through payment to WSDOT's in-lieu fee program. To offset the removal of 104 obstructions, the in-lieu fee could be approximately $1,200,500.

3.2.2 SeaTac

There are 46 obstructions on public property within SeaTac's jurisdiction that require removal. These obstructions are south, west, and north of STIA. Most obstructions are located on Highline School District Property. There are no critical areas on these sites.

Access and Construction Staging

Access and staging areas to be determined following coordination with property owners.

Site Condition Review

1. Utility locates will be required for all obstruction and potential obstruction removal areas.

Site Preparation

1. Public safety protection: Fence off work and staging areas that abut publicly accessible roads and recreation areas.
2. Verify trees for removal: Mark all trees for removal to be inspected by engineer prior to commencing removal activities.

Obstruction Removal and Material Disposal

1. Clear and grub all obstructions.
2. If conditions are found that prohibit full grubbing (e.g., protection of existing facilities), cut and grind stumps to meet finished grade and treat with broad-spectrum glyphosate or fungus (mycilia) tablets. Grinding stumps can lead to sinkholes and grade irregularities when the remaining root systems decompose overtime; therefore, grinding stumps should be a last resort over grubbing and only used where grubbing would damage facilities (e.g., structural foundations).
3. Dispose of material off site.

Site Treatment

1. Parcel owners may choose to replace the removed trees with the quantity identified in Table 2 and using the plant list in Appendix B for approved vegetation replacement.
2. Site restoration may include seeding and replacing and installing plants to compensate for damaged landscape areas, and filling ruts caused by equipment.

Monitoring

1. The Port will monitor obstruction removal locations to ensure that resprouting does not lead to future obstructions and that replacement vegetation is meeting performance standards. Where necessary, the Port will treat stumps to control resprouting and obstruction recurrence and, if needed, implement contingency measures to ensure success of replacement vegetation.

3.2.3 Des Moines

There is one obstruction on the boundary of the Des Moines ROW and a residential property. Refer to Section 3.3 (private properties) for direction on obstruction removal.

3.3 Private Properties

Private properties with obstructions are primarily found in residential areas, though there are several obstructions within Hillgrove Cemetery in SeaTac.

3.3.1 SeaTac

There are 10 obstructions located at the Hillgrove Cemetery and on residential properties. Further coordination is anticipated with the Hillgrove Cemetery prior to obstruction removal. There are no identified obstructions in critical areas.

Access and Construction Staging

Access and staging areas to be determined following coordination with property owners.

Site Condition Review

1. Utility locates will be required for all obstruction removal areas.

Site Preparation

1. Public safety protection: Fence off work and staging areas that abut publicly accessible roads and parking areas.
2. Verify trees for removal: Mark all trees for removal to be inspected by engineer prior to commencing removal activities.
3. Place steel plates or mats to provide access while protecting the ground: Provide barricades between structures and/or resident access routes and obstruction removal areas for safety and structure protection.

Obstruction Removal and Material Disposal

1. No ground disturbance shall occur within the Hillgrove Cemetery.
2. Clear and grub all obstructions.
3. If conditions are found that prohibit full grubbing, cut and grind stumps to meet finished grade and treat with broad-spectrum glyphosate or fungus (mycilia) tablets. Grinding stumps can lead to sinkholes and grade irregularities when the remaining root systems decompose overtime; therefore, grinding stumps should be a last resort over grubbing and only used where grubbing would damage facilities (e.g., structural foundations).
4. Selectively remove and grind stumps at cemetery, Do not grub or remove stumps at cemetery.
5. Dispose of material off site.

Site Treatment

1. Parcel owners may choose to replace the removed trees with the quantity identified in Table 2 and using the plant list in Appendix B for approved vegetation replacement.
2. Site restoration may include seeding and replacing and installing plants to compensate for damaged landscape areas, and filling ruts caused by equipment.

Monitoring

1. The Port will monitor obstruction removal locations to ensure that resprouting does not lead to future obstructions and that replacement vegetation meets performance standards. Where necessary, the Port will treat stumps to control resprouting and obstruction recurrence and, if needed, implement contingency measures to ensure success of replacement vegetation.

3.3.2 Burien

There are seven obstructions located on a single vacant property zoned residential. There are no critical areas on the property.

Access and Construction Staging

Access and staging area to be determined following coordination with the property owner.

Site Condition Review

1. Utility locates will be required for all obstruction and potential obstruction removal areas.

Site Preparation

1. Public safety protection: Fence off work and staging areas that abut publicly accessible roads and parking areas.
2. Verify trees for removal: Mark all trees for removal to be inspected by engineer prior to commencing removal activities.
3. Place steel plates or mats to provide access while protecting the ground: Provide barricades between structures and/or resident access routes and obstruction removal areas for safety and structure protection.

Obstruction Removal and Material Disposal

1. Clear and grub all obstructions.
2. If conditions are found that prohibit full grubbing, cut and grind stumps to meet finished grade and treat with broad-spectrum glyphosate or fungus (mycilia) tablets. Grinding stumps can lead to sinkholes and grade irregularities when the remaining root systems decompose overtime; therefore, grinding stumps should be a last resort over grubbing and only used where grubbing would damage facilities (e.g., structural foundations).
3. Dispose of material off site.

Site Treatment

1. Parcel owner may choose to replace the removed trees with the quantity identified in Table 2 and using the plant list in Appendix B for approved vegetation replacement. Selected trees will also avoid prohibited tree species per BMC 19.10.408.

2. Site restoration may include seeding and replacing and installing plants to compensate for damaged landscape areas, and filling ruts caused by equipment.

Monitoring

1. The Port will monitor obstruction removal locations to ensure that resprouting does not lead to future obstructions and that replacement vegetation meets performance standards. Where necessary, the Port will treat stumps to control resprouting and obstruction recurrence and, if needed, implement contingency measures to ensure success of replacement vegetation.

3.3.3 Des Moines

There is one obstruction on the boundary of the Des Moines ROW and a residential property. There are no critical areas in the areas with the identified obstruction.

Access and Construction Staging

An access and staging area to be determined following coordination with the property owner.

Site Condition Review

1. Utility locates will be required for the obstruction removal area.

Site Preparation

1. Public safety protection: Fence off work and staging areas that abut publicly accessible roads and parking areas.
2. Verify trees for removal: Mark the tree for removal to be inspected by engineer prior to commencing removal activities.
3. Place steel plates or mats to provide access while protecting the ground: Provide barricades between structures and/or resident access route and obstruction removal area for safety and structure protection.

Obstruction Removal and Material Disposal

1. Clear and grub obstruction.
2. If conditions are found that prohibit full grubbing, cut and grind the stump to meet finished grade. Grinding stumps can lead to sinkholes and grade irregularities when the remaining root systems decompose overtime; therefore, grinding stumps should be a last resort over grubbing and only used where grubbing would damage facilities (e.g., structural foundations).
3. Dispose of material off site.

Site Treatment

1. Parcel owner may choose to replace the removed trees with the quantity identified in Table 2 and using the plant list in Appendix B for landscape vegetation replacement.
2. Site restoration may include seeding and replacing and installing plants to compensate for damaged landscape areas, and filling ruts caused by equipment.

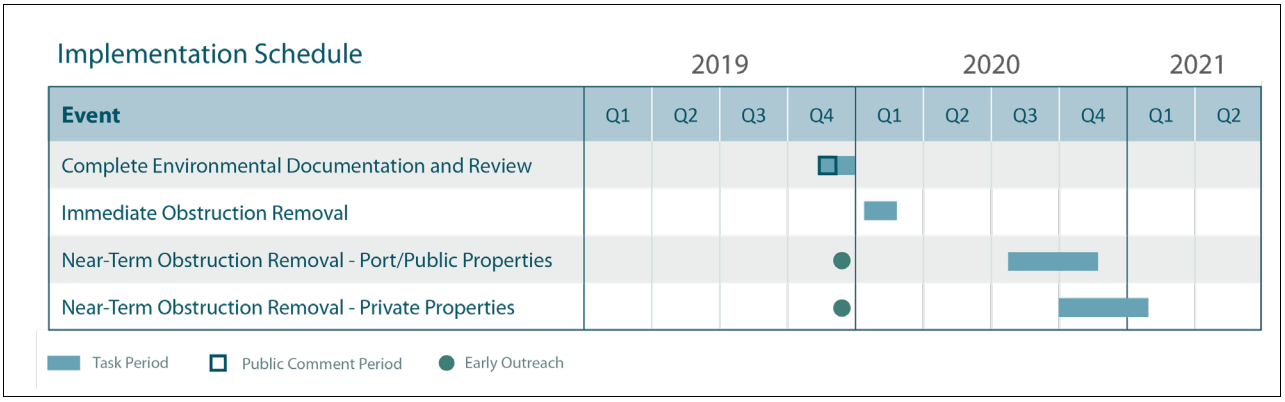
Monitoring

1. The Port will monitor obstruction removal locations to ensure that resprouting does not lead to future obstructions and that replacement vegetation meets performance standards. Where necessary, the Port will treat stumps to control resprouting and obstruction recurrence and, if needed, implement contingency measures to ensure success of replacement vegetation.

4 Schedule

4.1 Overall Schedule

The schedule for the overall Program is presented below. The process will include permitting obstruction removal for the entire project, coordination with public agencies and outreach and coordination with private property owners, and implementation of obstruction management.



4.2 Construction Sequencing

The Port plans to sequence obstruction management actions by first removing penetrating obstructions that affect flight operational pathways in February 2020. Of the identified 174 obstructions, 28 obstructions are identified for immediate removal. This includes trees topped in 2018, identified obstructions that are penetrating the operations surface (including two on the Hillgrove Cemetery property), and the remaining obstructions on Hillgrove Cemetery property. All obstructions identified for immediate removal are within the City of SeaTac (including WSDOT property) and outside critical areas. Table 4 identifies these obstructions by jurisdiction.

The remaining 146 near-term obstructions will be removed as soon as fall 2020, followed by tree replacement planting in winter 2020-2021. Coordination with private property owners to determine property access may require additional time.

Table 4
Obstruction Removal Sequencing

Jurisdiction/ Property Ownership	Number of Obstructions		Notes
	Obstructions Requiring Immediate Removal	Obstructions Requiring Near-Term Removal	
Port	**0**	**6**	
WSDOT	**16**	**88**	
City of SeaTac			
Public	6	40	
Private	6	4	All private trees identified for immediate removal are located on Hillgrove Cemetery property.
City of SeaTac Subtotal	**12**	**44**	
City of Burien	**0**	**7**	
City of Des Moines	**0**	**1**	
Total	**28**	**146**	

5 References

Anchor QEA (Anchor QEA, LLC), 2016a. Seattle-Tacoma International Airport Flight Corridor Safety Program Regulatory Memorandum. Prepared for: Port of Seattle. August 2016.

Anchor QEA, 2016b. Seattle-Tacoma International Airport Flight Corridor Safety Program Implementation Plan. Prepared for: Port of Seattle. August 2016.

Anchor QEA, 2019. *Seattle-Tacoma International Airport Flight Corridor Safety Program Regulatory Approach Memorandum*. Seattle-Tacoma International Airport Flight Corridor Safety Program. Prepared for Port of Seattle. November 2019.

WSDOT (Washington Department of Transportation), 2015. WSDOT Roadside Policy Manual. M 3110.03. August 2015. Available at: https://www.wsdot.wa.gov/Publications/Manuals/M3110.htm.

WSDOT, 2019. Coordination Meeting with WSDOT and the Port of Seattle. October 17, 2019.

Appendix A
Obstruction Removal and Site Management Methods

A-1 Obstruction Removal Preparation

Obstruction removal preparation activities include verifying/inspecting site conditions and could include identifying and installing access barriers, access routes, and staging areas; identifying and installing erosion and sediment control measures; salvaging vegetation; and marking obstructions and other features to be removed. For obstructions located in Washington State Department of Transportation (WSDOT) jurisdiction, the WSDOT clearing standards will apply as described in Section 3 of the Implementation Plan.

A-1.1 Sequencing

Before any work commences, the contractor will develop a proposed sequencing plan for obstruction removal. This plan must be confirmed by the Port of Seattle (Port) engineer.

A-1.2 Site Visit

Before any work commences, site visits will be held with both the contractor and Port engineer in order for the contractor to verify the following:

- **Hazardous features:** Permanent features should be marked/flagged to protect site personnel and biological hazards (e.g., unsanitary conditions, discarded syringes) should be identified and removed.
- **Access issues:** Traffic control measures may be required for obstruction removal along busy or congested public rights-of-way (ROWs).
- **Utilities in need of protection:** Stormwater and electrical utilities, including large stormwater ponds, will likely be the main utilities that will require protection. However, any areas that will require excavation for obstruction removal will also require a utility location/verification through the Utility Notification Center.
- **Existing facilities in need of protection:** These features could include Seattle-Tacoma International Airport (STIA) features such as the Air Operation Area (AOA) perimeter fence, the Port's west side office, or supports for runway approach lighting systems with flashing lights (ALSF). Existing facilities on private sites include structures, grounds, and landscaping outside of the obstruction removal area. Additional steel plates or mats and barricades will likely be required to safely remove obstructions on private sites without impacting existing structures.
- **Critical areas in need of protection:** These features could include steep slopes, wetlands, streams, and their buffers. In addition, topographic swales/ditches that could direct additional stormwater or sediment-laden runoff to these critical areas, and areas of potential erosion, should also be identified.

A-1.3 Access and Safety

Access barriers are necessary to control the removal area from trespass or unintentional entrance by unauthorized personnel during construction activities. While most Port sites have adequate access control from existing fencing, publicly accessible sites, such as the WSDOT ROW parcels near Highline School, will need to be barricaded. Temporary chain-link fencing, with 20-foot-wide lockable gates along the construction equipment access route(s), can provide a suitable barrier. Small public or private sites, or those along roadways, may require additional signs, barricades, or competent flaggers to ensure the public is protected from hazards associated with tree removal.

Access and exit points should be limited to one route, if possible. The route should be a truck or equipment driveway and should be stabilized to avoid tracking sediment on adjacent roadways. Stabilization can include placing a minimum 12-inch layer of 4- to 8-inch-sized quarry spalls over geotextile fabric, for a length of 25 feet and width of at least 15 feet. Longer access routes into a site may be required depending on the substrate/groundwater site characteristics and the size and weight of equipment used; pads of quarry spalls and geotextile can also be used for this application.

A-1.4 Tree Marking Confirmation

Prior to obstruction removal, the trees that will be removed should be confirmed and marked in multiple places on the trunk. This process is an important due diligence step to make sure that only the intended trees are removed.

A-1.5 Erosion and Sediment Control

Prior to obstruction removal, erosion and sediment controls will need to be planned and installed. Planning items will include development of a spill prevention, control, and countermeasures plan and consideration of overall site layout during construction. Fuel storage should be segregated from other materials and located at least 20 feet from streams and wetlands. The fuel storage area must be graded to ensure containment of any leaks or spills.

A-1.6 Plant Salvage – Optional Action

Through community service events, or partnering with native plant organizations, the Port may salvage native shrub and groundcover plant materials within the obstruction removal area for reuse. Plant materials should be carefully stockpiled for later relocation, exercising care when moving the plant materials to avoid breaking branches or roots. Salvaged vegetation may be used within cleared areas during the site treatment step in the process. This vegetation may also be used on other Port properties or provided for restoration work by other agencies (e.g., King County, EarthCorp).

A-2 Tree Obstruction Removal and Material Disposal

A-2.1 Tree Removal Methods

Obstruction removal methods and equipment vary depending on site characteristics, the distribution and characteristics of obstructions on a site, and the type of disposal method or sale of the cleared material. The range of tree removal and clearing methods, and their suitability, are summarized in Table A-1, followed by a more detailed discussion.

Table A-1
Summary of Obstruction Removal Methods

Method Description	Suitability
Tree Removal (excludes stump grubbing)	
Fell, limb, and buck trees using mechanical means and/or chain saws (manual) as needed. Remove invasive species, and retain, as practical, the remaining understory.	Suitable for areas with dense obstruction groupings where adjacent areas are not congested or major traffic corridors, and where full stump removal (grubbing) is not required
Selective Clearing and Tree Removal (manual work)	
Fell, limb, and buck trees using chain saws. Remove invasive species but retain remaining understory.	Suitable within or near critical areas, and/or where isolated obstructions occur, particularly on congested sites
Retain Stumps	
Follow tree removal or selective removal of trees, which leaves a 1- to 2-foot stump above the ground surface. To inhibit resprouting, stumps can be treated using broad-spectrum glyphosate or fungus (mycilia) tablets that encourage fungus to eat away at the remaining structure.	Suitable where isolated or small groupings of obstructions occur, and retaining stumps is used to protect critical areas like steep slopes or wetlands
Remove Stumps	
Cut or grind and mulch stumps, and the associated root mass below the ground level, using a stumper or stump grinder attachment. Another option is to use a grubbing blade mounted on the front of a carrier vehicle or cut a tree part-way down and push it over (clearing and grubbing operation).	Suitable on areas outside of critical areas

Tree removal could take the form of selectively removing trees with a chain saw or using mechanical means. Manual removal involves felling, limbing, and bucking trees using chain saws. A tree removal area that is congested and/or contains many existing facilities or grounds to be preserved, or is inaccessible to large equipment, will require manual methods of removal.

Mechanical felling has worker safety, productivity, and efficiency benefits compared to manual removal; however, this method is infeasible for certain sites where equipment cannot fit, or where

equipment would damage existing facilities or impact critical areas. Where feasible, mechanical felling is the best option for preparing timber for sale, which is an obstruction "disposal" option for many of the Port and WSDOT sites for this Flight Corridor Safety Obstruction Management Program (Program).

Common equipment used for large mechanical felling operations includes the following:

- Feller buncher, which has motorized vehicle base (tracked or wheeled) with a head that can cut and gather several trees at once; the most common tracked feller bunchers in the western United States are 12 feet wide, with excavator bases and swing booms with a 25-foot reach (USDA 2016)
- Delimber, which is used to remove branches from felled trees
- Harvester, which consolidates felling, delimbing, and bucking (cutting tree into appropriate lengths) into one machine
- Skidder, which is used to bundle and pull logs out of a forest
- Forwarder, which is a vehicle that uses a boom arm to load and carry logs out of the forest clear of the ground

Stump removal can occur using a grubbing blade (for clearing and grubbing operations) that can be mounted on the front of a carrier vehicle. Using this method, or cutting a tree part-way down and pushing it over, is an option to harvest material for large woody debris applications for restoration projects. Another option for stump removal is to cut or grind and mulch stumps, and the associated root mass below the ground level, using a stumper or stump grinder attachment. Grinding stumps can lead to sinkholes and grade irregularities when the remaining root systems decompose overtime. These grade irregularities are not an issue within natural forested areas, but they do have moderate safety implications on sites used by the public. Within private sites and recreation areas, grubbing, rather than grinding of stumps, is recommended.

Grubbing a clearing area (i.e., removing organic matter in the soil, often to a minimum of 12 inches in depth), provides an opportunity for stripping topsoil to be salvaged for use in future restoration planting efforts. Salvaged topsoil should be segregated and stockpiled separately from other cleared material; it can be spread over disturbed areas upon completion of obstruction removal activities. If a site will not support future planting, topsoil can alternatively be transported to other sites for use in restoration and revegetation efforts.

Areas within sites that are on steep slopes or in wetlands will benefit from retaining stumps after tree removal to stabilize soils and minimize impacts to these critical areas. To inhibit resprouting, stumps can be treated using broad-spectrum glyphosate, or using fungus (mycilia) tablets that encourage fungus to eat away at the remaining structure.

Erosion and sediment control measures will need to be actively managed during the obstruction removal phase of the Program. If monitoring or inspection shows that the control measures are ineffective, repairs should be made, or replacement measures should be installed. If sediment reaches one-third of the exposed height of the control measure, the sediment should be removed and disposed of properly.

A-2.2 Material Disposal Options

Options for disposal of obstructions are summarized in Table A-2, followed by a more detailed discussion.

Table A-2
Summary of Material Disposal Methods

Method Description	Suitability
On-Site Disposal (including chipping and mulching)	
Leave cleared materials on site with minimal processing, though cutting large tree pieces into manageable log segments may be required. Alternatively, material may be processed into wood chips/mulch, which can provide benefits to the site through invasive species control and soil nutrient inputs. On-site disposal cannot be used for invasive vegetation.	Suitable for most sites (with owner's permission), outside of wetlands. Not suitable for invasive material.
Off-Site Disposal	
Remove material from site and dispose at an approved location, or to a beneficial reuse site identified by the Port. Invasive vegetation must be disposed of off-site in an approved location.	Suitable for wetland areas where on-site disposal is not feasible, or other sites at owner's discretion. Required for invasive vegetation.
Timber Sale	
Establish board foot volumes, market, and prepare trees for sale.	Large, forested tracts with merchantable timber

A-2.3 On-Site Material Disposal

Cleared materials may be left on site with minimal processing, though cutting large tree pieces into manageable log segments may be required. Alternatively, material may be processed into wood chips/mulch, which can provide benefits to the site through invasive species control and soil nutrient inputs. For small diameter trees, this mulching option can be combined with the obstruction removal step through the use of a mechanical mulcher. Invasive vegetation cannot be disposed of on site. Disposing of material on site is not suitable for non-Port sites unless permission for this disposal method is approved by the owner. Disposing of material within wetland areas is also prohibited as this material could be interpreted as wetland fill.

A-2.4 Off-Site Material Disposal

Cleared material may be disposed of off site through the contractor taking ownership of the material and disposing of it at an off-site, permit-compliant location of their choosing. Alternatively, the Port may wish to take ownership of some of the cleared obstruction material for beneficial uses in other Port locations as restoration (e.g., large woody debris) or site furnishings (e.g., log edging, seating, or art features). This Port beneficial reuse option can be facilitated by identifying this material on site and specifying a location where the contractor can deliver the material to be stockpiled. Invasive vegetation must be disposed of off site in an approved location.

A-2.5 Marketing and Selling Timber

The Port and WSDOT may consider a timber sale as another option for material disposal. This option could provide significant revenue, but it also requires additional planning steps. Generally, the timber selling process would include the following:

- Researching the timber market condition and trends as they relate to desired species, minimum quantities, sizes, and material quality
- Refining a tree inventory to project the available timber volumes
- Developing a marketing strategy, guided by the following questions:
  - What are the products and when will they be available?
  - How will products be sold (stumpage [i.e., standing timber] or as logs)?
  - What is the current market value for these products?
  - Who are the potential buyers?
- Clearly laying out property lines of sale area and marking timber
- Promoting the products through actively contacting potential buyers and providing a prospectus
- Evaluating offers and drawing up a timber sale contract, and a logging contract for log products
- Actively monitoring the operation

A-3 Revegetation

Revegetation following obstruction removal will involve stabilizing soils using vegetation and, in certain instances, geotechnical methods. Closeout of the work will include removing temporary facilities and erosion/sediment control measures and cleaning up the site.

A-3.1 Revegetation Preparation

Soil preparation and the installation of erosion control fabrics (if warranted) will precede plant installation tasks. Soil amendment may be needed for areas with compacted soil or areas where an

excessive amount of topsoil was removed through obstruction removal operations. Soil amendment can be placed in planting areas and rototilled into the existing subgrade.

The installation of jute matting is recommended for sites with slopes greater than 4:1 (4 horizontal to 1 vertical) to control slopes during plant establishment. This material consists of unbleached, single jute yarn woven into a mat. Jute matting is installed by rolling out the fabric and, where multiple strips of mat are required, overlapping adjacent mats by a minimum of 4 inches. The upslope end of the mat is secured by burying and staking the ends in a trench and then backfilling the trench. The matting is further secured with wooden stakes spaced every 2.5 feet along the length of the material.

A-3.2 Revegetation Plant Installation

Plant installation should be performed within the wet season if possible (between October and May) unless an irrigation system is available and utilized. Appendix B provides a list of recommended replacement tree species with mature tree heights that are well below obstruction levels.

Plant materials for understory restoration can be supplemented with salvaged material removed during site preparation activities. Purchased plant materials can include both container grown stock and livestake cuttings. Container grown stock should be inspected prior to installation to ensure plants meet the following standards:

- Neither overly loose in the container with underdeveloped root systems, nor container bound
- Free of weeds, disfiguring knots, injuries/abrasions, and all forms of infestation

Trees that are installed in public spaces and ROWs are generally larger planting stock and must meet location jurisdiction requirements (Burien Code Chapter 19.25, Interlocal Agreement Landscape Design Standards, SeaTac Development Standards Chapter 15.445). Within applicable sites in the cities of SeaTac and Burien, these requirements include the following:

- Deciduous trees shall have a caliper of at least 1.75 inches (Burien) or 2 inches (SeaTac).
- Evergreen trees shall be at least 6 feet (Burien) or 8 feet in height (SeaTac).

Additional requirements may include the following:

- Conifer trees should have only one leader (growing apex).
- Deciduous trees that have a solitary leader shall have only lateral branches thinned by pruning.
- Pruning requirements for low branches for accessibility on sidewalks and clear sight distances (branches typically pruned 5 to 8 feet above ground level).

Container plants should be installed according to the following requirements:

- Remove plants from containers in a manner that prevents damage to their root system. Containers may require vertical cuts down the full depth of the container to accommodate

removal. All circling roots shall be loosened to ensure natural directional growth after planting.

- Install plants within pits that are sized at least twice the diameter of the root system or container, with scarified sides and bottom.
- Set plant material in the planting pit to proper grade and alignment. Set plants upright, plumb, and faced to give the best appearance or relationship to each other or adjacent structure. Set the crown of plant material at the finish grade. No filling will be permitted around trunks or stems or above grafts on grafted trees.
- After plants are set, water in soil mixture around bases of root balls and fill all voids.
- Mulch shrub beds immediately after planting. Thoroughly water mulched areas. After watering, rake mulch to provide a uniform finished surface. Mulch shall be feathered back from base of trees and shrubs to reduce potential plant rot.

Livestake cuttings are live plant materials without a previously developed root system. This type of material is often used for willow installations within moist areas; livestake installation is not suitable for non-irrigated, dry soils. The source material for livestakes should be dormant when the cuttings are made and cut from material on a plant that is 1 to 2 years old. Cuttings can only be stored for 2 weeks (kept moist and shaded) before installation. Installation during fall to early spring (October 15 to March 15) is recommended. The top cut for the stake should occur immediately above a bud. The lower root end shall be cut at about a 45-degree angle. Livestake cuttings should be cut and installed with the bark intact, but with no other branches or stems included. Prior to installation, the stakes should be soaked continuously.

Livestake plants should be installed according to the following requirements:

- Pound livestakes into the ground with a mallet or create a hole using a pilot bar in firm soils.
- Plant at least 80% of the stake length within the ground and ensure that two to five bud scars are present above the ground.
- Tamp soil around the stake.
- Mulch the livestake planting area and thoroughly water mulched areas.

A-4 Monitoring

Where black cottonwood or maple stumps remain (steep slopes and wetlands), they should be monitored to ensure resprouting does not lead to future obstructions. Sprouts from stumps can rarely achieve heights above 80 feet, but in certain areas near STIA, these sprouts may still reach obstruction levels. Stumps can be treated using broad-spectrum glyphosate or using fungus (mycilia) tablets that encourage fungus to eat away at the remaining structure.

A-4.1 Performance Monitoring

Long-term monitoring will be required to document potential future obstructions and provide regular maintenance of areas with low-height obstructions. Monitoring will occur for 2 years on all revegetation areas to ensure mitigation measures meet the performance standards below. If monitoring reveals that the revegetation mitigation measures are not meeting the performance standards, corrective action will occur in accordance with SeaTac Municipal Code 15.700.120 as follows:

- **Performance Standard 1:** Average survival of all native planted stock will be 100% at the end of Year 1 and at least 80% at the end of Year 2.
- **Performance Standard 2:** Invasive plant species are maintained at levels below 20% cover averaged over the entire obstruction removal area.

A-4.2 Revegetation As Needed

It is recommended to include a 1-year plant warranty requirement within the contract specifications. This will require the contractor to warrant plant materials to remain alive and be in healthy, vigorous condition for a period of 1 year after the date of physical completion. The warranty will require replacement of plants that are dead or in unhealthy conditions. Typically plant warranties do not include damage or loss of plants caused by fires, floods, freezing rains, lighting, or windstorms; extreme winter weather conditions; vandalism; or negligence on the part of the Owner. Following the 1-year warranty, the Port may conduct revegetation as needed to meet the survival requirements described in the above performance standards.

A-5 Erosion and Sediment Control Best Management Practices

A construction stormwater pollution prevention plan and erosion and sediment control measures will be required to control the quantity and quality of stormwater that may pass through the obstruction management sites. In accordance with Chapter 90.48 Revised Code of Washington and the U.S. Clean Water Act, a Construction Stormwater General Permit (CSWGP) for National Pollutant Discharge Elimination System compliance is anticipated for sites (e.g., WSDOT ROW area) where clearing and grading will exceed 1 acre.

This section outlines the most appropriate best management practices (BMPs) that can be used during obstruction management implementation. More detail on the BMPs identified here is available through the *Stormwater Management Manual for Western Washington* (Ecology 2012).

A-5.1 Preserve Vegetation/Mark Clearing Limits

Natural vegetation and the duff layer/native topsoil outside of the obstruction removal zones should be protected as these materials not only provides long-term ecological function, but also control

stormwater erosion. Clearly marking the limits of clearing will ensure this material is not mistakenly removed during construction activities. Appropriate BMPs for this element include the following:

- BMP C101: Preserving Natural Vegetation
- BMP C102: Buffer Zones
- BMP C103: High Visibility Fence

A-5.2 Establish Construction Access

Constructing a clear construction access and exit location provides safety benefits (e.g., clear understanding of vehicle traffic), and provides an opportunity to control sediment from being tracked outside of the construction site. Appropriate BMPs for this element include the following:

- BMP C105: Stabilized Construction Entrance/Exit
- BMP C107: Construction Road/Parking Area Stabilization

A-5.3 Install Sediment Controls

Earth moving on a construction site increases the risk of sediment being washed "downstream" and, in turn, impacting adjacent sites and/or critical areas such as wetlands or streams. Sediment control measures trap sediment on site where it can be managed. Appropriate BMPs for this element include the following:

- BMP C233: Silt Fence
- BMP C234: Vegetated Strip
- BMP C235: Wattles

A-5.4 Stabilize Soils and Protect Slopes

Soil that has been worked can be protected from erosion and sedimentation by soil stabilization measures. Soils must not remain exposed and unworked for more than 7 days during the dry season (May 1 to September 30), or for more than 2 days during the wet season (October 1 to April 30). Appropriate BMPs for this element include the following:

- BMP C120: Temporary and Permanent Seeding
- BMP C121: Mulching
- BMP C122: Nets and Blankets
- BMP C123: Plastic Covering

A-5.5 Maintain Best Management Practices and Manage the Project

Managing the project will include accounting for the dry and wet seasons as they relate to the construction schedule. During construction, a designated Certified Erosion and Sediment Control Lead person will lead the inspection and monitoring of BMPs and will work with the contractor to

improve BMP performance over the life of the project. Appropriate BMPs for this element include the following:

- BMP C160: Certified Erosion and Sediment Control Lead
- BMP C162: Scheduling

A-6 References

Ecology (Washington State Department of Ecology), 2012. *Stormwater Management Manual for Western Washington*. Publication Number 12-10-030. August.

USDA (U.S. Department of Agriculture), 2016. Danger Tree Mitigation Guidelines for Managers. Cited February 15, 2016. Available from: http://www.fs.fed.us/t-d/pubs/htmlpubs/htm11512815/page05.htm.

Appendix B
Approved Vegetation List

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Common Name	Scientific Name	Maximum Height (feet)	Canopy Width (feet)	Preferred Site Conditions
Moderately Tall Conifer Trees				
Northern Japanese hemlock	*Tsuga diversifolia*	35–60	25	Moist but well-drained soils; shade to part shade (not in sun)
Weeping giant sequoia	*Sequoiadendron giganteum 'Pendulum'*	45–60	4	Sun; well-drained soil
Korean fir	*Abies koreana*	30–50	5	Full sun; well-drained soil; slower growing
Golden Japanese cedar	*Cryptomeria japonica 'Sekkan-sugi'*	25–40	10	Full sun to dappled shade; prefers well-drained soils, but will tolerate clay
Serbian spruce	*Picea omorika*	45–60	10	Grows best in full sun; prefers well-drained soils, but will tolerate clay
Limber pine	*Pinus flexilis 'Vanderwolf's Pyramid'*	25–40	10	Grows best in full sun; prefers well-drained soils; tolerates restricted root zones (good near patios)
Shore pine	*Pinus contorta var. contorta*	40–50	25	Grows best in full sun; prefers well-drained soils; tolerates restricted root zones (good near patios)
Irish yew	*Taxus baccata 'Fastigiata'*	30–50	4	Full sun or shade; prefers well-drained soils; works well as a hedge
Moderately Tall Deciduous Trees				
Trident maple	*Acer buergerianum*	30–50	30	Full sun to open shade in well-drained soil
Japanese maple	*Acer palmatum*	30–40	30	Full sun to open shade; tolerant of many soil conditions
Pagoda dogwood	*Cornus alternifolia*	30–40	30	Prefers light or open shade sites with moist or well-drained soils
Kobus magnolia	*Magnolia kobus*	30–50	15	Easy to grow; plant in sheltered areas to protect flowers
Hybrid white dogwood	*Cornus 'Eddie's White Wonder'*	40–50	20	Prefers rich, well-drained soil, but tolerant of clay; prefers full sun to light shade and good circulation
Sweet bay magnolia	*Magnolia virginiana*	30–40	18	Easy to grow; plant in sheltered areas to protect flowers
Persian ironwood	*Parrotia persica 'Vanessa'*	40–50	20	Grows in full sun to dappled shade; fall color is best in sun; grows best in well-drained soils, but will tolerate moisture and clay
Orangebark stewartia	*Stewartia monadelpha*	50–60	15	Grows best in light to open shade in rich, well-drained or sandy soils; prefers irrigation in summer
Japanese stewartia	*Stewartia pseudocamellia*	50–60	12	Grows best in light to open shade in rich, well-drained or sandy soils; prefers irrigation in summer
Hybrid serviceberry	*Amelanchier × grandiflora 'Autumn Brilliance'*	30–40	25	Prefers full sun, but tolerates light shade; prefers well-drained soils, but tolerates clay
Goldenrain tree	*Koelreuteria paniculata*	30–40	25	Prefers full sun and well-drained soils, but tolerant of clay
Black gum	*Nyssa sylvatica*	50–60	20	Prefers full sun to light or open shade; adaptable to many soil conditions from wet to well-drained