September 2026

Everett Link Extension

Draft Environmental Impact Statement

WATER RESOURCES TECHNICAL REPORT

Appendix G.9

SOUNDTRANSIT

U.S. Department of Transportation
Federal Transit Administration

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Acronyms

AIR	SR 99/Airport Road
ALD	West Alderwood
ASH	Ash Way
BI	Broadway/I-5
BMP	best management practices
CARA	Critical Aquifer Recharge Area
CESCL	Certified Erosion and Sediment Control Lead
CSWGP	Construction Stormwater General Permit
Corps	United States Army Corps of Engineers
DCIA	Directly Connected Impervious Area
DIA	Disconnected Impervious Area
Ecology	Washington State Department of Ecology
EGN	SR 526/Evergreen
EIS	Environmental Impact Statement
EMC	Everett Municipal Code
EPA	United States Environmental Protection Agency
EVLE	Everett Link Extension
EVT	Everett Station
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
HPA	Hydraulic Project Approval
HUC	Hydrologic Unit Code
I	Interstate
LID	Low-Impact Development
LMC	Lynnwood Municipal Code
MAR	Mariner
NEPA	National Environmental Policy Act

NPGIS	Non-Pollution-Generating Impervious Surface
NRCS	Natural Resource Conservation Service
OHWM	Ordinary High-Water Mark
OMF	operations and maintenance facility
PDS	Snohomish County Planning & Development Services
PGIS	Pollution-Generating Impervious Surface
RCW	Revised Code of Washington
SCC	Snohomish County Code
SFHA	Special Flood Hazard Area
SR	State Route
ST3	Sound Transit 3
SWI	SW Everett Industrial Center
SWPPP	Stormwater Pollution Prevention Plan
USC	United States Code
USGS	United States Geological Survey
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WPZ	Wellhead Protection Zones
WRIA	Water Resource Inventory Area
WSDH	Washington State Department of Health
WSDOT	Washington State Department of Transportation

1 INTRODUCTION

1.1 Overview

The Central Puget Sound Regional Transit Authority (Sound Transit) is proposing to expand Link light rail transit service northward from the Lynnwood City Center Station to the Everett Station area in Snohomish County, Washington (Figure 1-1). The Everett Link Extension (EVLE) Project would provide fast, reliable light rail service to regional residential and job centers in Snohomish County's growing urban areas. The proposed project is part of the Sound Transit 3 (ST3) Plan of regional transit system investments, funding for which was approved by voters in the region in 2016.

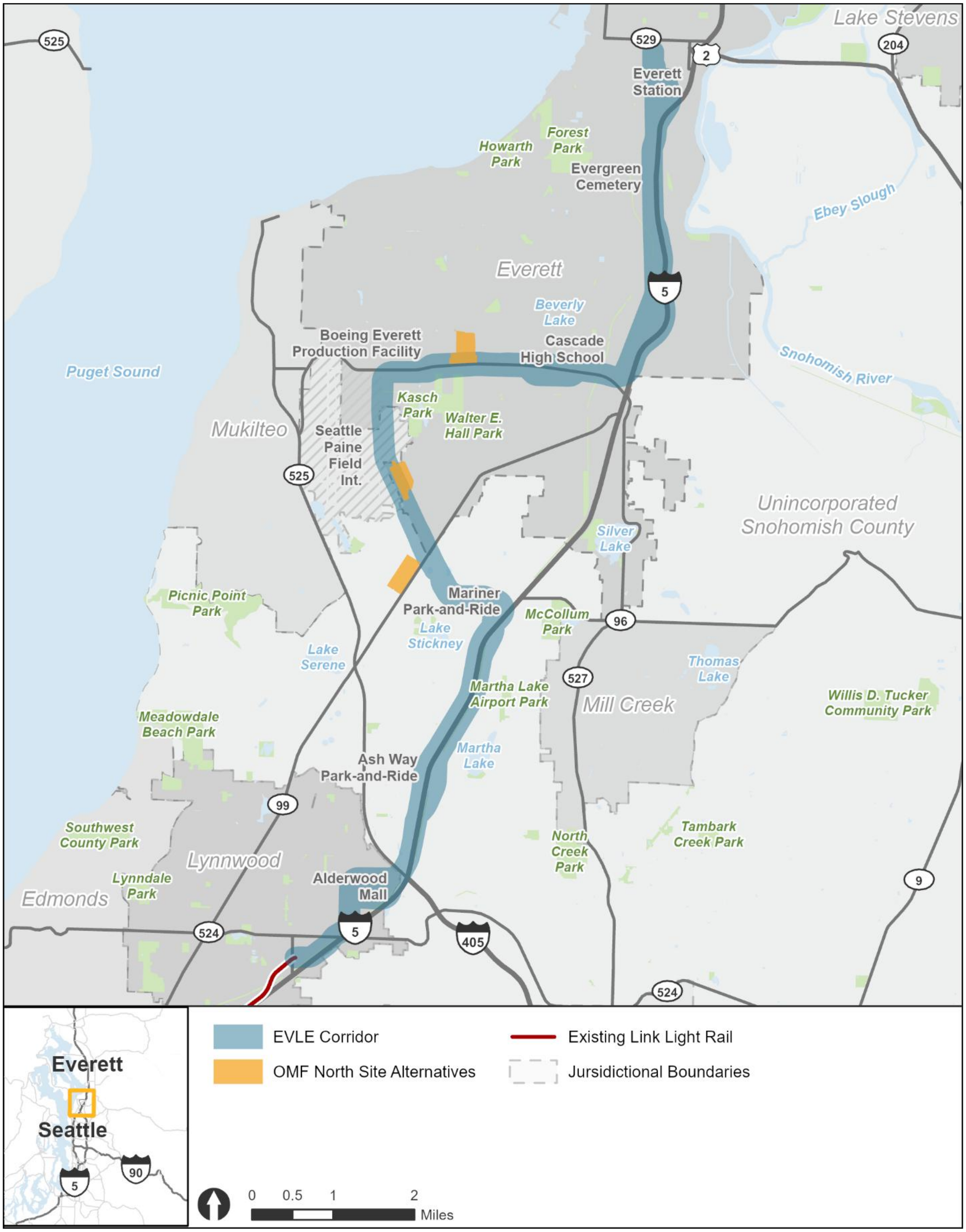
For this analysis, the EVLE Project consists of approximately 16 miles of light rail guideway, seven light rail stations, two parking facilities, and an operations and maintenance facility (OMF North). Sound Transit proposes to begin construction of the project in 2030. The current schedule for opening light rail service from the Lynnwood City Center Station to Everett Station is 2041. A shorter route connecting Lynnwood City Center to the SW Everett Industrial Center Station would open first in 2037 as the initial phase. OMF North would open by 2034, prior to opening of the light rail extension, as the facility is necessary for storing rail cars and supporting service for not only the extension to Everett, but also other parts of the regional system.[1] Parking facilities at the Mariner and Everett Stations would open by 2046.

One station, State Route (SR) 99/Airport Road Station, is currently considered provisional since planning, preliminary engineering, and environmental review are funded, but final design and construction are not. However, for purposes of this evaluation, all seven stations are assumed to be funded and open according to the schedule described above to capture all locations where impacts could occur. The station would be fully constructed and open for service when additional funding is identified.

The initial phase is not discussed in this analysis because it would not have additional potential impacts when compared with the fully built alternatives (i.e., the impacts would be the same in the West Alderwood, Ash Way, Mariner, SR 99/Airport Road, and SW Everett Industrial Center Segments, and for the OMF sites, but the impacts in the SR 526/Evergreen, Broadway/I-5, and Everett Station Segments would not occur until construction on those segments begins). All potential impacts are described in Section 4.

[1] Construction of light rail projects is typically divided into sections, and construction would occur across different parts of the corridor between 2030 and 2046. For more information on the construction approach, see Draft EIS Appendix B.

Figure 1-1 EVLE Project Corridor



For planning and engineering purposes, the project is organized into eight geographic segments, discussed in this document from south to north. Within those segments, a total of 17 alignment alternatives and 18 station location alternatives are under consideration. These alignment and station alternatives are combined into Build Alternatives for analysis as shown in Table 1-1 and Figure 1-2.

Table 1-1 describes the alignment and station alternatives as follows:

- **Segments:** The eight alignment segments and corresponding abbreviations are:
  - West Alderwood (ALD).
  - Ash Way (ASH).
  - Mariner (MAR).
  - SR 99/Airport Road (AIR).
  - SW Everett Industrial Center (SWI).
  - SR 526/Evergreen (EGN).
  - Broadway/I-5 (BI).
  - Everett Station (EVT).
- **Alignment alternatives:** Alignment alternatives in each segment are identified with numbers (e.g., ALD-1).
- **Station alternatives:** Station alternatives in each segment are identified with letters (e.g., ALD-B).[2]
- **Build Alternatives:** Alignments and stations are combined to create the Build Alternative name (e.g., Station ALD-B is located on Alignment ALD-1, so this pairing is referred to as Alternative ALD-1B). If a preferred Build Alternative has been identified by the Sound Transit Board of Directors, it is indicated with an asterisk.
- **Design options:** A design option is an alternate design for a portion of a Build Alternative. It could be a different route or profile along a portion of an alignment, a different station configuration, or a different parking location. For example, in the West Alderwood Segment, the Alderwood Mall Boulevard Design Option is being considered for all three Build Alternatives.

[2] Letters identifying station alternatives are non-sequential in some segments; missing letters denote alternatives that did not perform as well as alternatives considered in the Draft EIS. For more information on the Alternatives Development process, see Draft EIS Chapter 2.

Table 1-1 Alignment and Station Build Alternatives by Segment

Segment	Alignment Alternatives	Station Alternatives	Build Alternatives (Combined Alignment and Station)	Build Alternative Design Options Also Considered
West Alderwood	ALD-1	ALD-B	ALD-1B	Alderwood Mall Boulevard
	ALD-2	ALD-D	ALD-2D*	Alderwood Mall Boulevard
		ALD-F	ALD-2F	Alderwood Mall Boulevard
Ash Way	ASH-1	ASH-A	ASH-1A	None
	ASH-2	ASH-D	ASH-2D	None
Mariner	MAR-1	MAR-B	MAR-1B	Surface Parking
	MAR-2	MAR-D	MAR-2D	Surface Parking
SR 99/ Airport Road	AIR-1	AIR-A	AIR-1A	None
	AIR-2	AIR-B	AIR-2B	None
SW Everett Industrial Center	SWI-1	SWI-A	SWI-1A*	Lower
		SWI-B	SWI-1B	None
		SWI-C	SWI-1C	None
SR 526/ Evergreen	EGN-1	EGN-A	EGN-1A	None
	EGN-2	EGN-B	EGN-2B	North Side of SR 526
	EGN-3	EGN-E	EGN-3E	North Side of SR 526
Broadway/I-5	BI-1	None	BI-1*	None
	BI-2	None	BI-2	None
Everett Station	EVT-1	EVT-A	EVT-1A	None
	EVT-2	EVT-C	EVT-2C*	None
	EVT-3	EVT-D	EVT-3D*	None

* Denotes preferred alternative

There are also three OMF North site alternatives under consideration as shown in Table 1-2 and Figure 1-2.

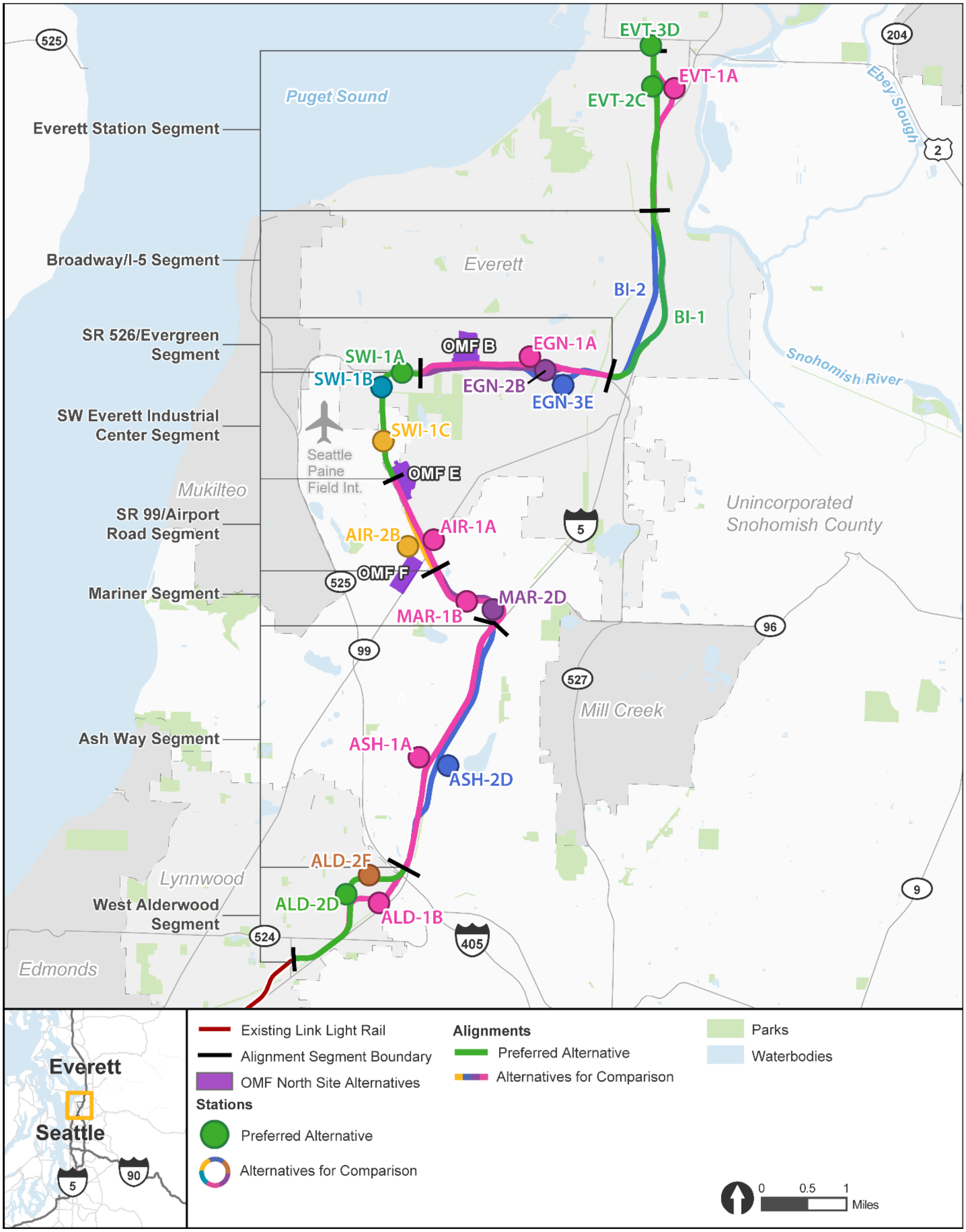
Table 1-2 OMF North Site Alternatives

Build Alternative	Build Alternative Design Options Also Considered
OMF Site F	Lead Tracks to West Side of Airport Road
OMF Site E	None
OMF Site B	Lead Tracks to South Side of SR 526

Analysis of the Build Alternatives was based on the conceptual design drawings included in Draft Environmental Impact Statement (EIS) Appendix F.

The No Build Alternative describes the environment, including the transportation system, as it would exist in 2046 without the proposed project. The No Build Alternative uses 2046 as the year of analysis to align with the target date for completion of all EVLE Project components and the full buildout of the light rail capital projects included in the ST3 Plan.

Figure 1-2 EVLE Project Alternatives



1.2 Potential Design Refinements

In addition to the alternatives described above, the Draft EIS provides a qualitative evaluation of potential design refinements that could reduce overall project cost if applied to the alignment and station alternatives (for more information, see Draft EIS Chapter 2). The potential design refinements identified to date that could be considered in each segment, along with potential changes in impacts, are described in Draft EIS Chapter 4. Potential changes in impacts to water resources are also described in Section 4.1.1.4. If Sound Transit decides to include these refinements as part of the project prior to the Final EIS, they would be reflected in the conceptual design plans and evaluated in the Final EIS.

1.3 Purpose of Report

The purpose of this report is to discuss the potential impacts the EVLE Project alternatives could have on water resources within the study area. Water resources include surface water (e.g., streams, rivers, lakes, and ponds), shorelines, floodplains and floodways, groundwater, and stormwater utilities. Wetlands are water resources in that they are part of the hydrologic system and cycle. However, they are only mentioned in this report in instances where groundwater discharge is associated with them within the study area. Otherwise, wetlands and potential project impacts to those resources are addressed within the Ecosystems Technical Report in Draft EIS Appendix G.10. Similarly, stream habitat conditions and associated project impacts are also addressed in the Ecosystems Technical Report.

Where water resources exist within the study area, two overall types of impacts could occur:

- **Operational impacts:** impacts that are typically longer in duration and result from the operation of the project. Examples include permanent structures, paving, and transit operations.
- **Construction impacts:** impacts that are typically shorter in duration and only occur during construction phases. For example, stormwater discharges and elevated noise during construction.

This report also discusses measures intended to avoid and minimize impacts, and potential compensation for impacts.

2 REGULATORY CONTEXT AND METHODOLOGY

2.1 Applicable Laws, Regulations, and Guidelines

Federal, state, and local regulations that govern the protection or use of water resources, hydrology, and flooding issues relevant to the EVLE Project are listed below. Local ordinances that guide the use of water resources in the study area are also included.

2.1.1 Federal

- Sections 404, 402, and 401 of the Clean Water Act (CWA).
- Coastal Zone Management Act.

- Section 7 of the Endangered Species Act (ESA).
- Floodplain Management Presidential Executive Order 11988.
- Safe Drinking Water Act, 42 USC 300 et seq., Chapter 6A.

2.1.2 State

- Construction Stormwater General Permit (Washington State Department of Ecology [Ecology] 2020).
- Washington State Water Quality Standards for Surface Waters, Washington Administrative Code (WAC) 173-201A.
  - Under WAC 173-201A, the State has assigned water uses to each of the waterbodies in the study area. Water uses define the Ecology water quality standards that must be met for each waterbody and that are enforced by Ecology.
- Washington State Water Quality Standards for Groundwater, WAC 173-200.
- Washington State Flood Control Management Act, Revised Code of Washington (RCW) 89.
- Washington State Water Pollution Control Act, RCW 90.48.
- Washington State Shoreline Management Act, RCW 90.58, WAC 173-26.
- Ecology National Pollution Discharge Elimination System.
- Washington State Hydraulic Code (WAC 220-660).
- *Washington State Department of Transportation (WSDOT) Highway Runoff Manual* (WSDOT 2019).
- *WSDOT Hydraulics Manual* (WSDOT 2024).
- *Ecology Stormwater Management Manual for Western Washington* (Ecology 2019).

The light rail track/guideway is considered Non-Pollution-Generating Impervious Surface (NPGIS) under Ecology's 2019 municipal stormwater permit and manual and Pollution Generating Impervious Surface (PGIS) under the 2024 permit and manual. However, the 2024 permit and manual are subject to a pending appeal before the Pollution Control Hearings Board. Therefore, this document assesses the guideway as NPGIS.

2.1.3 Regional

- Technical Resources:
  - *Sound Transit Requirements Manual* (Sound Transit 2023).
  - *Low Impact Development Technical Guidance Manual for Puget Sound* (Puget Sound Partnership 2012).

2.1.4 Local

- Snohomish County Shoreline Management, Snohomish County Code (SCC) 30.44.
- Snohomish County Critical Areas Regulations, SCCs 30.62, 30.62A, 30.62B, and 30.62C.

- Snohomish County Drainage, SCC 30.63A.
- Snohomish County Land Disturbing Activity, SCC 30.63B.
- Snohomish County Low Impact Development, SCC 30.63C.
- Snohomish County Groundwater Protection, SCC 30.64.
- Snohomish County Special Flood Hazard Areas, SCC 30.65.
- SCC, Title 25, Storm and Surface Water Management.
- SCC, Title 36B, Land Disturbing Activities.
- SCC, Shoreline Management Program, Chapter 30.67.
- *Swamp Creek Urban Growth Area Drainage Needs Report, Including Scriber Creek Subbasin* (Snohomish County 2002).
- City of Lynnwood Stormwater Management, Lynnwood Municipal Code 13.40.
- City of Lynnwood Surface Water Quality, Lynnwood Municipal Code 13.45.
- City of Lynnwood Flood Hazard Area Regulations, Lynnwood Municipal Code 16.46.
- City of Lynnwood Environmentally Critical Areas, Lynnwood Municipal Code 17.10.
- City of Lynnwood Shoreline Master Program, Lynnwood Municipal Code 17.20.
- City of Everett Surface and Storm Drainage, Everett Municipal Code 14.28.
- City of Everett Flood Damage Prevention, Everett Municipal Code 19.30.
- City of Everett Critical Areas, Everett Municipal Code 19.37.
- City of Everett Transportation Mitigation, Everett Municipal Code 19.51.
- *City of Everett North Creek Stormwater Management Action Plan* (City of Everett 2023c).
- City of Everett Shoreline Master Program (City of Everett 2019).
- Technical Resources:
  - *Snohomish County Drainage Manual* (Snohomish County 2021).
  - *City of Everett Surface Water Comprehensive Plan* (City of Everett 2022b).
  - City of Everett Stormwater Technical Resources (City of Everett 2023d).
  - City of Everett Design and Construction Standards for Development (Everett 2023a).

2.2 Methodology

National Environmental Policy Act (NEPA) regulations require that an EIS disclose impacts (i.e., effects) of a proposed action on the environment. NEPA requires an EIS to evaluate and disclose the "reasonably foreseeable environmental effects of the proposed agency action" (42 USC Section 4332). Reasonably foreseeable environmental effects are those that are sufficiently likely to occur during operation (long-term) or construction (short-term). Reasonably foreseeable environmental effects do not include effects that are speculative in nature or remote in time or place, or that are the result of a lengthy causal chain. For this analysis, reasonably foreseeable effects include all effects that are considered likely to result from the project over its operational lifetime within the study area of each resource.

The methods used to guide the collection of water resources data within the study area are outlined below. The project limits include permanent project improvements and areas needed for project construction.

2.2.1 Study Area

The study area for this report is defined as:

- Identified drainage basins where surface water drains to/from, or across, the project limits.
- 100 feet upstream and 300 feet downstream of each water body crossing within the project limits. The survey extended to 300 feet upstream if channel configuration results in stream buffers overlapping the project limits.
- Identified surface water features that are within 200 feet of the project limits.

2.2.2 Review of Existing Map Data and Documentation

A preliminary desktop review of the following sources was performed to identify existing conditions as described in Section 3:

- City of Everett Geographic Information Systems (GIS) data (City of Everett 2023b).
- City of Everett Streams, Wetlands, & Recharge Sites, Critical Areas Map 1 (City of Everett 2022a).
- *City of Everett Surface Water Comprehensive Plan* (City of Everett 2022b).
- City of Everett Municipal Code (City of Everett 2024).
- City of Lynnwood GIS data (City of Lynnwood 2024b).
- City of Lynnwood Environmentally Critical Areas Inventory, Streams Map (City of Lynnwood 2016).
- Northwest Indian Fisheries Commission (NWIFC) Statewide Integrated Fish Distribution (NWIFC 2025).
- Snohomish County Planning & Development Services GIS data (Snohomish County 2024b).
- Washington State Department of Health (WSDH) Critical Aquifer Recharge online GIS data (WSDH 2024).
- WDFW Priority Habitats and Species (WDFW 2023a).
- Washington Department of Fish and Wildlife (WDFW) Statewide Integrated Fish Distribution (WDFW 2023b).
- WDFW Fish Passage (WDFW 2023c).
- WSDOT Fish Passage (WSDOT 2024).
- Ecology, 303(d) Impaired Waterbodies (Ecology 2024a).

- National Resource Conservation Service (NRCS) Web Soil Survey online GIS data (NRCS 2023).
- Federal Emergency Management Agency (FEMA) floodplain and floodway maps (FEMA 2024).

2.2.3 Surface Water

2.2.3.1 Methods

Surface water features, as defined by this study, include streams, lakes, ponds, marine areas, and Shorelines of the State. This evaluation assessed impacts to water resources in terms of changes to water quality, water quantity, and flows when considering changes to land uses, drainage patterns, and stormwater management that would be required for the project. Surface waters were evaluated through a review of publicly available resources, field surveys, and coordination with Tribes and federal, state, and local regulatory agencies. If a stream had been given a formal name within local or state surface water documentation reviewed as part of this evaluation, that name was used. Unnamed streams were named for purposes of this analysis, using the following convention: the letter “S” and the next two letters will be based on the jurisdiction they are located in (Lynnwood = LY, Everett = EV, Snohomish County = SC), followed by the order they are encountered in the field (1, 2, 3, etc.). For example, Stream SEV2 would be the second field-identified stream located in Everett.

Site Reconnaissance

During site reconnaissance, surface water features within the study area were identified, mapped, and described within public right-of-way and parcels where rights-of-entry had been obtained. Descriptions of these surface water features can be found in the Ecosystems Technical Report in Draft EIS Appendix G.10. Sound Transit’s Stream Habitat Assessment Guidelines were used to determine the level of information that should be collected for each identified stream.

Streams and other surface water features outside of public right-of-way on properties lacking access were identified based on field observation from public areas; current local, state, and federal habitat maps and reports; and the examination of aerial photographs. Inaccessible areas outside of public right-of-way that appeared to be aquatic habitats were included to provide a conservative estimate of the potential impacts for each alternative. Where right-of-entry was not obtained, surface water features were identified and mapped based on off-site field observation of waterways and waterbodies (from accessible areas during the site reconnaissance). Surface water features that could not be directly observed from public right-of-way or properties without right-of-entry were evaluated based on existing data and aerial photographs.

Mapping

Field data was collected using field data sheets and project limits of the conceptual design. Data was digitized using ESRI’s ArcGIS Pro, added to a geodatabase, and added to the figures included in this report.

2.2.4 Stormwater

2.2.4.1 Methods

Stormwater infrastructure includes stormwater management facilities (e.g., stormwater ponds), drainage infrastructure (e.g., culverts), and surface water discharge points. Stormwater infrastructure within the study area was identified through a desktop review of publicly available spatial data, 3D surfaces, aerial photographs, Google Street View, and a limited site reconnaissance from public rights-of-way.

Mapping

Existing spatial data containing stormwater conveyance features and detention and retention pond features from the City of Lynnwood, City of Everett, and Snohomish County were reviewed. NPGIS and PGIS are not mapped in publicly available data and were instead identified for this analysis based on descriptions from Ecology's *Stormwater Management Manual for Western Washington* (Ecology 2019) and Snohomish County's *Drainage Manual* (Snohomish County 2021). Unmapped features were then manually delineated in ArcGIS Pro using aerial imagery and existing data and subsequently incorporated into the GIS geodatabase.

2.2.5 Shorelines

2.2.5.1 Methods

Those surface water features which are considered Shorelines of the State and subject to the state's Shoreline Management Act are defined within RCW 90.58 (RCW 2025). Those surface water features considered Shorelines of the State are summarized as follows:

- All marine waters along the Pacific Ocean and Puget Sound.
- Streams and rivers with greater than 20 cubic feet per second mean annual flow.
- Lakes 20 acres or larger.

Shorelands adjacent to these water bodies are also subject to the Shoreline Management Act, and include:

- Lands extending landward for 200 feet in all directions as measured on a horizontal plane from the ordinary high water mark.
- Floodways and contiguous floodplain areas landward 200 feet from such floodways.
- All wetlands and river deltas associated with the streams, lakes, and tidal waters which are subject to the provisions of RCW 90.58.

Spatial data of the Shorelines of the State, developed by Ecology, were evaluated for the presence of shorelines subject to the state's shoreline master program within the study area (City of Lynnwood 2018; City of Everett 2023b; Snohomish County 2024a; Ecology 2025).

Mapping

No regulated Shorelines of the State or associated shorelands were identified in the study area.

2.2.6 Floodplains and Floodways

2.2.6.1 Methods

Floodways and floodplains are regulated features that need to be considered if a project would potentially impact flood functions and elevations. Floodways are the part of the floodplain that carry most of the water during a flood and must not be developed to avoid increases in upstream flood elevations. FEMA-regulated floodplains are defined as the area that will be inundated by the flood event having a 1% chance of being equaled or exceeded in any given year (FEMA 2020). Floodways and floodplains are considered Special Flood Hazard Areas (SFHAs) by FEMA and are regulated by local jurisdictions as flood hazard areas.

Floodways and floodplains are identified collectively as SFHAs on the FEMA Flood Insurance Rate Maps and include:

- **Zone A**: The base floodplain where base flood elevations are not provided.
- **Zone AE**: The base floodplain where base flood elevations are provided.
- **Zone VE**: Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves.

Mapping

Floodways and floodplains were identified through a desktop review of publicly available FEMA Flood Insurance Rate Maps as well as online floodplain inventory data from the City of Lynnwood, Snohomish County (Snohomish County 2023a), and City of Everett. Zone VE areas in the vicinity of the study area were added to project maps for reference. No new mapping of features was performed.

2.2.7 Groundwater

2.2.7.1 Methods

Critical Aquifer Recharge Areas (CARAs), Wellhead Protection Zones (WPZs), and areas where aquifers are sensitive to contamination in the study area were identified through a review of publicly available resources (spatial data) and field surveys (WSDH 2024). Wellhead Protection Zone can be used interchangeably with wellhead protection area.

CARAs are defined as including United States Environmental Protection Agency (EPA)-designated sole source aquifers, Group A WPZs, and areas sensitive to groundwater contamination (Snohomish County 2016; City of Lynnwood 2024a). The EPA defines a sole-source aquifer as the primary source for drinking water for a given area. WPZs are areas within the modeled 10-year time-of-travel wellhead protection area of a public well (WSDH 2017). The United States Geological Survey (USGS) classifies relative sensitivity to groundwater contamination for aquifers in Snohomish County. Maps of groundwater aquifer sensitivity, ranked low to high, were used for this analysis and are available via the Snohomish County Planning & Development Services (PDS) Map Portal (Snohomish County 2024b).

Site Reconnaissance

Groundwater seepage (i.e., groundwater flowing from subsurface to surface) was documented where observed during the site reconnaissance. Unmapped wells were looked for during site reconnaissance. Existing wells were not visually evaluated or inspected.

Mapping

The EPA's Interactive Map of Sole Source Aquifers was reviewed. No new mapping was performed.

3 AFFECTED ENVIRONMENT

The project spans approximately 16 miles and is located within parts of Lynnwood, Everett, and unincorporated Snohomish County, Washington. The project is located within Water Resource Inventory Area (WRIA) 7, Snohomish watershed, and WRIA 8, Cedar-Sammamish watershed. A detailed description of the drainage basins within the study area is included in the Ecosystems Technical Report in Draft EIS Appendix G.10.

This section documents the existing water resources (the affected environment) within the study area.

3.1 Surface Water

3.1.1 Drainage Basins

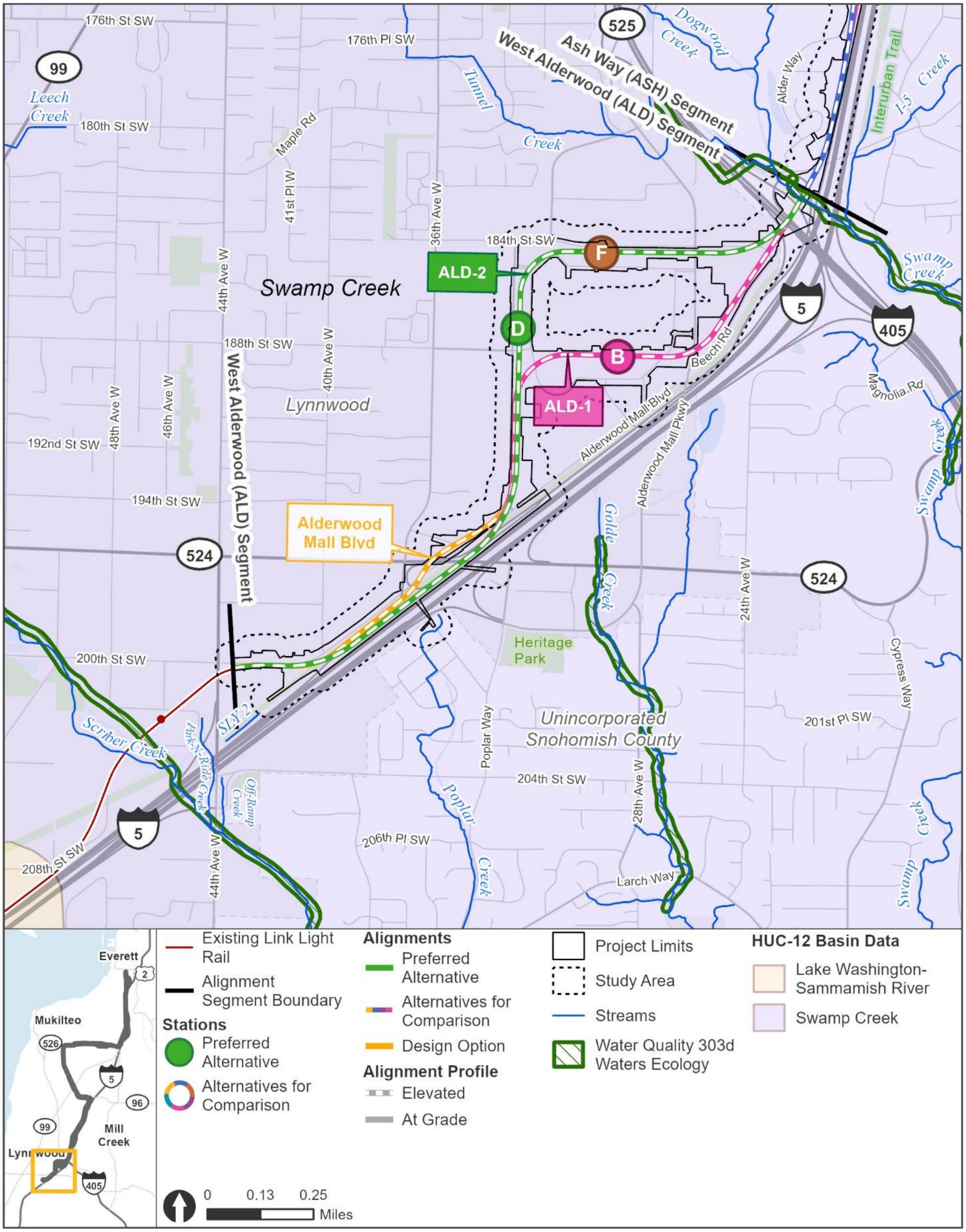
A drainage basin, as defined by the USGS, is an area of land that drains surface waters to a common outlet, such as a stream, and into a different waterbody (USGS 2019). The drainage basins identified in Figure 3-1 through Figure 3-12 are included in the affected environment because local water resources could be impacted by the construction and operation of the Build Alternatives. This assessment focused on water resources that would likely experience changes in flow or direct runoff from the project during construction and/or long-term operations of the project. For detailed descriptions of the basins within the study area, refer to the Ecosystems Technical Report in Draft EIS Appendix G.10.

The study area occurs within four Hydrologic Unit Code 12 (HUC-12) basins across the Cedar-Sammamish watershed (WRIA 8) and the Snohomish watershed (WRIA 7). According to the USGS, "Watersheds are delineated by USGS using a nationwide system based on surface hydrologic features. This system divides the country into 22 regions (2-digit); 245 subregions (4-digit); 405 basins (6-digit); approximately 2,400 subbasins (8-digit); approximately 19,000 watersheds (10-digit); and approximately 105,000 subwatersheds (12-digit). A hierarchical HUC consisting of two additional digits for each level in the hydrologic unit system is used to identify any hydrologic area" (USGS 2024). The phrase "drainage basins" can be used interchangeably with the word "watersheds", which are categorized by the USGS using a hierarchical classification system created by USGS for delineated drainage basins. The drainage basins present within the study area are as follows:

- Cedar-Sammamish watershed (WRIA 8).
- Swamp Creek – HUC 171100120303.

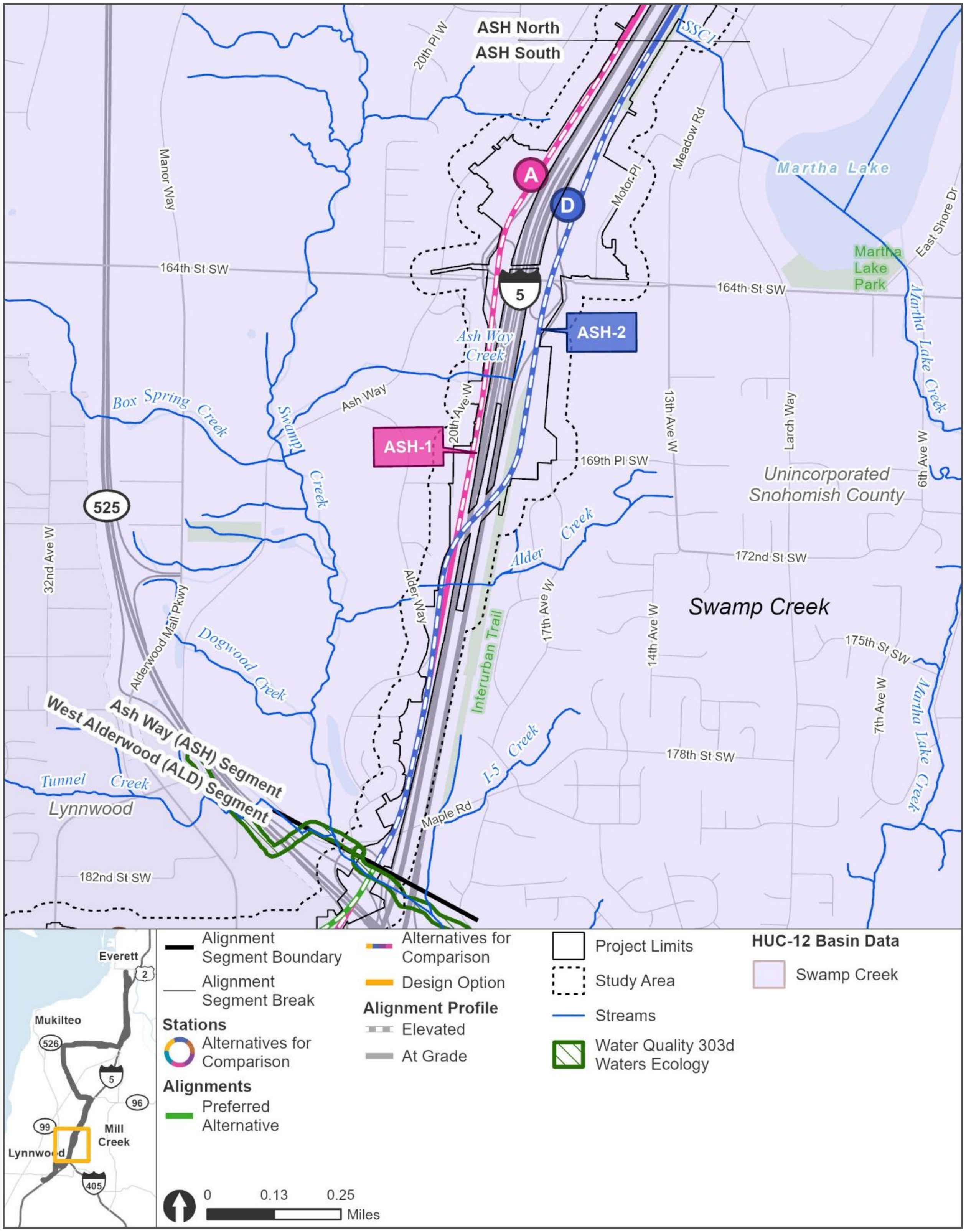
- North Creek – HUC 171100120302.
- Snohomish watershed (WRIA 7).
- Powder Mill Gulch – Frontal Possession Sound (HUC 171100190202), also known as Port Gardener Bay watershed.
  - Japanese Gulch subbasin.
  - Powder Mill Gulch subbasin.
  - Narbeck Creek subbasin.
  - Merrill & Ring Creek subbasin.
  - Pigeon Creek No. 2 subbasin.
- Snohomish River – Frontal Possession Sound (HUC 171100110203).
  - Wood Creek subbasin.
  - Lowell subbasin.
  - Riverfront subbasin.
  - Combined Sewer Basins.

Figure 3-1 Drainage Basins – West Alderwood Segment



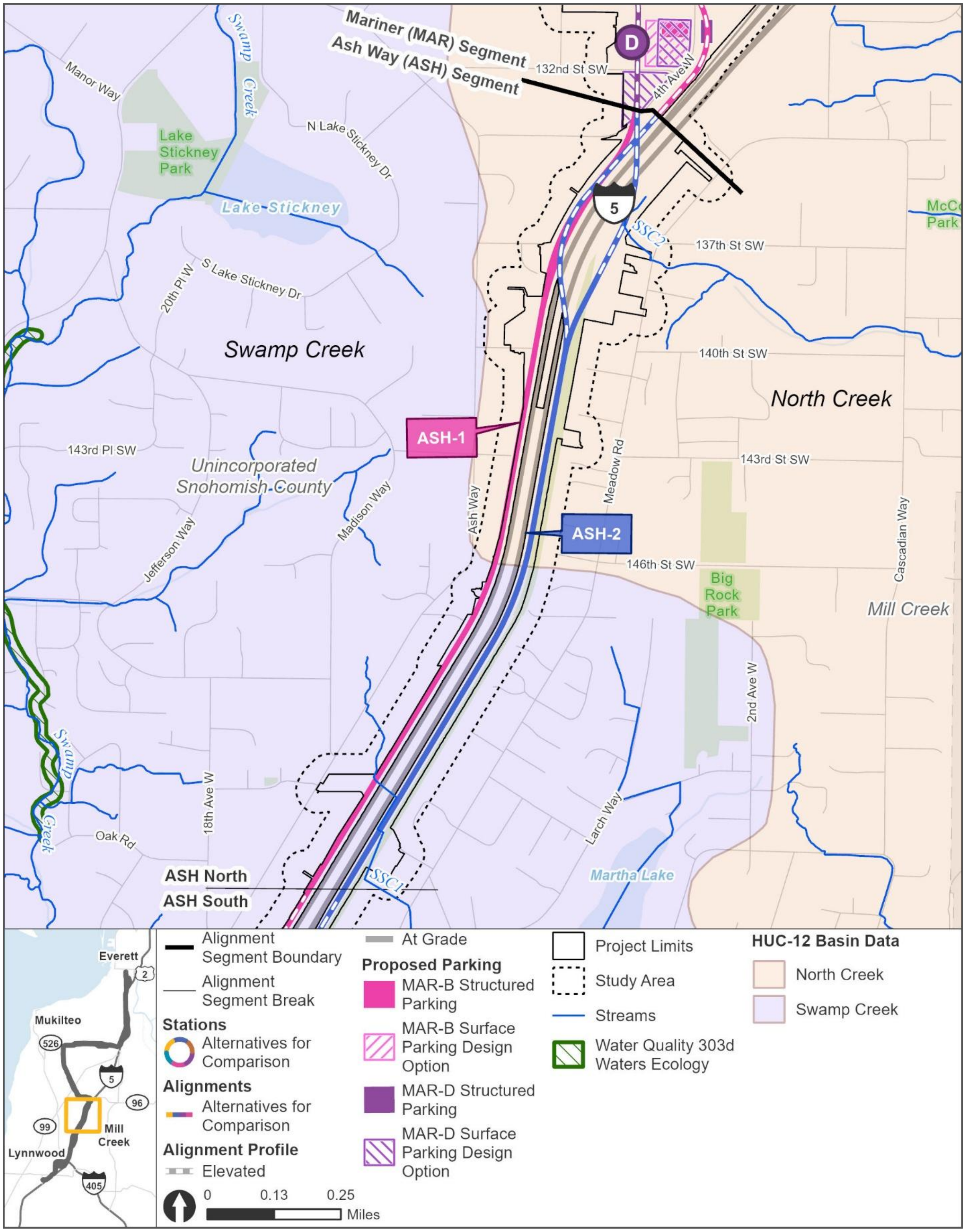
SOURCE: USGS (2023).

Figure 3-2 Drainage Basins – Ash Way Segment (South)



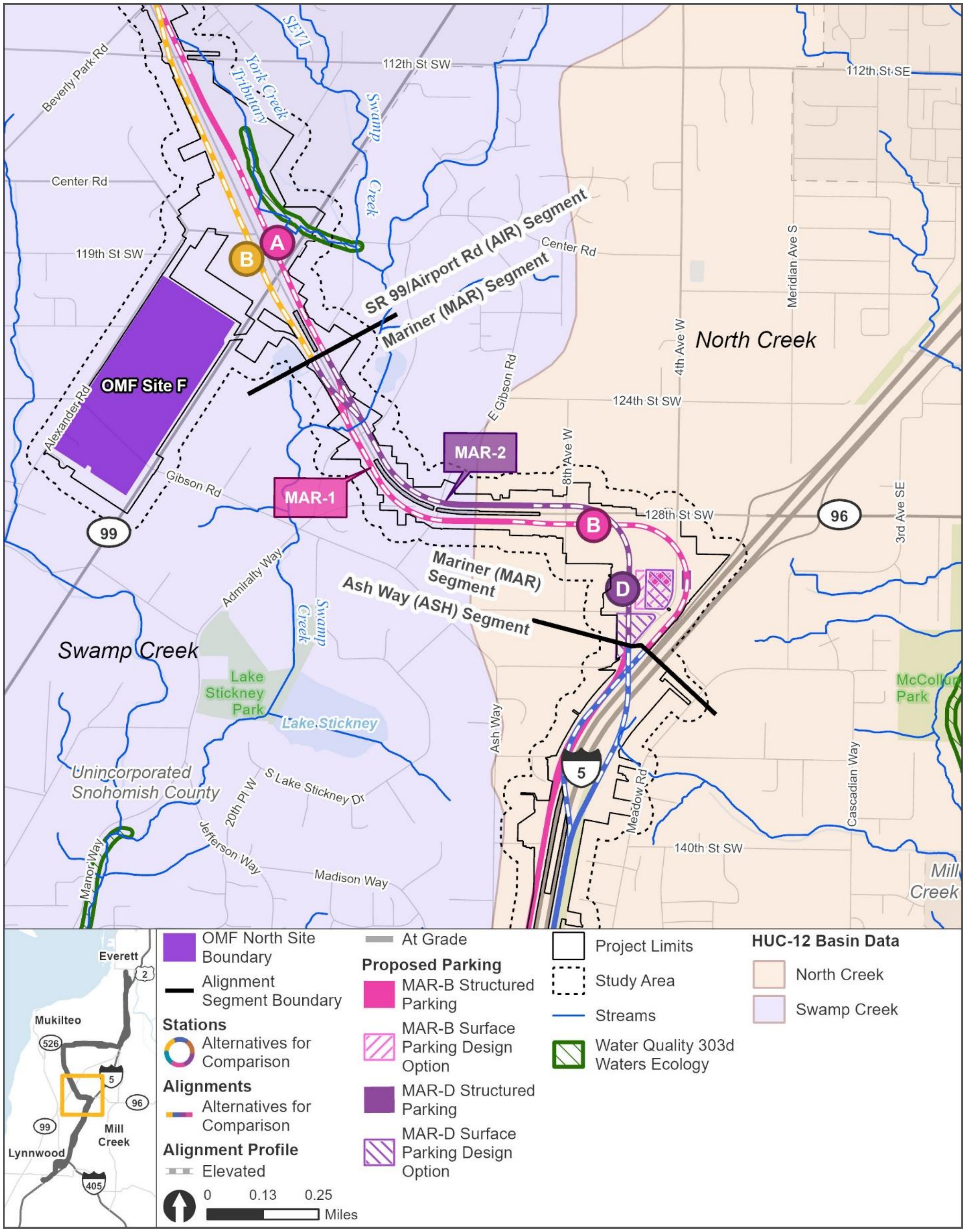
SOURCE: USGS (2023) and Ecology (2024a).

Figure 3-3 Drainage Basins – Ash Way Segment (North)



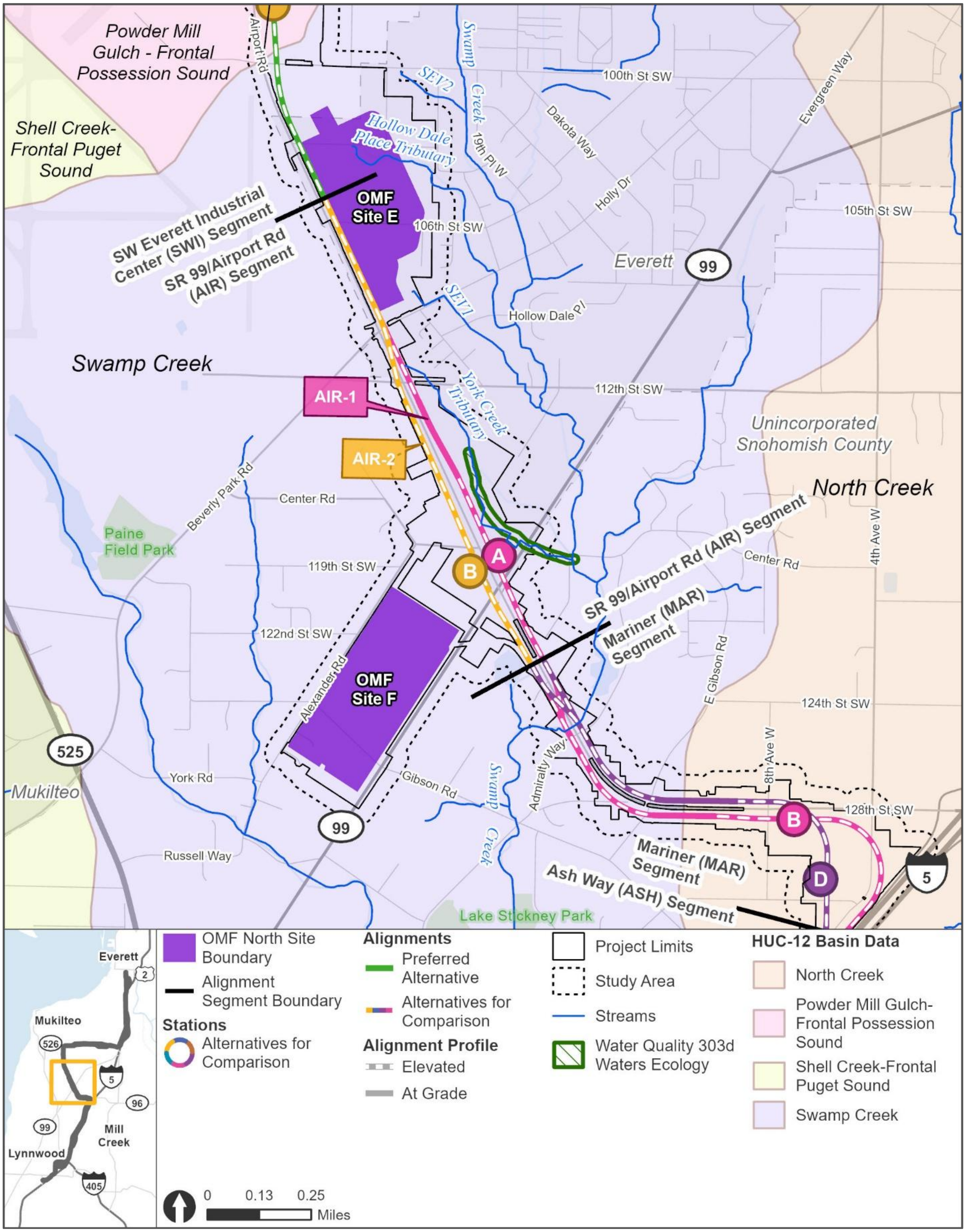
SOURCE: USGS (2023) and Ecology (2024a).

Figure 3-4 Drainage Basins – Mariner Segment



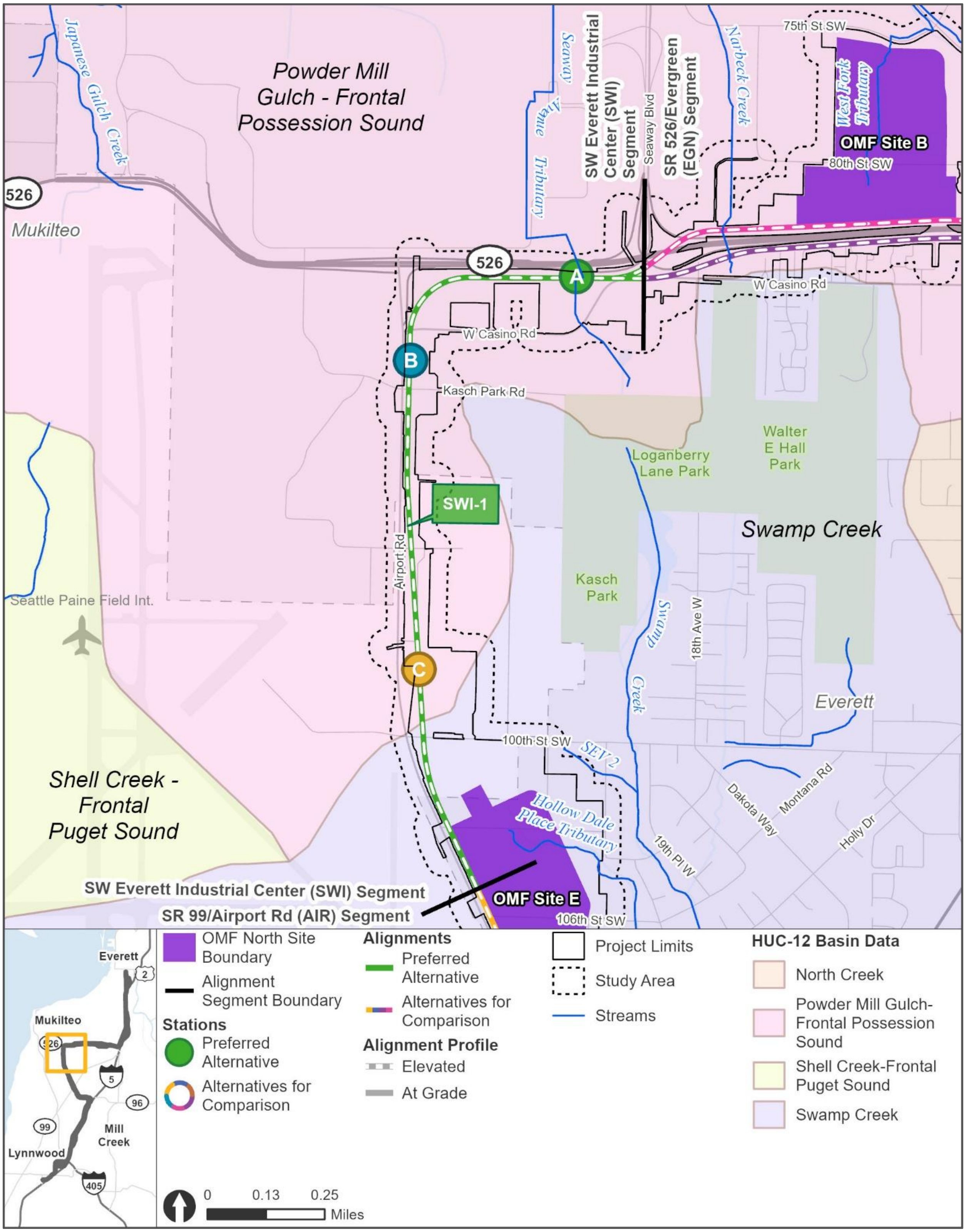
SOURCE: USGS (2023) and Ecology (2024a).

Figure 3-5 Drainage Basins – SR 99/Airport Road Segment and OMF Sites F and E



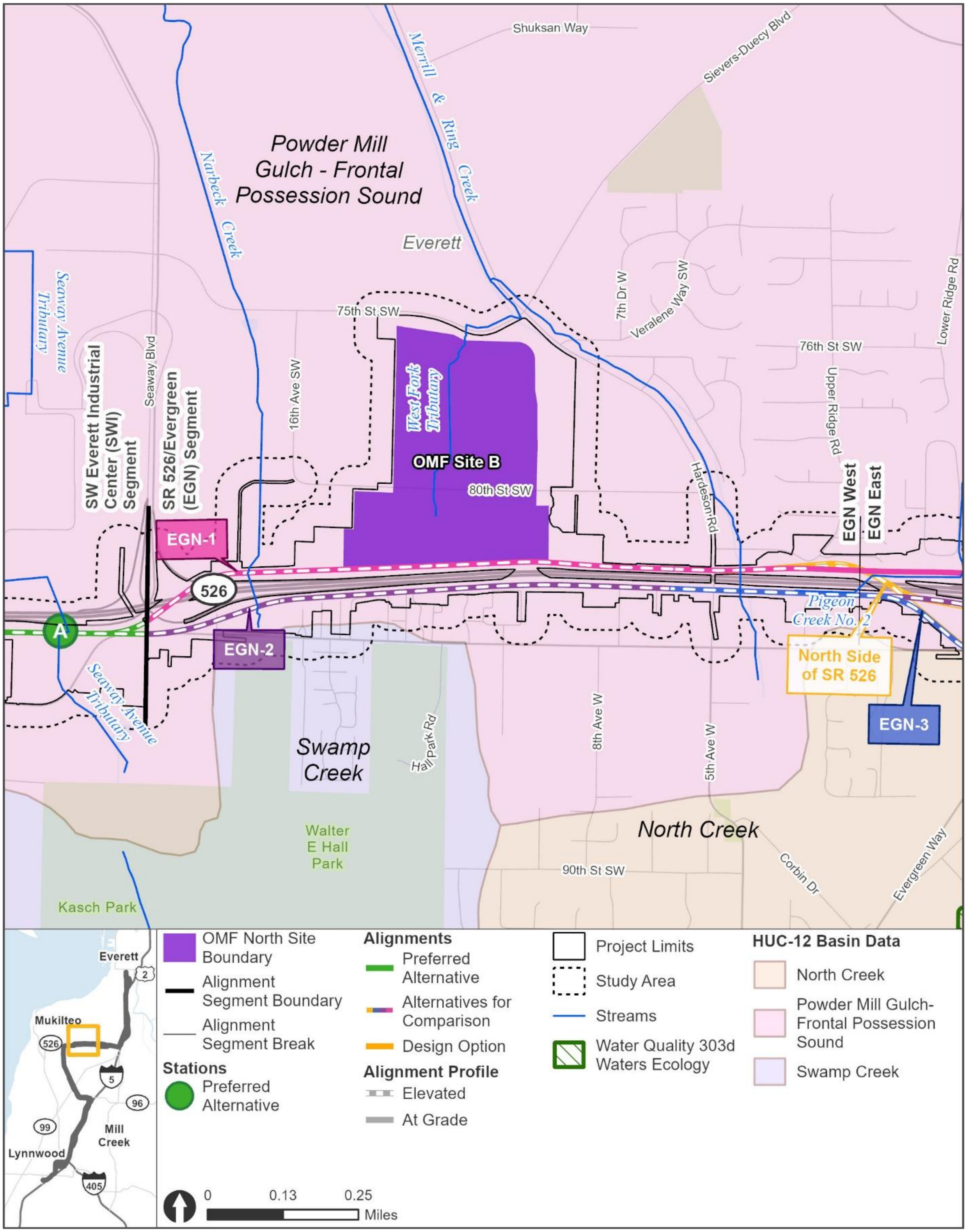
SOURCE: USGS (2023) and Ecology (2024a).

Figure 3-6 Drainage Basins – SW Everett Industrial Center Segment and OMF Site E



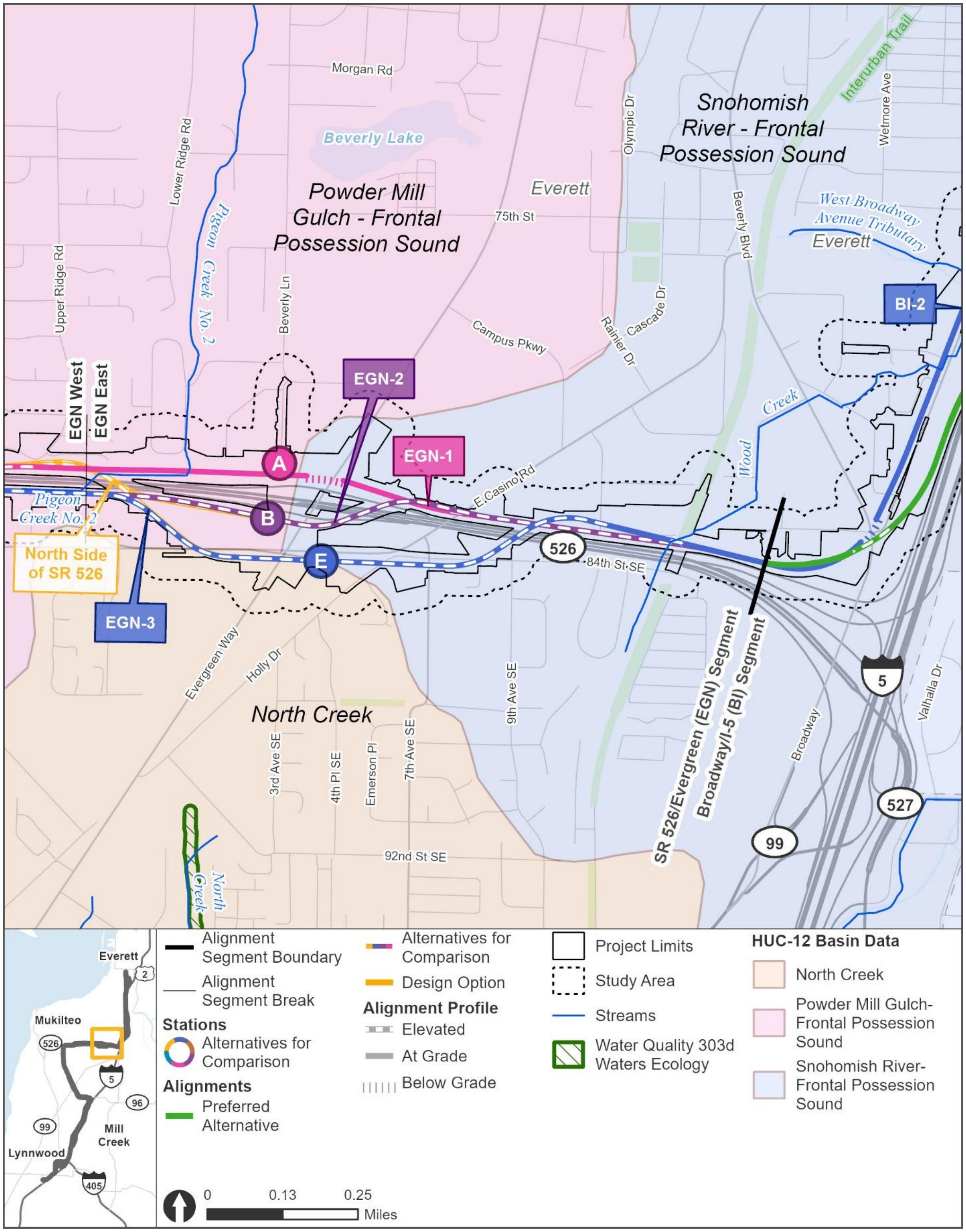
SOURCE: USGS (2023).

Figure 3-7 Drainage Basins – SR 526/Evergreen Segment (West) and OMF Site B



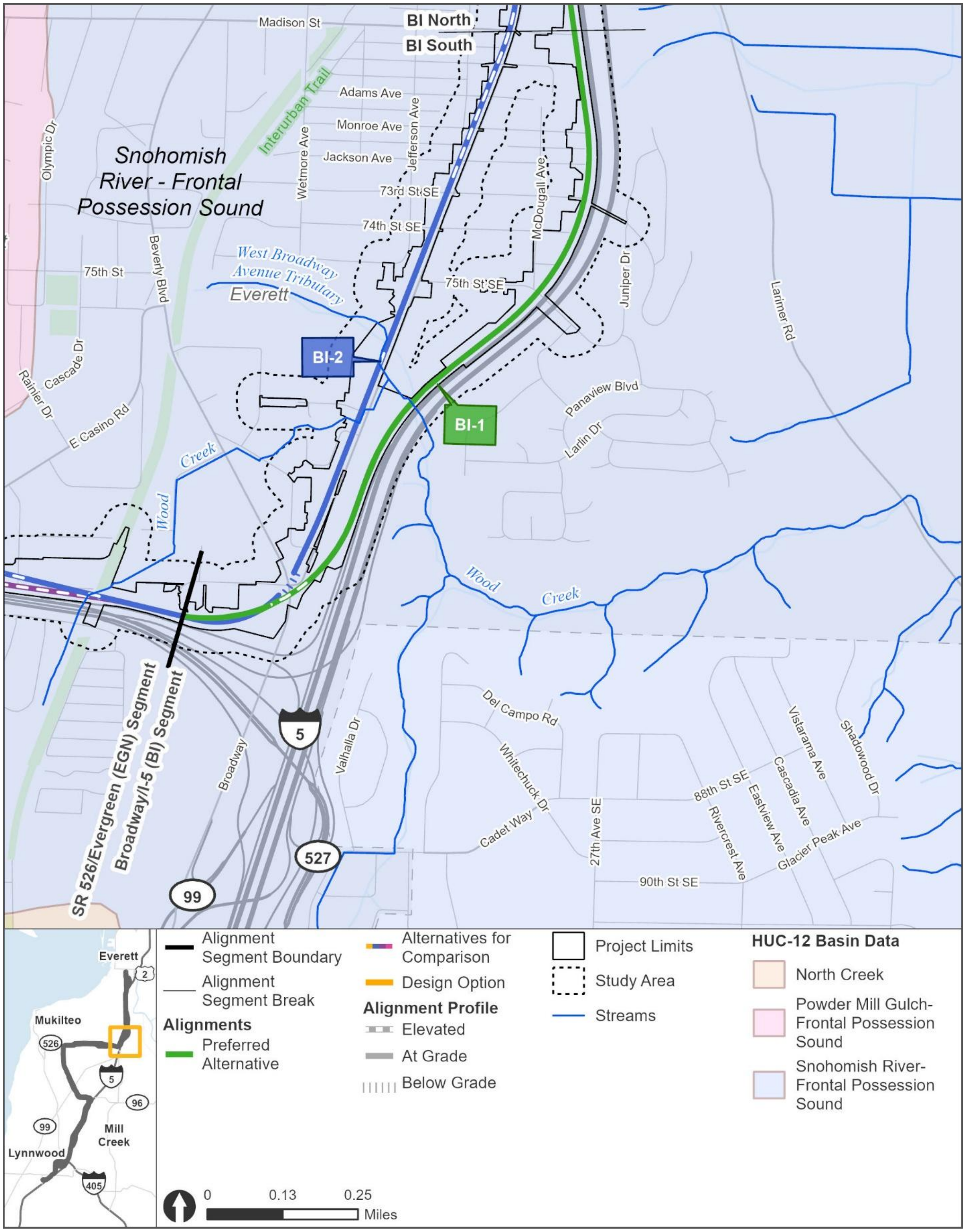
SOURCE: USGS (2023) and Ecology (2024a).

Figure 3-8 Drainage Basins – SR 526/Evergreen Segment (East)



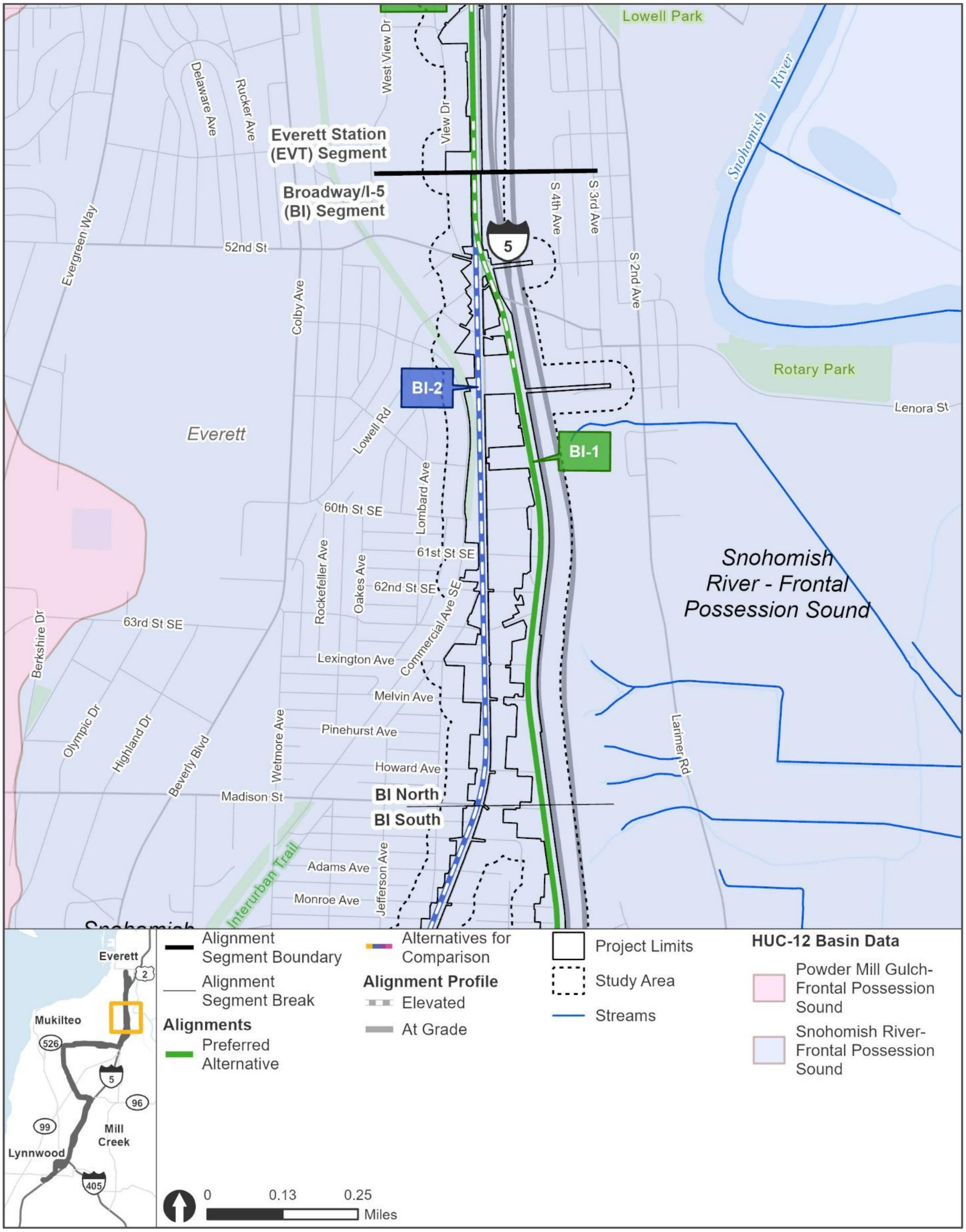
SOURCE: USGS (2023) and Ecology (2024a).

Figure 3-9 Drainage Basins – Broadway/I-5 Segment (South)



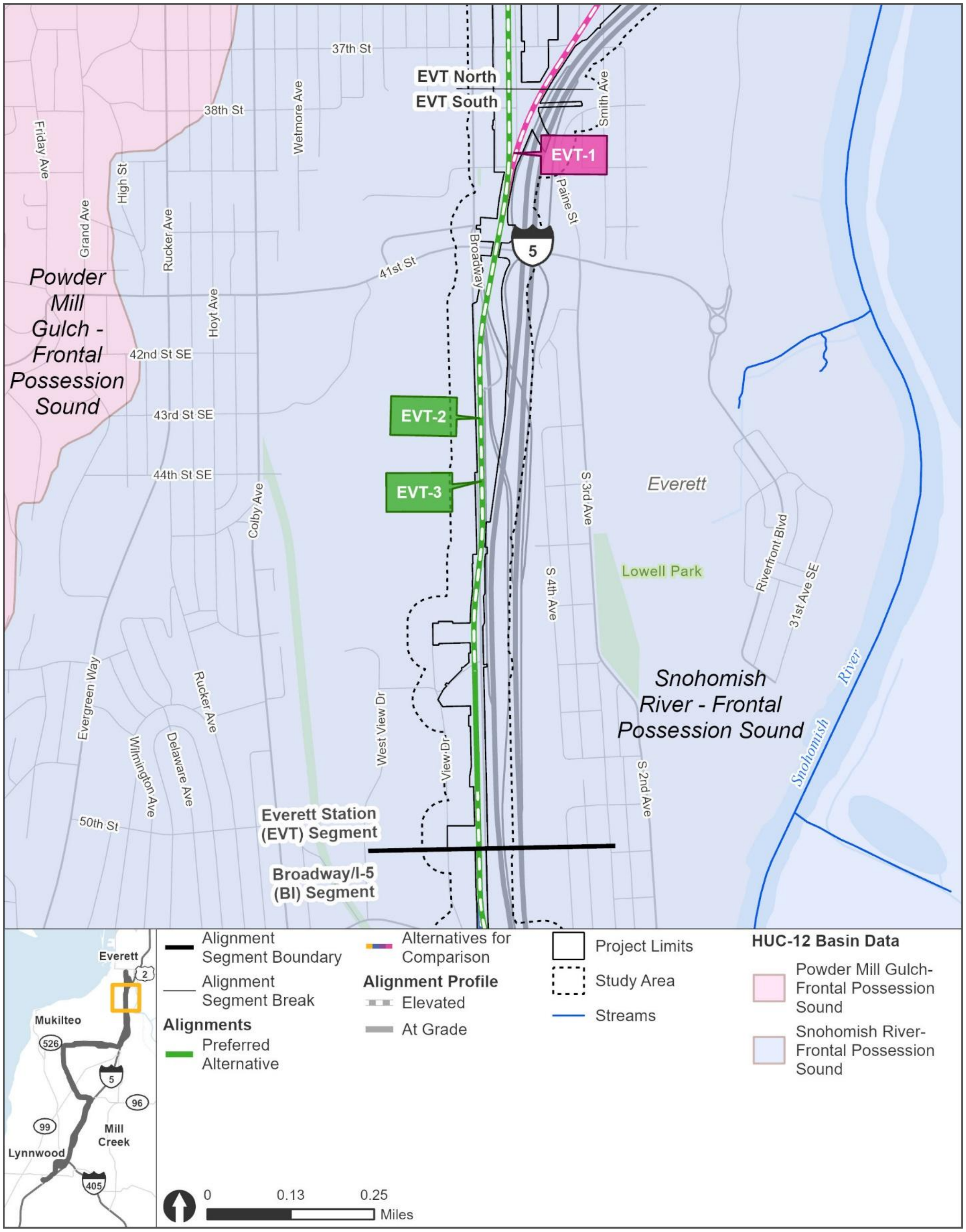
SOURCE: USGS (2023).

Figure 3-10 Drainage Basins – Broadway/I-5 Segment (North)



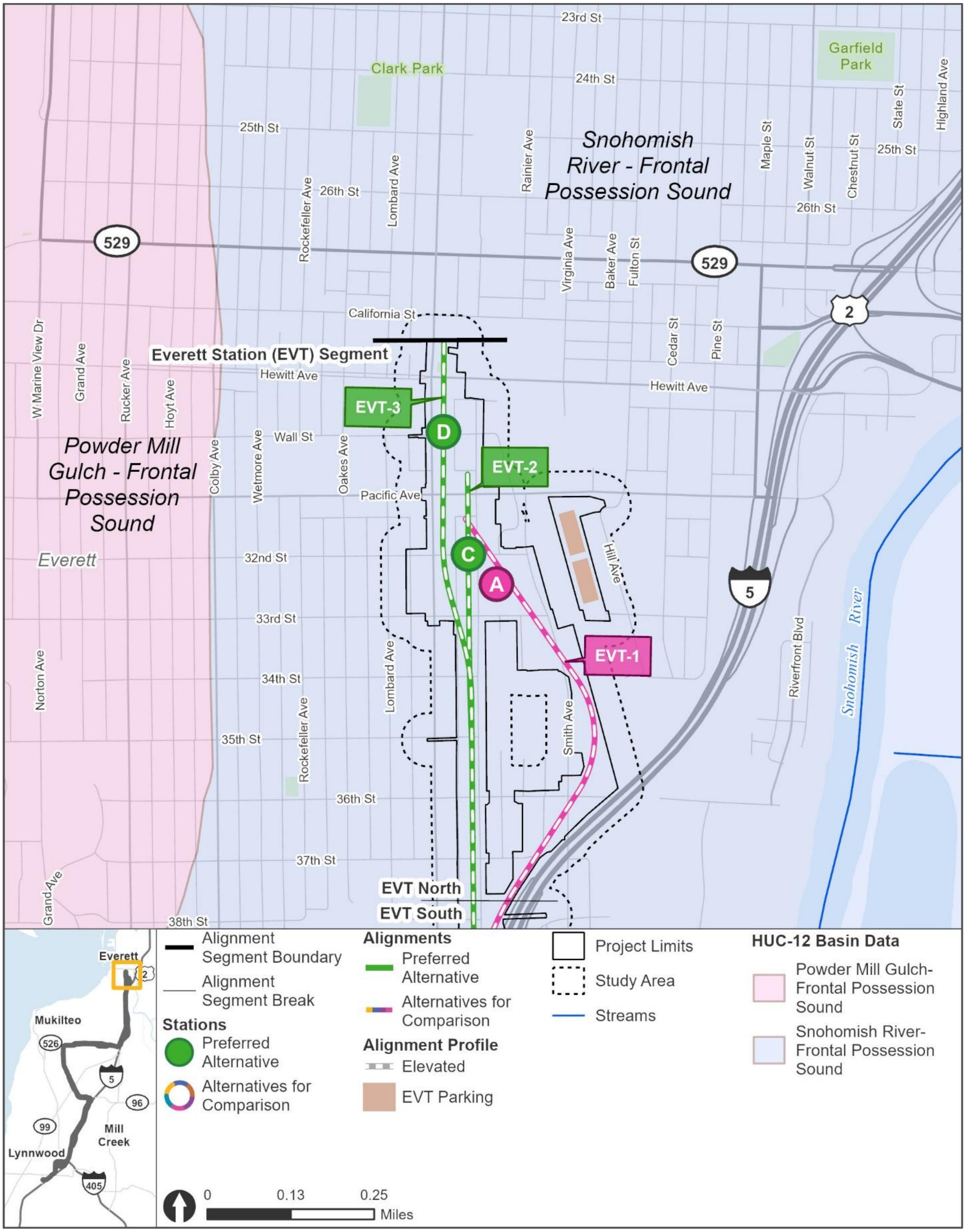
SOURCE: USGS (2023).

Figure 3-11 Drainage Basins – Everett Station Segment (South)



SOURCE: USGS (2023).

Figure 3-12 Drainage Basins – Everett Station Segment (North)



SOURCE: USGS (2023).

3.1.2 Lakes

No lakes exist within the study area. Surface water and stormwater within the project limits flow to three lakes outside of the study area: Lake Stickney (Figure 3-15, Figure 3-16), Martha Lake (Figure 3-14, Figure 3-15), and Lake Washington (not shown in figures). Swamp Creek (Figure 3-13 through Figure 3-17, Table 3-1) flows generally to the south and crosses the project limits adjacent to the intersection of Airport Road and Admiralty Way and then again at the I-5 and I-405 interchange. Swamp Creek flows through Lake Stickney between these points and eventually connects with the Sammamish River (not shown in figures) prior to flowing into Lake Washington. Martha Creek is the outlet of Martha Lake and is a tributary to Swamp Creek. Therefore, stormwater from within the project limits directly or indirectly discharges into Lake Stickney, Martha Lake, Swamp Creek, the Sammamish River, and then Lake Washington.

Martha Lake has a surface water connection through the project limits via Stream SSC1 (Figure 3-14, Table 3-1). Stormwater from within the project limits may reach Martha Lake by this stream connection. Both Martha Lake and Lake Stickney have been identified as priority habitats (WDFW 2023a) containing lacustrine wetlands and deep-water habitat for fish. For more detailed information on habitat, see the Ecosystems Technical Report in Draft EIS Appendix G.10. The Sammamish River and Lake Washington are not within the study area drainage basins. Lake Washington is listed as a 303(d) impaired water by Ecology (see the Ecosystems Technical Report in Draft EIS Appendix G.10 for 303(d) listing details).

3.1.3 Streams

Table 3-1 provides a summary of the streams identified in the study area (Figure 3-13 through Figure 3-27).

Table 3-1 Streams Within the Study Area

Stream	Alignment Segment	Stream Type[a]	Jurisdiction	Stream Subbasin
SLY2	ALD	Ns	Lynnwood	Swamp Creek
Poplar Creek	ALD	Np	Snohomish County	Swamp Creek
Swamp Creek	ALD / MAR	F	Snohomish County	Swamp Creek
Alder Creek	ASH	F	Snohomish County	Swamp Creek
		Np		
Ash Way Creek	ASH	F	Snohomish County	Swamp Creek
		Np		
SSC1	ASH	Np	Snohomish County	Swamp Creek
SSC3	ASH	Np	Snohomish County	Swamp Creek
		F		
York Creek Tributary	AIR	Ns	Snohomish County	Swamp Creek
		Np	Everett	Swamp Creek
		F		
SEV1	OMF Site E	Np	Everett	Swamp Creek
Hollow Dale Pl Tributary	OMF Site E	F	Everett	Swamp Creek
SEV2	OMF Site E	Np	Everett	Swamp Creek

Stream	Alignment Segment	Stream Type[a]	Jurisdiction	Stream Subbasin
SSC2	ASH	F	Snohomish County	North Creek
		Ns		
Seaway Avenue Tributary	SWI	F	Everett	Powder Mill Gulch
Narbeck Creek	EGN	Ns / F[b]	Everett	Narbeck Creek
West Fork Tributary	EGN / OMF Site B	Ns	Everett	Merrill & Ring Creek
Merrill & Ring Creek	EGN	Np / F[b]	Everett	Merrill & Ring Creek
Pigeon Creek No. 2	EGN	Ns	Everett	Pigeon Creek No. 2
		F		
Wood Creek	EGN / BI	Ns	Everett	Wood Creek
		F		
West Broadway Avenue Tributary	BI	Ns	Everett	Wood Creek
		F		

NOTES:

a) Stream typing was done in accordance with Lynnwood Municipal Code (LMC) 17.10.070, Everett Municipal Code (EMC) 19.37.160, and SCC 30.62A.230 (City of Lynnwood 2024a, City of Everett 2024, Snohomish County 2024a).

b) WDFW has determined that both Narbeck Creek and Merrill & Ring Creek provide suitable habitat for multiple anadromous and residential fish.

3.1.4 Stream Crossings

The Build Alternatives would cross streams in numerous locations within the project limits. These stream crossings are summarized in Table 3-2. Water crossing structures (pipes, culverts, and bridges) built to older standards can sometimes be undersized, contributing to maintenance issues, flooding, and impeding fish passage. For additional information on fish passage barriers, see the Ecosystems Technical Report in Draft EIS Appendix G.10.

Figure 3-13 through Figure 3-27 display the surface waterbodies, streams, and stream crossings within the study area.

Table 3-2 Streams Crossings Within the Study Area

EVLE ID	WDFW Site ID	Stream	Alignment Segment/ OMF Site	Stream Type[a]	Fish Passage Barrier	Structure Description
SC 1	XID2245	Poplar Creek	ALD	Ns	No	60-inch corrugated steel pipe under Birch Way
SC 2	993127	Swamp Creek	ALD	F	No	10-foot-wide squash corrugated steel pipe under Maple Road
SC 3	993126			F	No	60-inch and 64-inch round corrugated steel pipes under an unnamed WSDOT access road
SC 4	993090			F	No	64-inch and 70-inch round corrugated steel pipes under I-5
SC 5	939003		MAR	F	Yes	12-foot precast concrete box culvert under a private driveway
SC 6	993828			F	Yes	64-inch round corrugated steel pipe under an unnamed Snohomish County access road
SC 7	993827			F	Yes	72-inch round stainless-steel pipe under Airport Road
SC 8	N/A	Alder Creek	ASH	Np	No	24-inch concrete pipe under the Interurban Trail
SC 9	996229			Np	No	42-inch concrete pipe under I-5
SC 10	102 S105			F	No	44-inch corrugated metal pipe under Alder Way
SC 11	996230	Ash Way Creek	ASH	Np	No	24-inch concrete pipe under I-5
SC 12	102 S127			Np	No	24-inch corrugated metal pipe under a private property
SC 13						24-inch high density polyethylene pipe under 20th Avenue W
SC 14	939014			F	No	72-inch corrugated metal pipe under a private multifamily property
SC 15	939006	Stream SSC1	ASH	F	Yes	36-inch precast concrete pipe under I-5
SC 16	939005			F	Yes	30-inch ductile iron pipe under the Interurban Trail and residential properties
SC 17	XID2165	Stream SSC3	ASH	F	Yes	36-inch precast concrete pipe under Ash Way

EVLE ID	WDFW Site ID	Stream	Alignment Segment/ OMF Site	Stream Type[a]	Fish Passage Barrier	Structure Description
SC 18	N/A	York Creek Tributary	AIR	Ns	No	36-inch precast concrete pipe under Airport Road
SC 19	102 S100			F	Unknown	72-inch precast concrete pipe under 112th Street SW
SC 20	939038			F	Yes	16-inch precast concrete pipe under a Mukilteo Sewer District access road
SC 21	939037			F	Yes	30-inch round precast concrete pipe under private properties
SC 22	XID3580			F	Yes	30-inch round corrugated metal pipe under private properties, SR 99, and Center Road
SC 23	N/A	Stream SEV1	AIR / OMF Site E	Np	No	12-inch concrete pipe under Holly Drive
SC 24	420764	Hollow Dale Pl Tributary	OMF Site E	Np	No	18-inch corrugated steel pipe
SC 25	N/A			F	Unknown	12-inch to 36-inch pipes of unknown materials
SC 26					Yes	
SC 27					Unknown	
SC 28					Unknown	
SC 29					Unknown	
SC 30					Unknown	
SC 31	102 N164	Stream SSC2	ASH	F	Yes	30-inch polyvinyl chloride pipe under a private drive, west of Meadow Road
SC 32	102 N165				Yes	Two 42-inch squash corrugated steel pipes under Meadow Road
SC 33	939011	Seaway Avenue Tributary	SWI	F	Yes	48-inch precast concrete pipe under Casino Road and a private property
SC 34	936665				Yes	48-inch precast concrete pipe under SR 526
SC 35	934605	Narbeck Creek	EGN	Ns / F[b]	No	42-inch concrete pipe under SR 526
SC 36	N/A				Unknown	24-inch polyethylene pipe under Snohomish County Public Utility District Maintenance Facility

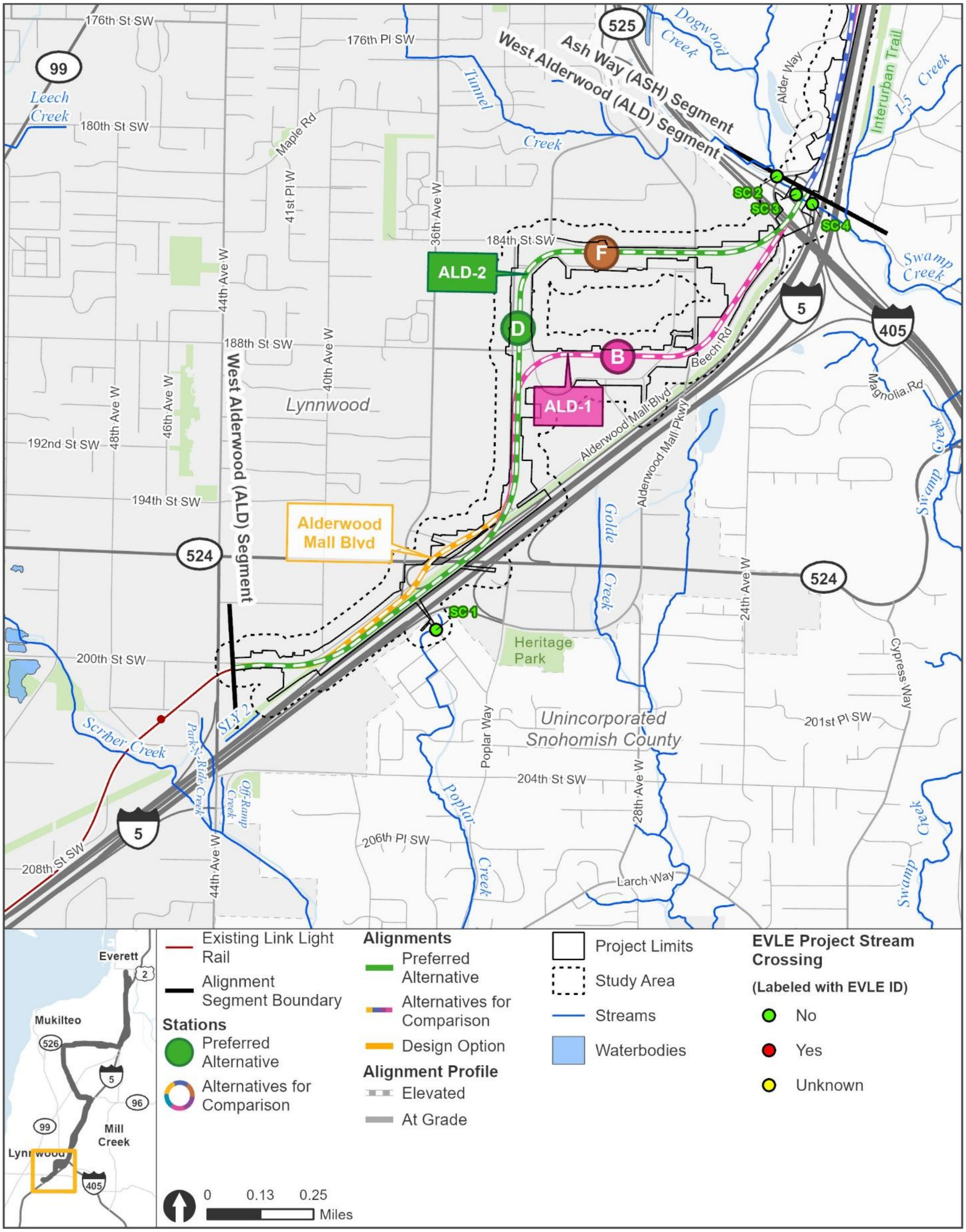
EVLE ID	WDFW Site ID	Stream	Alignment Segment/ OMF Site	Stream Type[a]	Fish Passage Barrier	Structure Description
SC 37	N/A	West Fork Tributary	OMF Site B	Ns	No	15-inch concrete pipe, 18-inch corrugated metal pipe under 80th Street SW and private property
SC 38					No	30-inch corrugated polyethylene pipe on private property
SC 39					No	30-inch corrugated polyethylene pipe on private property
SC 40					No	12-inch concrete pipe under 75th Street SW
SC 41	995127	Merrill & Ring Creek	EGN	Np / F[b]	Yes	48-inch corrugated steel pipe under SR 526 and Upper Ridge Road
SC 42	933666				Unknown	36-inch stainless steel pipe on private property
SC 43	920581		OMF Site B		Unknown	36-inch corrugated steel pipe under Veralene Way SW
SC 44	N/A				Unknown	30-inch concrete pipe under a private driveway
SC 45	920583				Unknown	30-inch to 36-inch precast concrete pipe
SC 46	936720	East Fork Pigeon Creek No. 2	EGN	Ns	No	18-inch precast concrete pipe under SR 526
SC 47	939017				No	15-inch precast concrete pipe within WSDOT right-of-way
SC 48	939020				No	15-inch precast concrete pipe within WSDOT right-of-way
SC 49	939016				No	18-inch precast concrete pipe within WSDOT right-of-way
SC 50	939019			F	Yes	30-inch precast concrete pipe under East Glen Drive
SC 51	N/A	Wood Creek	EGN	Ns	No	42-inch pipe under 84th Street SE, SR 526, and Interurban Trail
SC 52	939039		BI	F	Yes	24-inch precast concrete pipe under private property and Broadway
SC 53	995262			F	Yes	30-inch to 42-inch precast concrete pipe under private property and I-5
SC 54	995262	West Broadway Avenue Tributary	BI	F	Yes	30-inch precast concrete pipe under Broadway

NOTES:

a) Stream typing was done in accordance with LMC 17.10.070, EMC 19.37.160, and SCC 30.62A.230 (City of Lynnwood 2024a, City of Everett 2024, Snohomish County 2024a).

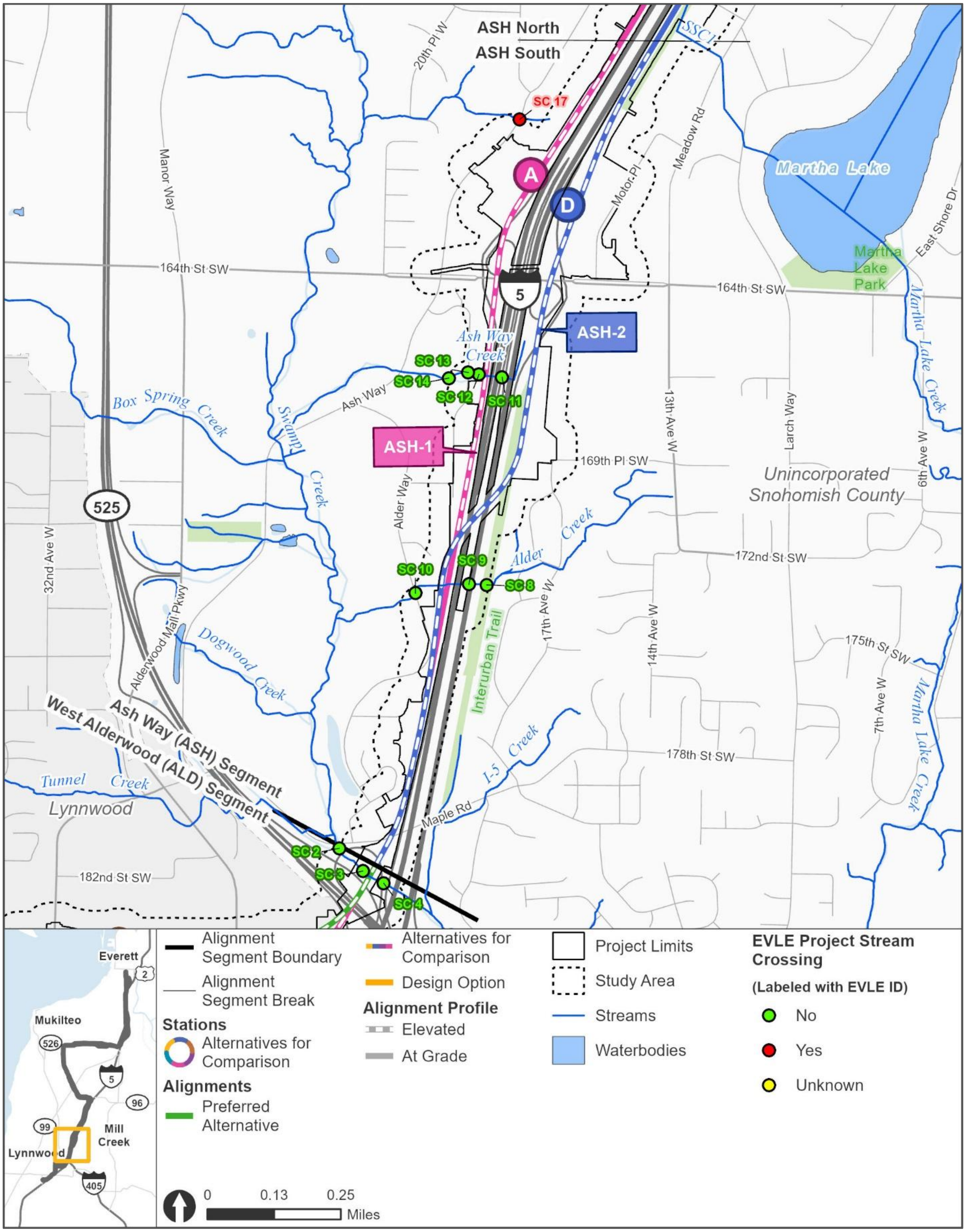
b) WDFW has determined that both Narbeck Creek and Merrill & Ring Creek provide suitable habitat for multiple anadromous and residential fish.

Figure 3-13 Existing Surface Waters – West Alderwood Segment



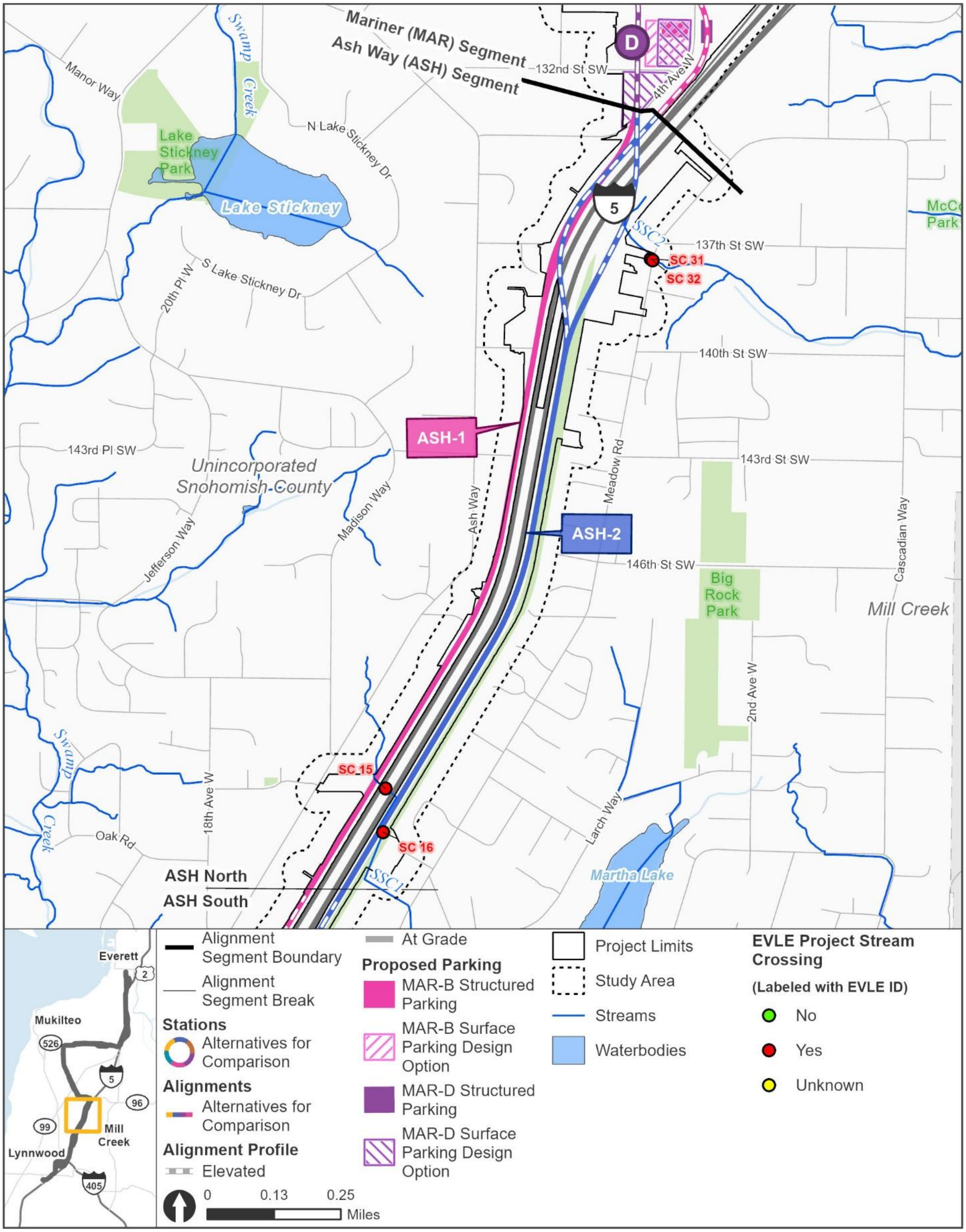
SOURCE: Snohomish County (2023).

Figure 3-14 Existing Surface Waters – Ash Way Segment (South)



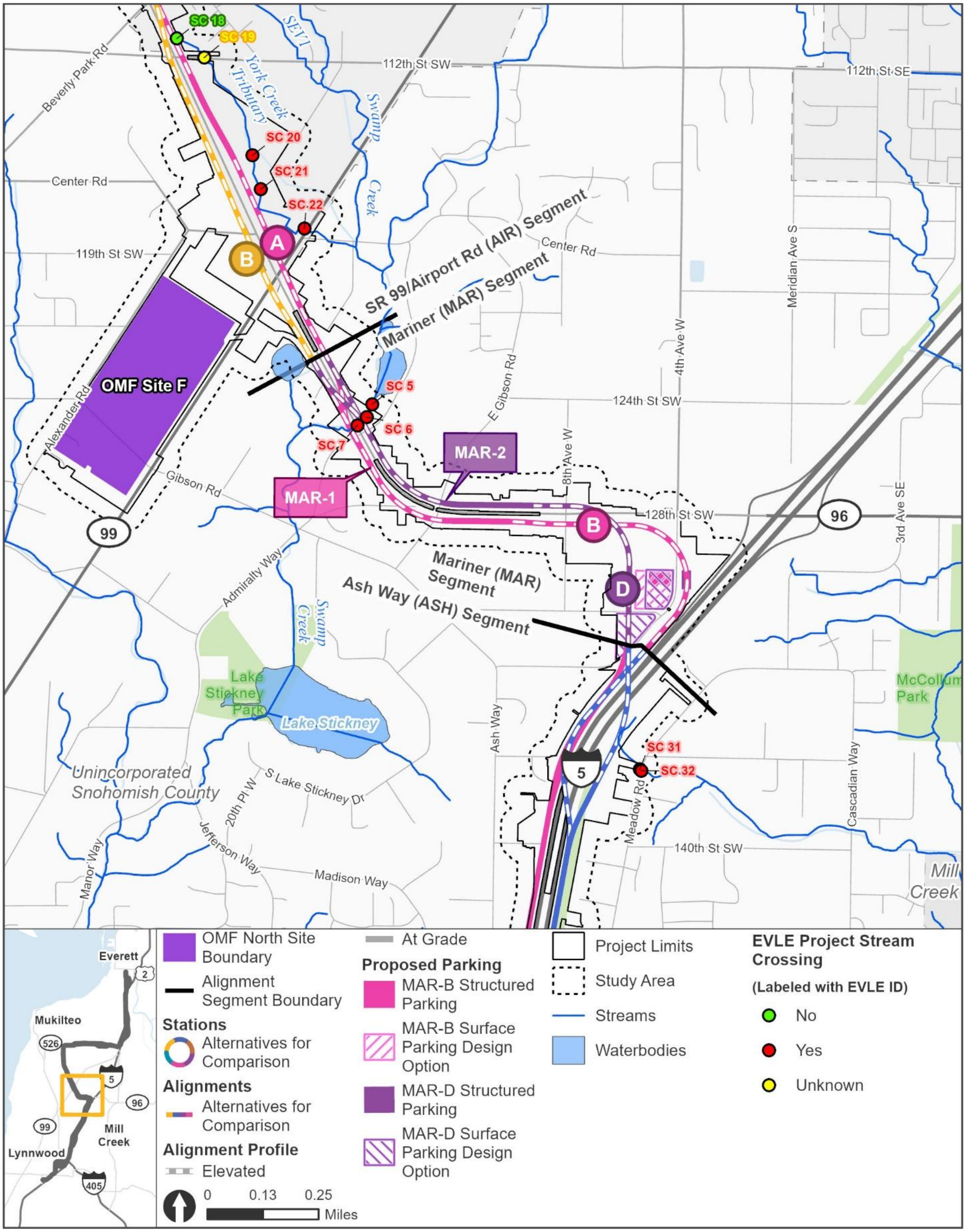
SOURCE: Snohomish County (2023).

Figure 3-15 Existing Surface Waters – Ash Way Segment (North)



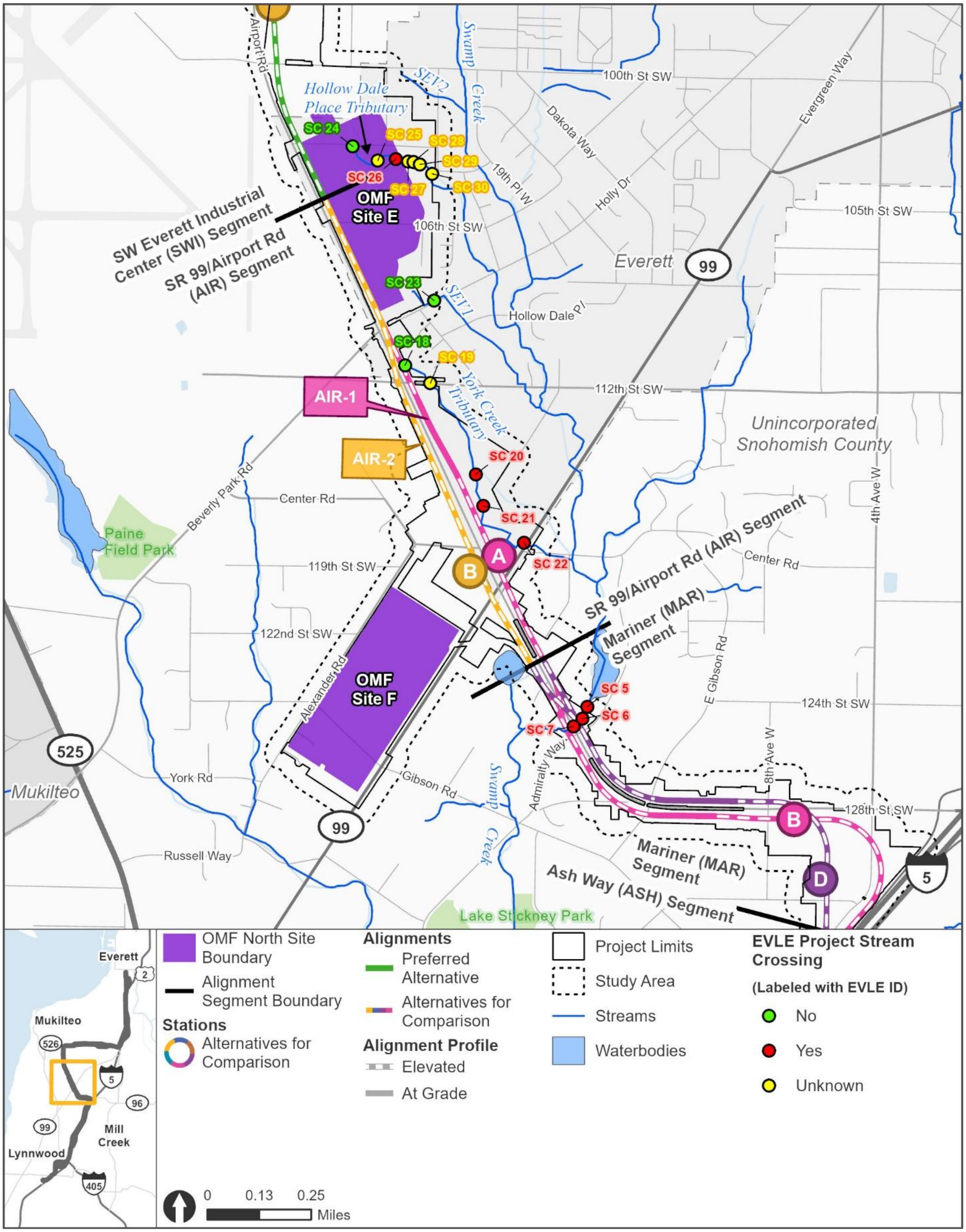
SOURCE: Snohomish County (2023).

Figure 3-16 Existing Surface Waters – Mariner Segment



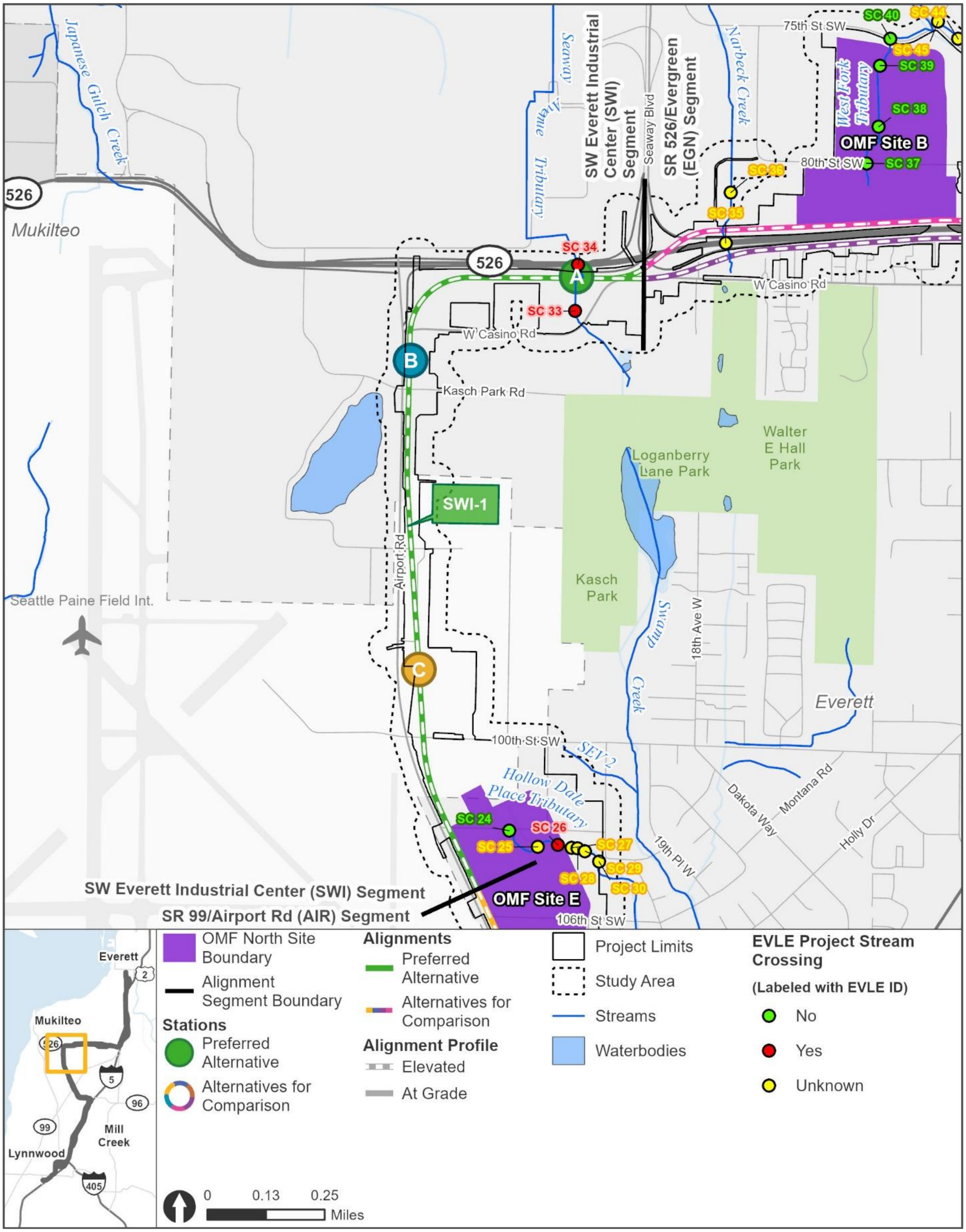
SOURCE: Snohomish County (2023).

Figure 3-17 Existing Surface Waters – SR 99/Airport Road Segment and OMF Sites F and E



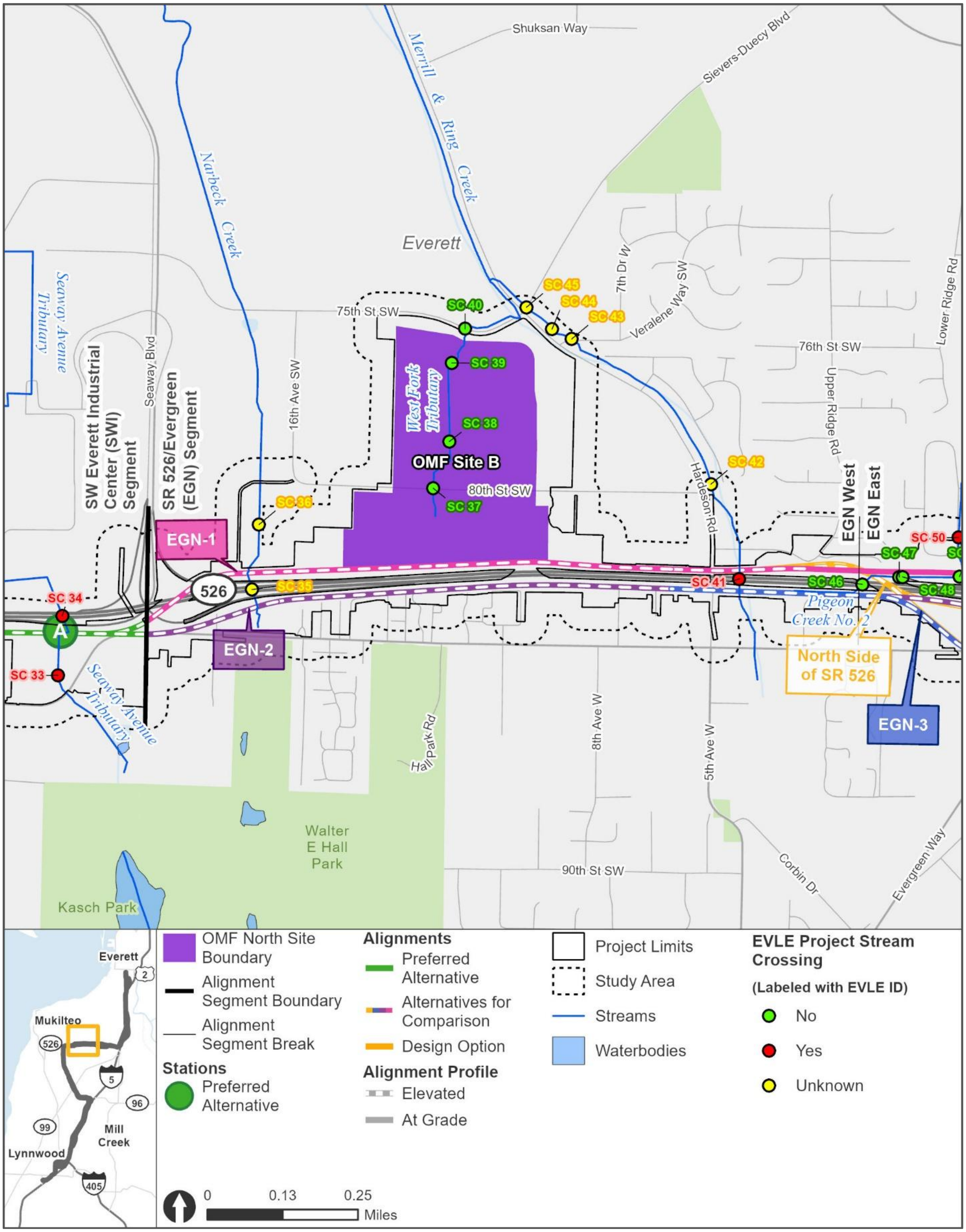
SOURCE: Snohomish County (2023).

Figure 3-18 Existing Surface Waters – SW Everett Industrial Center Segment and OMF Site E



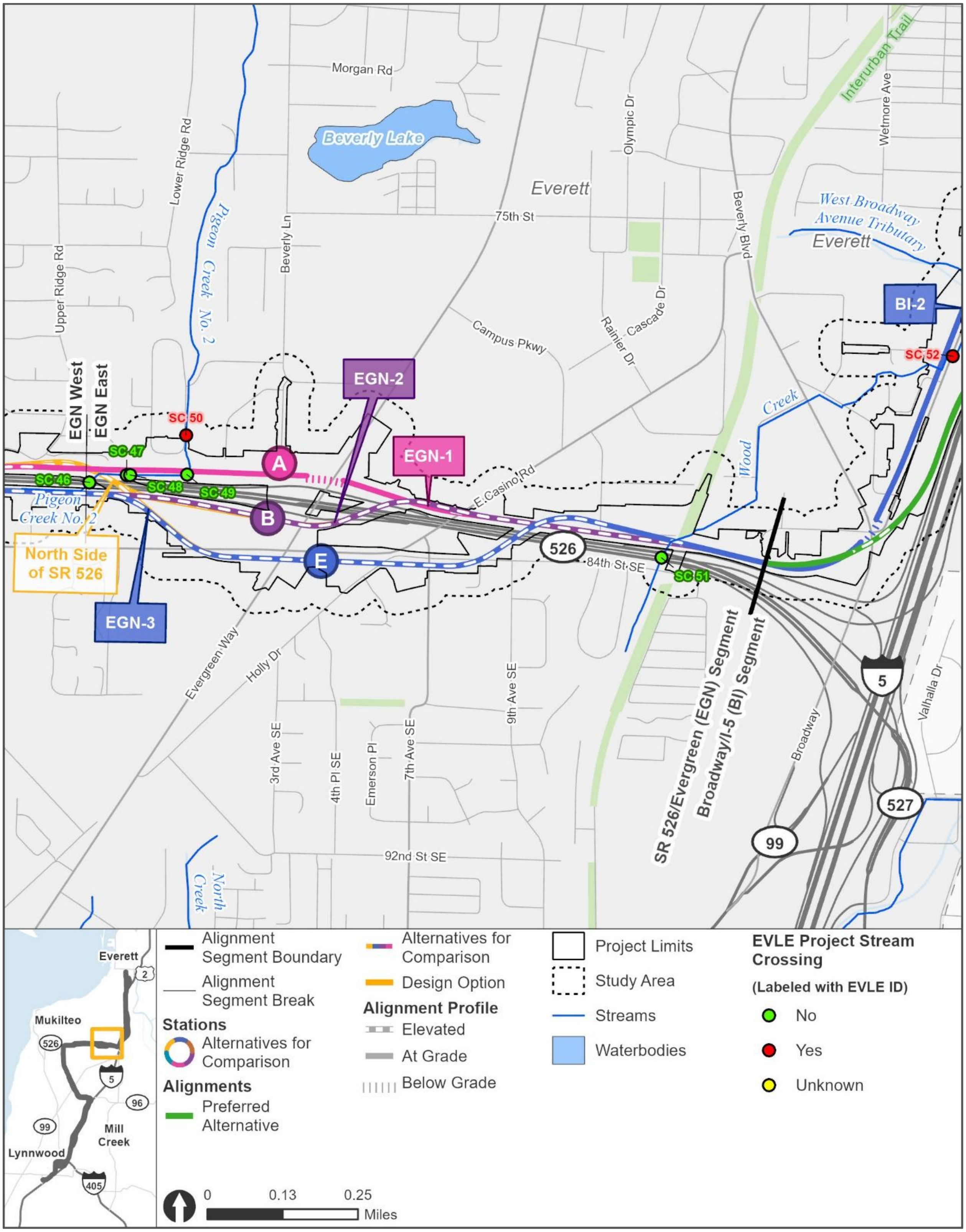
SOURCE: Snohomish County (2023).

Figure 3-19 Existing Surface Waters – SR 526/Evergreen Segment (West) and OMF Site B



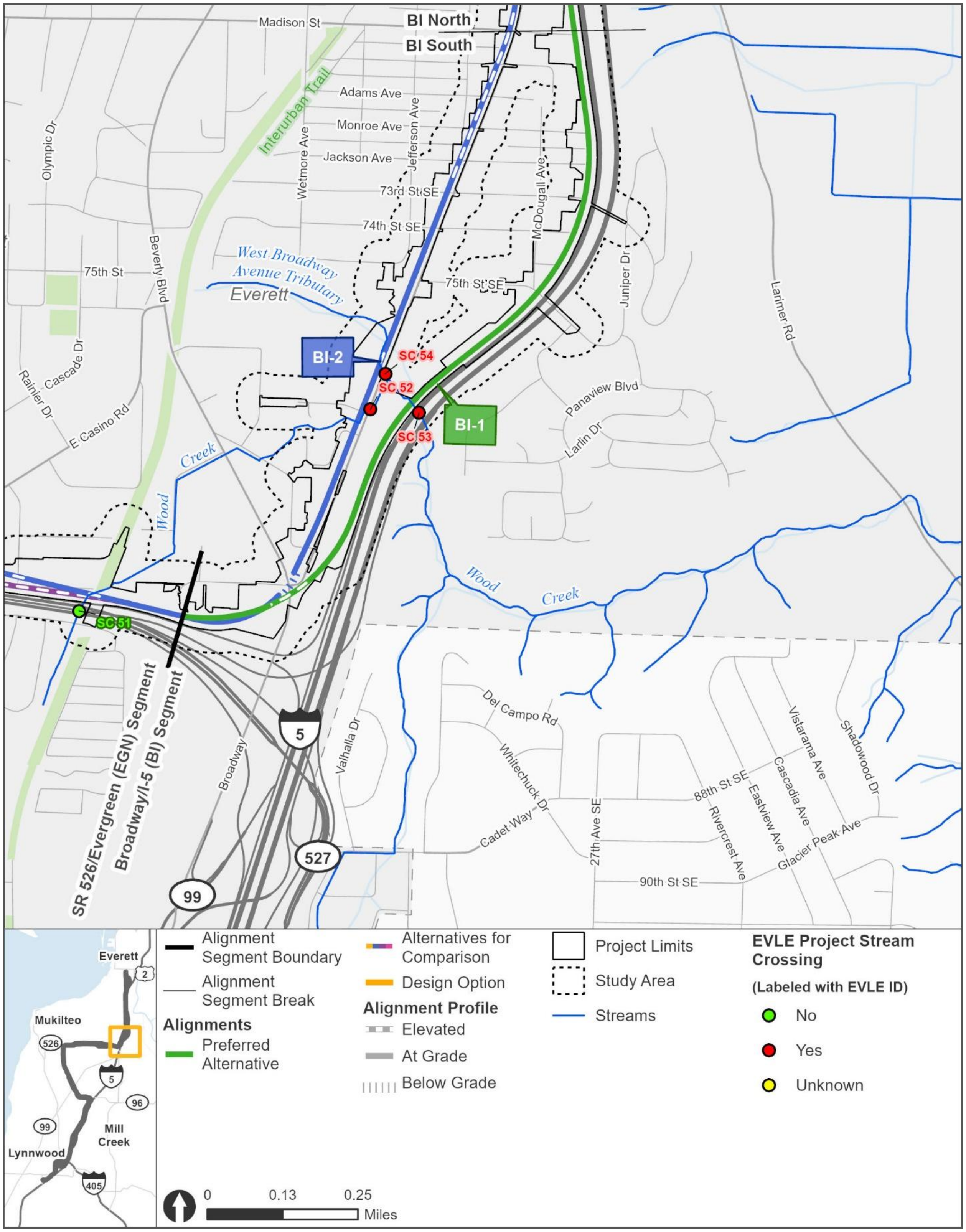
SOURCE: Snohomish County (2023).

Figure 3-20 Existing Surface Waters – SR 526/Evergreen Segment (East)



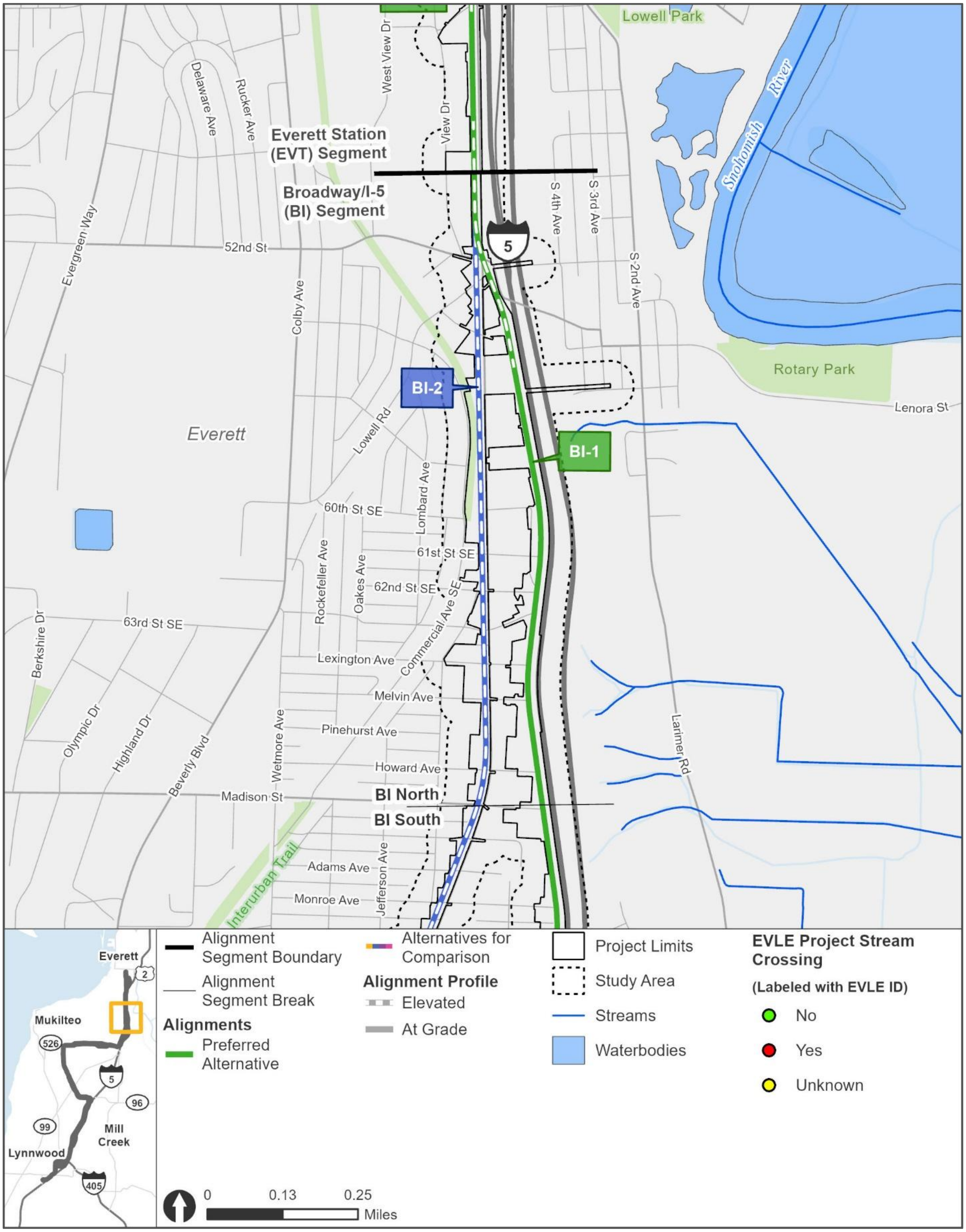
SOURCE: Snohomish County (2023).

Figure 3-21 Existing Surface Waters – Broadway/I-5 Segment (South)



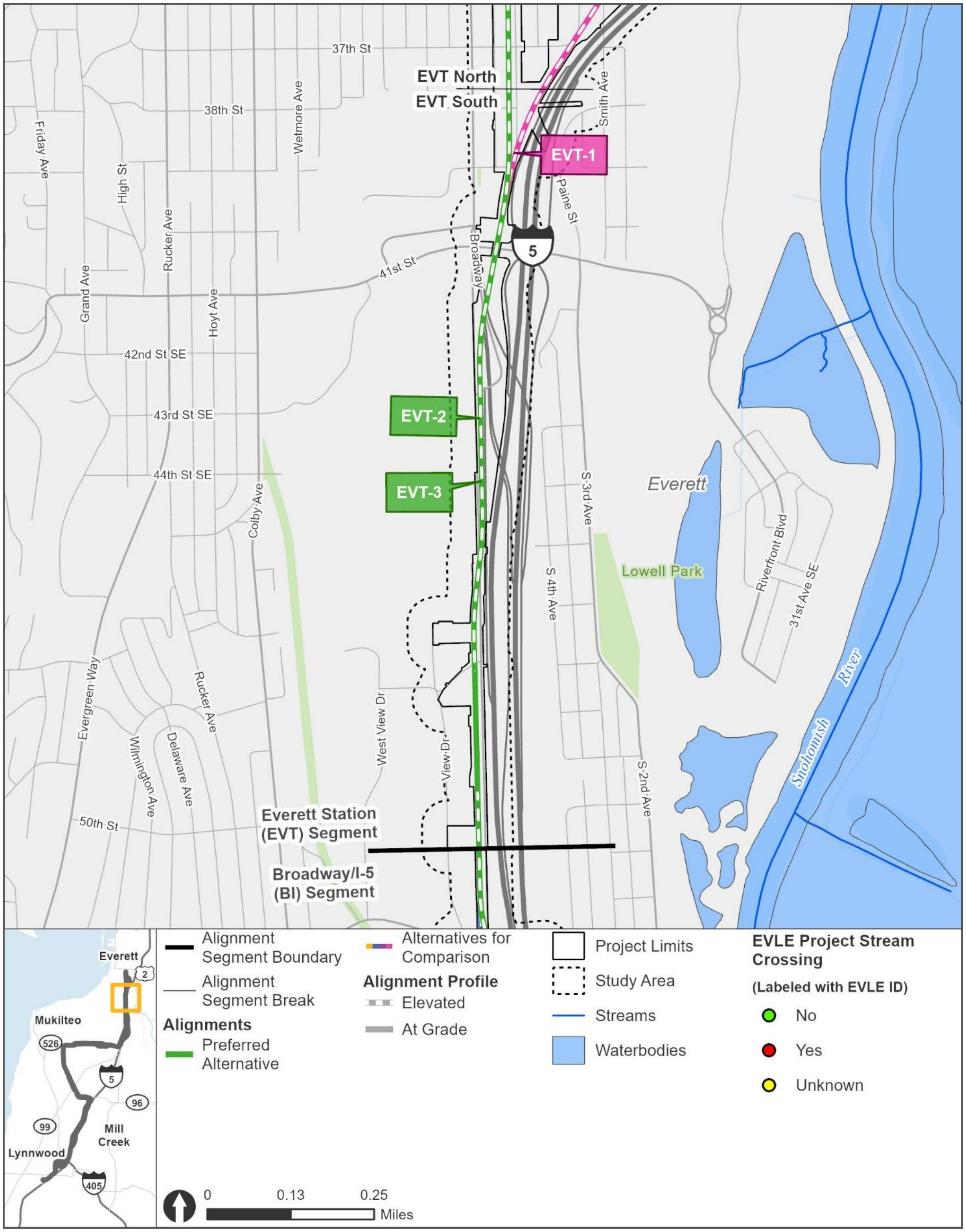
SOURCE: Snohomish County (2023).

Figure 3-22 Existing Surface Waters – Broadway/I-5 Segment (North)



SOURCE: Snohomish County (2023).

Figure 3-23 Existing Surface Waters – Everett Station Segment (South)

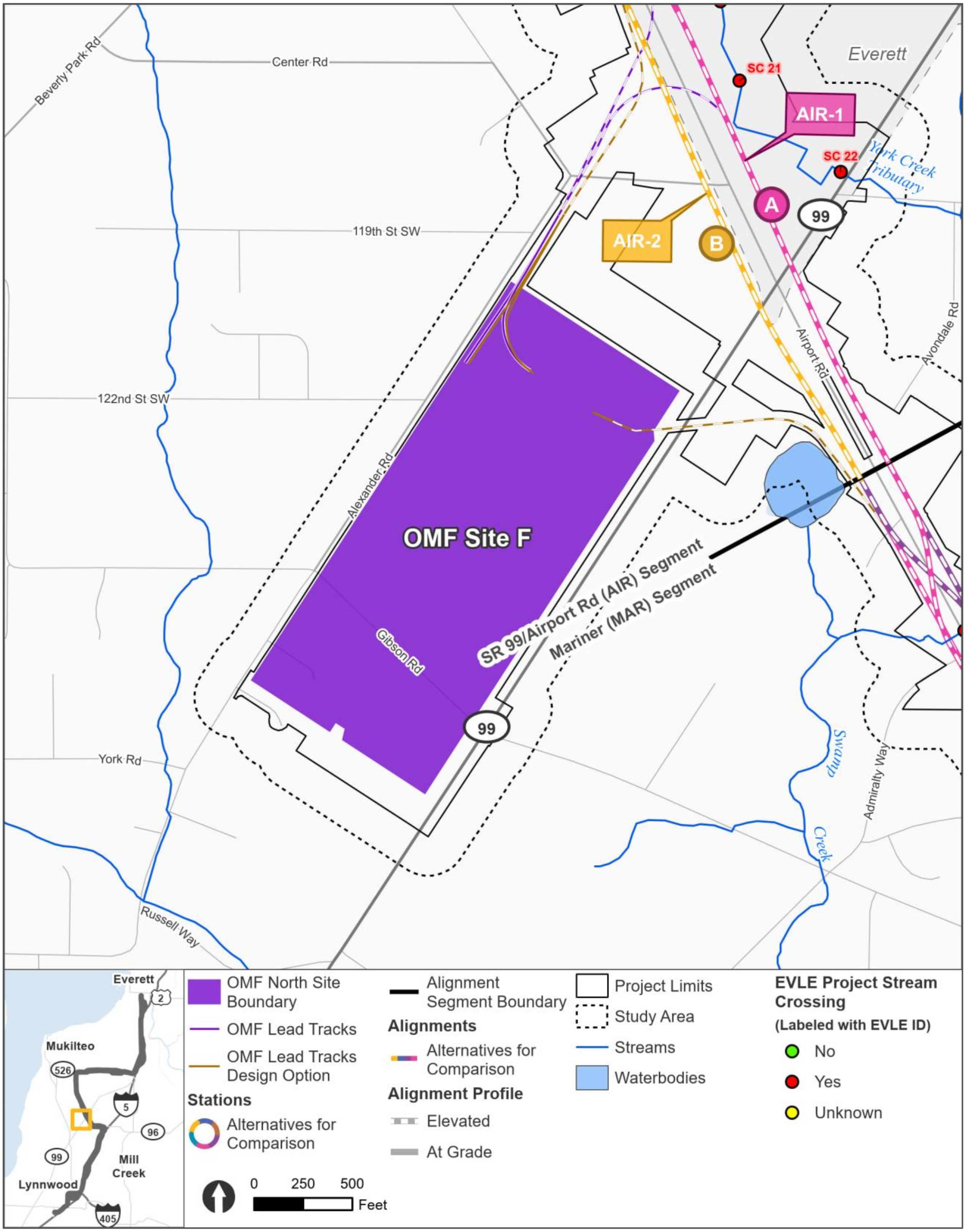


SOURCE: Snohomish County (2023).

Figure 3-24 Existing Surface Waters – Everett Station Segment (North)

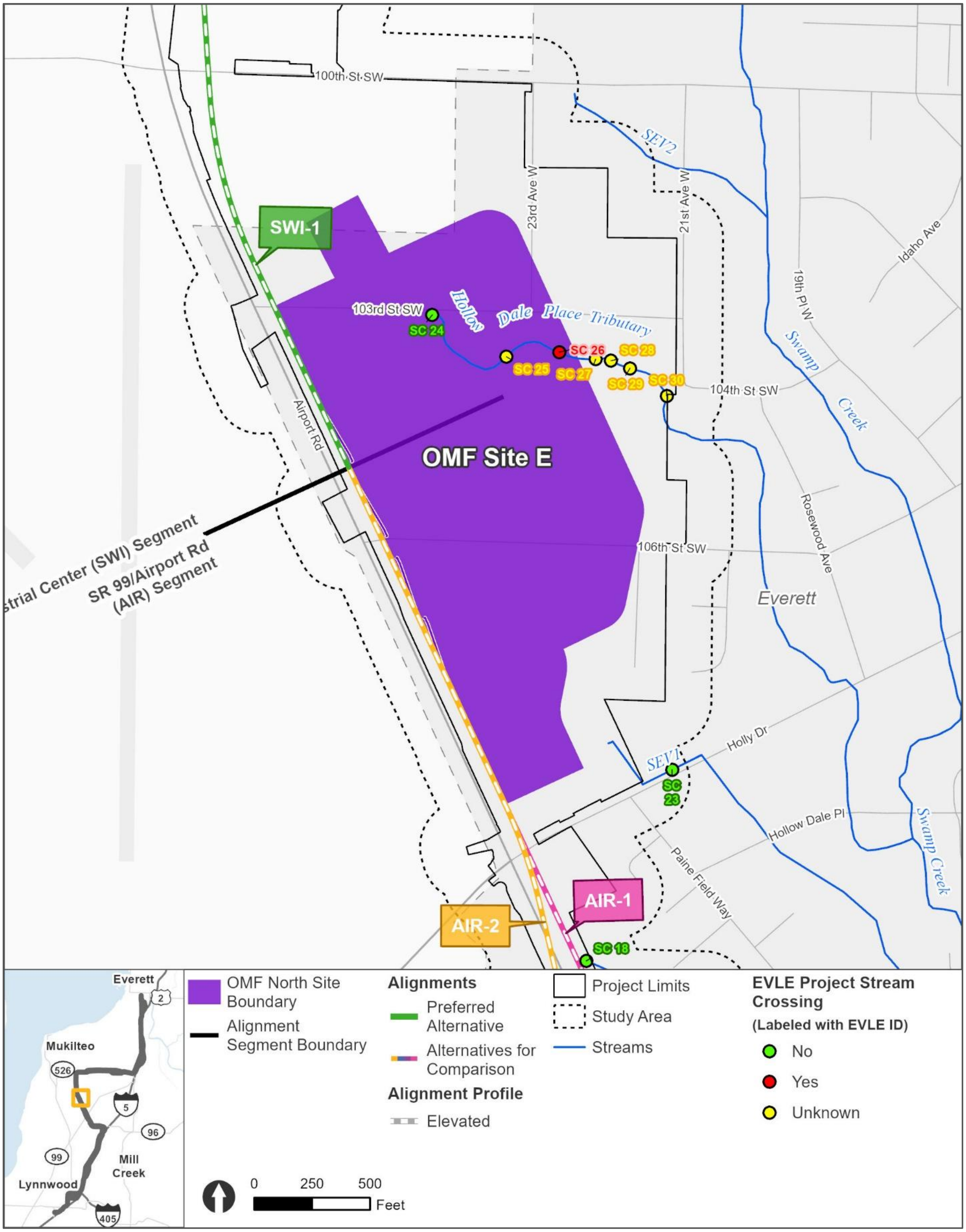
SOURCE: Snohomish County (2023).

Figure 3-25 Existing Surface Waters – OMF Site F



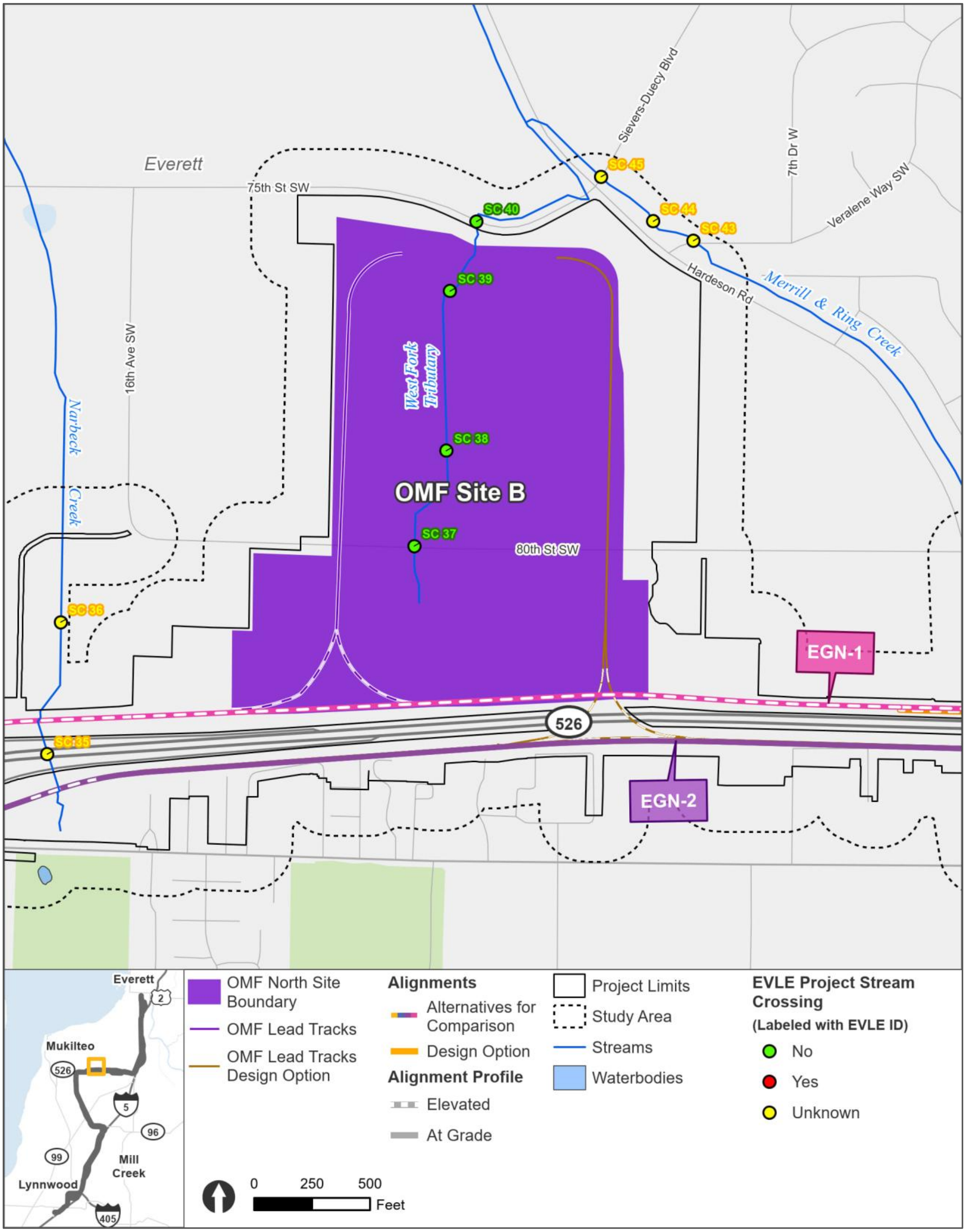
SOURCE: Snohomish County (2023).

Figure 3-26 Existing Surface Waters – OMF Site E



SOURCE: Snohomish County (2023).

Figure 3-27 Existing Surface Waters – OMF Site B



SOURCE: Snohomish County (2023).

3.2 Stormwater

Stormwater is managed to address different types of land cover and impervious surfaces (PGIS or NPGIS). The types of land uses and cover within the study area are undeveloped natural areas, such as wetlands, streams, ponds, lakes, and upland forests; parks and open space; vacant land; single-family and multi-family residential; commercial; industrial; institution/public; mixed use; transportation and utilities; and other, which includes atypical land use designations where they do not fit into the other categories, such as farmland. Further information about land use can be found in the Land Use Technical Report in Draft EIS Appendix G.3. Existing PGIS within the study area is associated with various types of land uses and is a significant source of pollutants in stormwater runoff. These surfaces are regularly subject to vehicular use, industrial activities, and storage of erodible or leachable materials, wastes, or chemicals. Metal roofs not coated with inert, non-leachable materials are also considered to be PGIS.

Examples of PGIS (Snohomish County 2021) that may be found in the study area include, but are not limited to:

- Roads.
- Unfenced fire lanes.
- Unvegetated road shoulders.
- Driveways.
- Parking lots.
- Vehicular equipment storage yards.

NPGIS areas are not a significant source of pollutants in stormwater runoff. Examples of NPGIS, some of which are found in the study area, include, but are not limited to:

- Light rail guideway.
- Roofs made of inert, non-leachable materials.
- Paved bicycle pathways separated from and not subject to drainage from roads for motor vehicles.
- Fenced fire lanes.
- Infrequently used maintenance access roads.
- Sidewalks/trails.

Estimates of existing surface cover types within 200 feet of the project limits of the proposed alternatives, including NPGIS and PGIS, are included in Table 3-3. These area calculations (acres) are preliminary estimates and have not been surveyed. Table 3-4 summarizes the existing stormwater features along the alignment.

Table 3-3 Existing Surface Cover Types Within Study Area (Project Limits + 200 Feet)

Alignment Segment/ OMF	Alternative	Existing Surface Cover Type (acres)		
		NPGIS	PGIS	Pervious
West Alderwood	ALD-1B	8.3	36.5	18.9
	ALD-1B with Alderwood Mall Boulevard Design Option	8.3	33.0	16.5
	ALD-2D	7.6	36.5	18.9
	ALD-2D with Alderwood Mall Boulevard Design Option	7.6	33.0	16.6
	ALD-2F	7.4	34.4	16.9
	ALD-2F with Alderwood Mall Boulevard Design Option	7.4	34.4	16.9
Ash Way	ASH-1A	3.5	23.6	53.4
	ASH-2D	3.9	22.4	90.9
Mariner	MAR-1B	11.0	28.1	20.6
	MAR-1B with Surface Parking Design Option	11.0	28.1	20.6
	MAR-2D	10.2	24.6	18.8
	MAR-2D with Surface Parking Design Option	10.0	20.2	17.8
SR 99/Airport Road	AIR-1A	6.1	19.5	27.0
	AIR-2B	6.5	21.4	16.5
SW Everett Industrial Center	SWI-1A	7.2	23.6	24.8
	SWI-1A with Lower Design Option	9.6	27.4	29.5
	SWI-1B	5.3	21.4	23.2
	SWI-1C	7.7	26.4	26.5
SR 526/Evergreen	EGN-1A	5.5	20.5	42.5
	EGN-2B	7.8	24.5	31.0
	EGN-2B with North Side of SR 526 Design Option	6.3	24.2	35.9
	EGN-3E	6.8	22.8	30.3
	EGN-3E with North Side of SR 526 Design Option	5.3	22.5	35.2
Broadway/I-5	BI-1	6.7	16.0	34.5
	BI-2	8.8	19.1	28.7
Everett Station	EVT-1A	8.1	31.0	20.6
	EVT-2C	12.4	30.9	15.6
	EVT-3D	13.1	34.9	16.1

Alignment Segment/ OMF	Alternative	Existing Surface Cover Type (acres)		
		NPGIS	PGIS	Pervious
OMF North	OMF Site F	17.3	39.3	27.4
	OMF Site F with Lead Tracks to West Side of Airport Road	16.9	38.1	28.0
	OMF Site E	9.7	16.9	70.3
	OMF Site B	23.4	29.4	36.6
	OMF Site B with Lead Tracks to South Side of SR 526 Design Option	25.0	33.8	42.9

Existing stormwater features within 200 feet of the project limits are documented in Table 3-4. The table was created from publicly available data and has not been field verified. Stormwater features were mapped based on aerial imagery. Field verification of stormwater features will occur as design advances and is anticipated to inform the analysis in the Final EIS.

Table 3-4 Existing Stormwater Infrastructure Identified Within Study Area (Project Limits + 200 Feet)

Jurisdiction	Type	Northing	Easting	Unique ID	Facility ID	Subbasin Name	Area (sf)
City of Lynnwood	Detention Pond	NA[a]	NA[a]	NA[a]	NA[a]	NA[a]	82,672
City of Lynnwood	Detention Pond	NA[a]	NA[a]	NA[a]	NA[a]	NA[a]	29,253
City of Lynnwood	Detention Pond	NA[a]	NA[a]	NA[a]	NA[a]	NA[a]	19,289
Snohomish County	Detention Pond	326922.988	1291303.773	AE4682DP	0943	Swamp Creek	1,239
Snohomish County	Detention Pond	330539.3417	1289067.396	AE4501DP	1877	Swamp Creek	1,716
Snohomish County	Detention Pond	321524.1875	1294010.375	AE1260DP	0219	North Creek	689
Snohomish County	Detention Pond	325742.054	1289159.639	AF6231DP	3022	Swamp Creek	2,868
Snohomish County	Detention Pond	325697.9688	1288206.5	AA4298DP	0016	Swamp Creek	725
Snohomish County	Detention Pond	325936.3437	1292144	AC4647DP	2580	Swamp Creek	3,844
Snohomish County	Detention Pond	321506.921	1293854.466	AF5169DP	3724	North Creek	1,127
Snohomish County	Detention Pond	NA[a]	NA[a]	AU071595	2068	Swamp Creek	300
Snohomish County	Detention Pond	327045.9871	1291259.335	AE4166DP	2810	Swamp Creek	2,276
Snohomish County	Detention Pond	NA[a]	NA[a]	AB5115DP	2812	Swamp Creek	4,379
Snohomish County	Detention Pond	NA[a]	NA[a]	AA4296DP	0738	Swamp Creek	1,032
Snohomish County	Detention Pond	NA[a]	NA[a]	AB2964DP	0876	Swamp Creek	918
Snohomish County	Detention Pond	NA[a]	NA[a]	AE2756DP	1993	Swamp Creek	551
Snohomish County	Detention Pond	314651.6251	1290701.875	AB5027DP	0023	Swamp Creek	379
Snohomish County	Detention Pond	NA[a]	NA[a]	AE1259DP	0452	North Creek	1,823
Snohomish County	Detention Pond	325525.387	1288866.173	AU077455	4258	Swamp Creek	1,225
Snohomish County	Detention Pond	NA[a]	NA[a]	AE1340DP	0506	Swamp Creek	1,785
Snohomish County	Detention Pond	317302.326	1292675.329	AU080679	4408	Swamp Creek	3,606
Snohomish County	Detention Pond	NA[a]	NA[a]	AU081580	NA[a]	Swamp Creek	4,027
Snohomish County	Detention Pond	NA[a]	NA[a]	AU081750	NA[a]	Swamp Creek	4,099
Snohomish County	Detention Pond	NA[a]	NA[a]	AU081749	NA[a]	Swamp Creek	3,121
Snohomish County	Detention Pond	NA[a]	NA[a]	AU081748	NA[a]	Swamp Creek	1,013

Jurisdiction	Type	Northing	Easting	Unique ID	Facility ID	Subbasin Name	Area (sf)
Snohomish County	Detention Pond	NA[a]	NA[a]	AU081747	3881	Swamp Creek	1,489
Snohomish County	Detention Pond	NA[a]	NA[a]	AU083273	2791	North Creek	1,610
Snohomish County	NA	NA[a]	NA[a]	NA[a]	0026	NA	1,004
Snohomish County	Detention Pond	323643.602	1294755.978	AU083995	NA[a]	North Creek	391
Snohomish County	Detention Pond	313353.2186	1289658.875	AB2962DP	0025	Swamp Creek	27
Snohomish County	Bioswale	325651.4184	1288223.205	AE8368DP	0016	Swamp Creek	314
Snohomish County	Bioswale	328211.831	1291468.722	AF0097DP	3047	Swamp Creek	175
Snohomish County	Bioswale	313440.6895	1291741.768	AE8288DP	2068	Swamp Creek	274
Snohomish County	Bioswale	313655.8101	1291580.149	AE8289DP	2071	Swamp Creek	113
Snohomish County	Bioswale	314600.8398	1290688.235	AE8667DP	0023	Swamp Creek	221
Snohomish County	Bioswale	313354.3682	1289586.199	AE8670DP	0025	Swamp Creek	8
Snohomish County	Bioinfiltration Cell	314092.323	1290538.8	AU072767	4096	Swamp Creek	49
Snohomish County	Bioswale	326265.9673	1291164.625	AU073731	0005	Swamp Creek	157
Snohomish County	Bioswale	327197.269	1291461.096	AE8896DP	2810	Swamp Creek	611
Snohomish County	Bioinfiltration Cell	325454.4	1288807.424	AU077451	4258	Swamp Creek	365
Snohomish County	Bioswale	321779.6323	1295066.445	AF4368DP	3705	North Creek	79
Snohomish County	Bioswale	NA[a]	NA[a]	6/25/2019	4408	Swamp Creek	256
Snohomish County	Detention Pipe	318528.1344	1293386.155	AE8375DP	1991	Swamp Creek	127
Snohomish County	Detention Pipe	318532.4067	1293285.115	AE8376DP	1991	Swamp Creek	107
Snohomish County	Detention Pipe	313315.7547	1291767.062	AE8386DP	2068	Swamp Creek	90
Snohomish County	Detention Pipe	313481.0405	1291616.039	AE8387DP	2071	Swamp Creek	65
Snohomish County	Vault	327288.837	1290401.426	AU069735	3962	Swamp Creek	987
Snohomish County	Vault	327445.039	1290211.078	AU069736	3962	Swamp Creek	5,162
Snohomish County	Vault	315172.819	1291400.514	AU069688	3004	Swamp Creek	404
Snohomish County	Vault	314872.008	1291029.304	AU069690	3005	Swamp Creek	279
Snohomish County	Vault	315046.431	1291290.892	AU069692	3010	Swamp Creek	256
Snohomish County	Vault	325324.6598	1291817.374	AF2130DP	2560	Swamp Creek	458

Jurisdiction	Type	Northing	Easting	Unique ID	Facility ID	Subbasin Name	Area (sf)
Snohomish County	Vault	313552.695	1292264.822	AF6448DP	2113	Swamp Creek	352
Snohomish County	Vault	316592.493	1292259.356	AF6016DP	2111	Swamp Creek	282
Snohomish County	Vault	327077	1289450	AF3844DP	2511	Swamp Creek	299
Snohomish County	Vault	314673.777	1291730.871	AU069805	2883	Swamp Creek	736
Snohomish County	Detention Pipe	325911.679	1288629.166	AU069837	3281	Swamp Creek	141
Snohomish County	Detention Pipe	324949.453	1293819.576	AU069866	2797	North Creek	103
Snohomish County	Detention Pipe	324987.371	1293776.215	AU069865	2797	North Creek	98
Snohomish County	Vault	320394.598	1293821.173	AU070111	2880	North Creek	346
Snohomish County	Detention Pipe	313101.2	1291430.167	AU070902	2978	Swamp Creek	57
Snohomish County	Detention Pipe	313110.568	1291427.652	AU070903	2978	Swamp Creek	36
Snohomish County	Detention Pipe	327148.14	1289268.66	AU071213	2881	Swamp Creek	106
Snohomish County	Vault	316368.186	1291732.773	AU071948	2509	Swamp Creek	48
Snohomish County	Detention Pipe	318534.3631	1293187.747	AU016657	1991	Swamp Creek	42
Snohomish County	Vault	313714.856	1291645.995	AU072342	4079	Swamp Creek	1,234
Snohomish County	Vault	314007.457	1291754.126	AU072416	2596	Swamp Creek	562
Snohomish County	Detention Pipe	NA[a]	NA[a]	AE8533DP	2510	Swamp Creek	124
Snohomish County	Detention Pipe	NA[a]	NA[a]	AF0096DP	3047	Swamp Creek	67
Snohomish County	Detention Pipe	NA[a]	NA[a]	AF0095DP	3047	Swamp Creek	73
Snohomish County	Detention Pipe	NA[a]	NA[a]	AF0094DP	3047	Swamp Creek	71
Snohomish County	Detention Pipe	313512.8709	1291561.499	AE8379DP	2071	Swamp Creek	34
Snohomish County	Detention Pipe	336318.0289	1287671.808	AE8220DP	1006	Swamp Creek	260
Snohomish County	Detention Pipe	328028.4469	1289571.639	AE9102DP	2576	Swamp Creek	110
Snohomish County	Vault	312934.2138	1290259.469	AU069864	3161	Swamp Creek	120
Snohomish County	Vault	320763	1293790	AF5491DP	3539	North Creek	320
Snohomish County	Vault	NA[a]	NA[a]	AU070134	3887	Swamp Creek	535
Snohomish County	Detention Pipe	311940.2467	1290847.267	AF3861DP	1490	Swamp Creek	135
Snohomish County	Detention Pipe	311836.8114	1290841.514	AF3862DP	1490	Swamp Creek	152

Jurisdiction	Type	Northing	Easting	Unique ID	Facility ID	Subbasin Name	Area (sf)
Snohomish County	Detention Pipe	311736.1697	1290842.926	AF3863DP	1490	Swamp Creek	164
Snohomish County	Vault	NA[a]	NA[a]	AU075660	3716	Swamp Creek	1,090
Snohomish County	Detention Pipe	NA[a]	NA[a]	AG8402CB	4220	Swamp Creek	184
Snohomish County	Detention Pipe	316396.1538	1292190.788	AE8542DP	4107	Swamp Creek	337
Snohomish County	Detention Pipe	316530.0127	1292158.176	AE8543DP	4107	Swamp Creek	222
Snohomish County	Vault	316738.353	1292178.926	AF6263DP	3837	Swamp Creek	312
Snohomish County	Vault	329114.694	1289524.607	AU070824	4011	Swamp Creek	385
Snohomish County	Vault	NA[a]	NA[a]	AU069689	3006	Swamp Creek	501
Snohomish County	Vault	NA[a]	NA[a]	AU071506	3953	Swamp Creek	2
Snohomish County	Vault	NA[a]	NA[a]	AU069758	4033	Swamp Creek	1,558
Snohomish County	Vault	315428.632	1292622.224	AU077424	4191	Swamp Creek	19
Snohomish County	Detention Pipe	NA[a]	NA[a]	AU077939	0944	North Creek	119
Snohomish County	Detention Pipe	NA[a]	NA[a]	AU077940	0945	Swamp Creek	474
Snohomish County	Vault	316076.202	1291766.277	AU070489	4059	Swamp Creek	79
Snohomish County	Detention Pipe	NA[a]	NA[a]	AU079646	3088	Swamp Creek	0
Snohomish County	Rock Gallery	328784.581	1289695.269	AU079788	4399	Swamp Creek	139
Snohomish County	Vault	NA[a]	NA[a]	AU082309	NA[a]	Swamp Creek	304
Snohomish County	Vault	NA[a]	NA[a]	AU082312	NA[a]	Swamp Creek	304
Snohomish County	Vault	NA[a]	NA[a]	AU082542	NA[a]	Swamp Creek	304
City of Everett	Detention Pond	328147.3438	1290928.375	AE0082DP	NA[a]	Swamp Creek	725
City of Everett	Detention Pond	328151.8127	1290790.375	AE0083DP	NA[a]	Swamp Creek	848

SOURCES: City of Everett GIS Data (2023b), City of Lynnwood GIS Data (2024), Snohomish County Drainage Inventory Interactive Map and Data (2023b).
NOTE:

a) "NA" means "Not Available". It is unknown why the sources are missing these data.

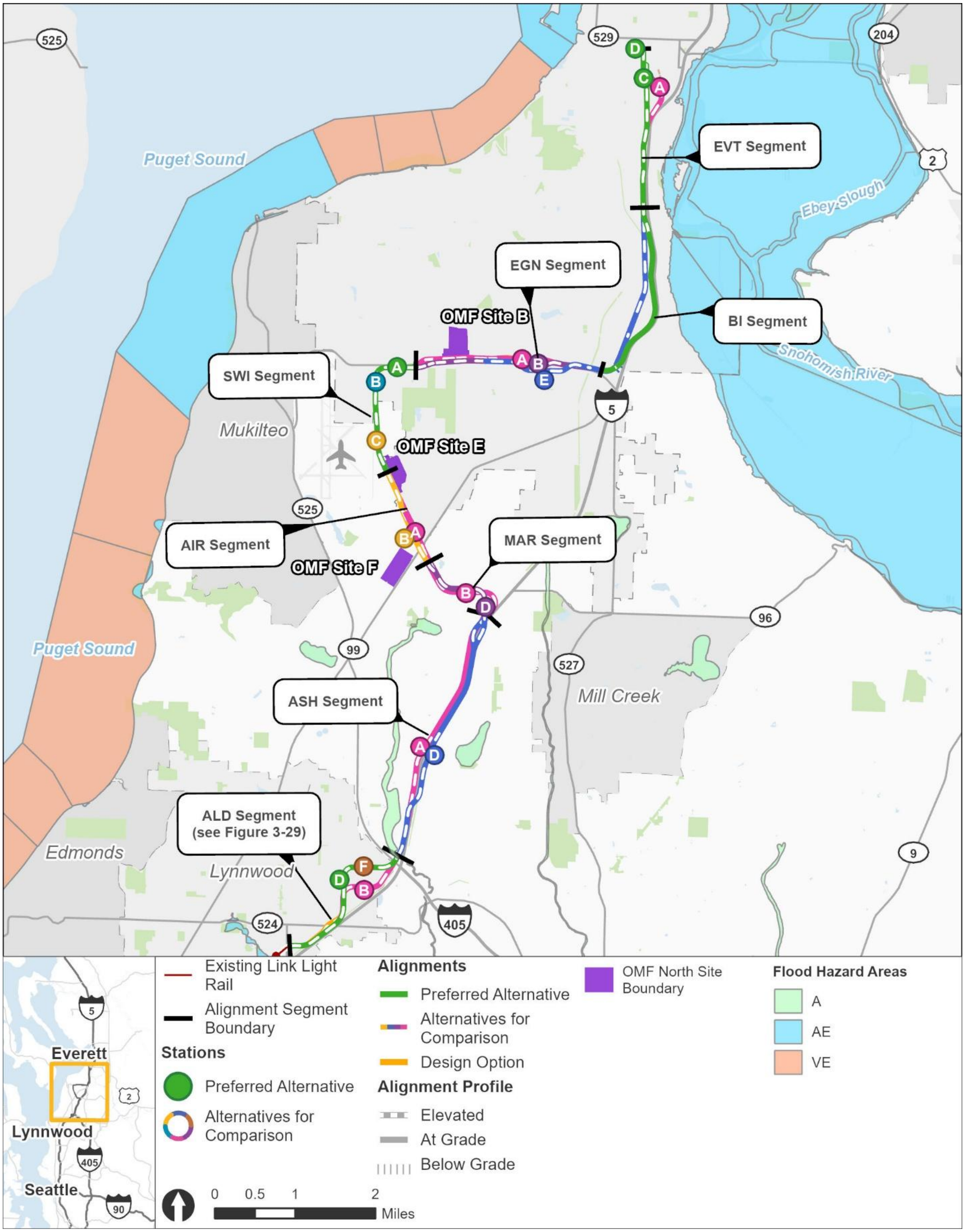
3.3 Shorelines

No designated Shorelines of the State exist within the study area.

3.4 Floodplains and Floodways

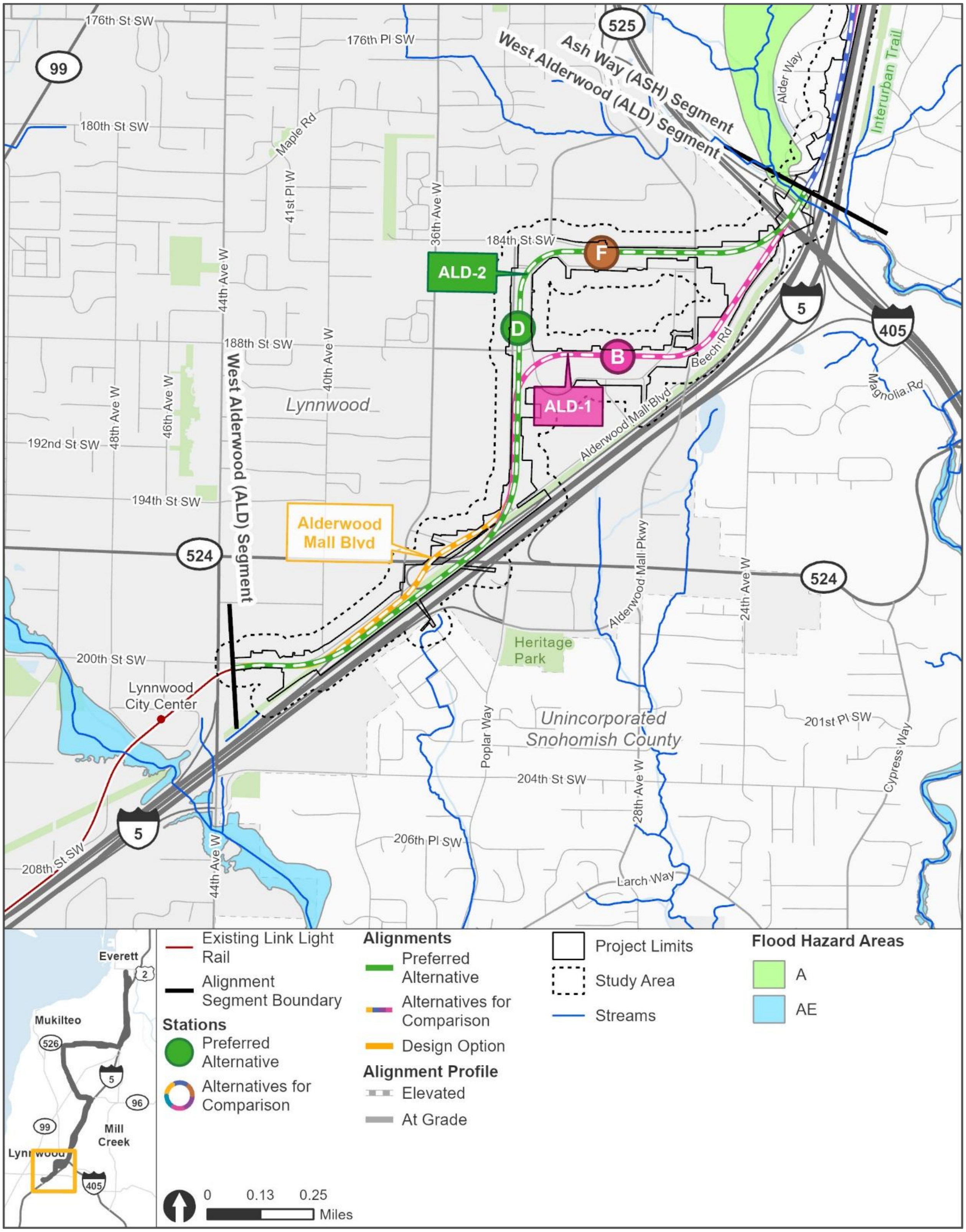
One FEMA-delineated floodplain is present in the study area and within 200 feet of the project limits. The floodplain is located in the West Alderwood Segment and is associated with Swamp Creek (Figure 3-28 and Figure 3-29). At the north end of the West Alderwood Segment, the floodplain is delineated as a Zone A floodplain (no base flood elevations determined). The Swamp Creek floodplain continues downstream, across I-5, and transitions to a Zone AE floodplain (base flood elevations have been determined). Zone VE areas are not mapped within the study area but are shown on Figure 3-28 for reference.

Figure 3-28 FEMA Flood Hazard Areas for Full Project Corridor



SOURCE: Snohomish County (2023).

Figure 3-29 FEMA Flood Hazard Areas – West Alderwood Segment



SOURCE: Snohomish County (2023).

3.5 Groundwater

High groundwater elevations are important for supporting the hydrologic functions of streams and wetlands (Harman et. al. 2012). Existing commercial, industrial, and residential land uses in the study area have altered the groundwater-surface water interface and exchange. Paved areas reduce infiltration of stormwater and can adversely affect aquifer recharge potential. Additionally, drainage infrastructure, which may detain then discharge surface water rather than allowing infiltration, along with the withdrawal of water from wells, can further reduce groundwater recharge and lower local groundwater elevations. For these primary reasons, there are fewer locations where groundwater seepage may be observed.

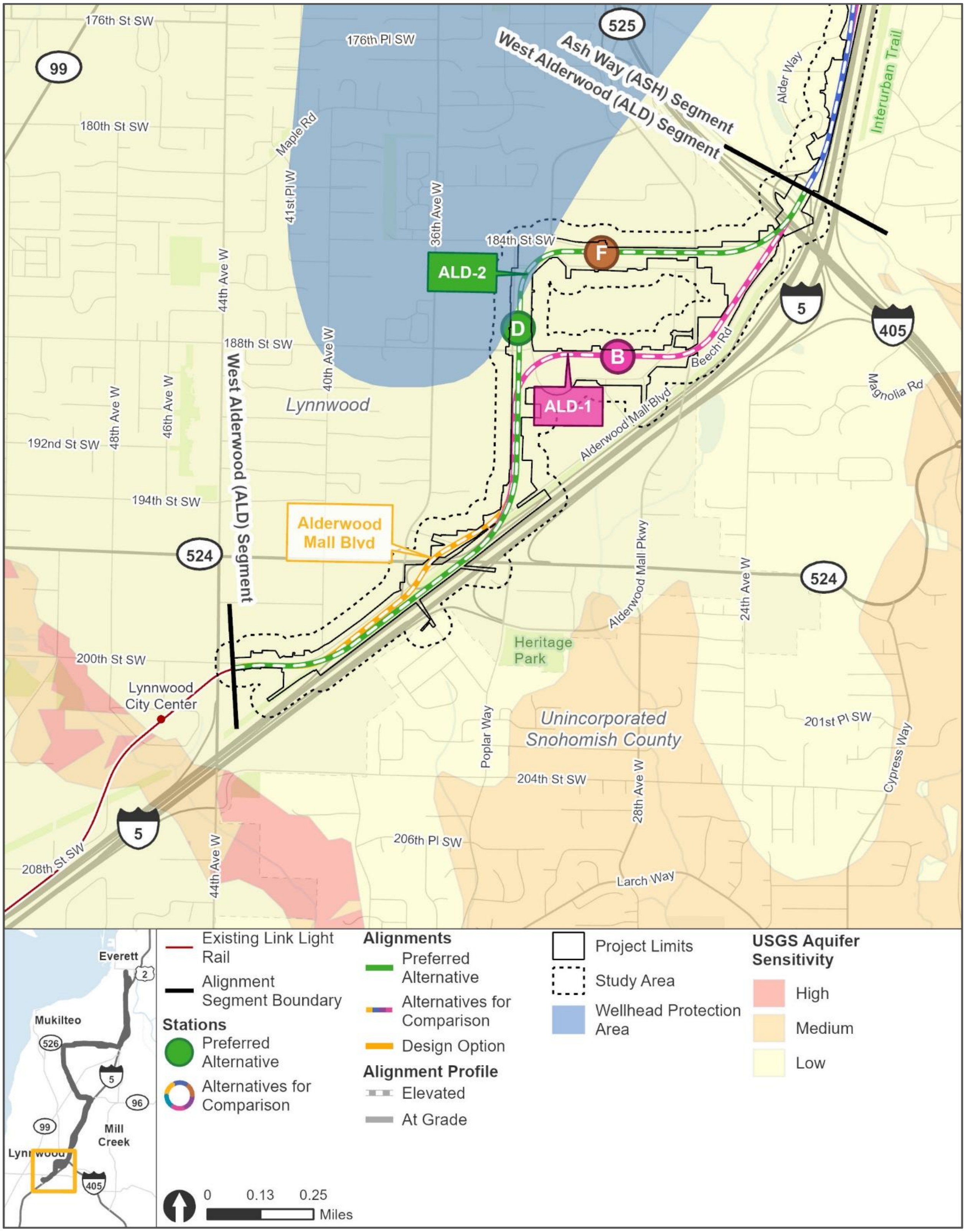
According to the PDS Map Portal and the EPA, there are no sole source aquifers within the project study area (Snohomish County 2024b; EPA 2023).

There is one wellhead protection area identified as the 164th Street Artesian Well (WSDH 2024), also known as Well No. 5 (Snohomish County 2016). This wellhead protection area is shown in Figure 3-30 and Figure 3-31, within the study area in the West Alderwood Segment. It has the Ecology Tag Number AGB598. According to available information, the 164th Street Artesian Well is cased to approximately 120 feet deep and classified as a Group A transient non-community well (WSDH 2024).

One industrial, private wellhouse was identified within OMF Site B as shown in Figure 3-35 and Figure 3-36. According to a Snohomish County well water report titled Permit No. G1-21297P, this well has a 10-inch casing and is 230-feet deep (Richard Well Drilling Co. 1976). No unmapped wells were identified during the site reconnaissance.

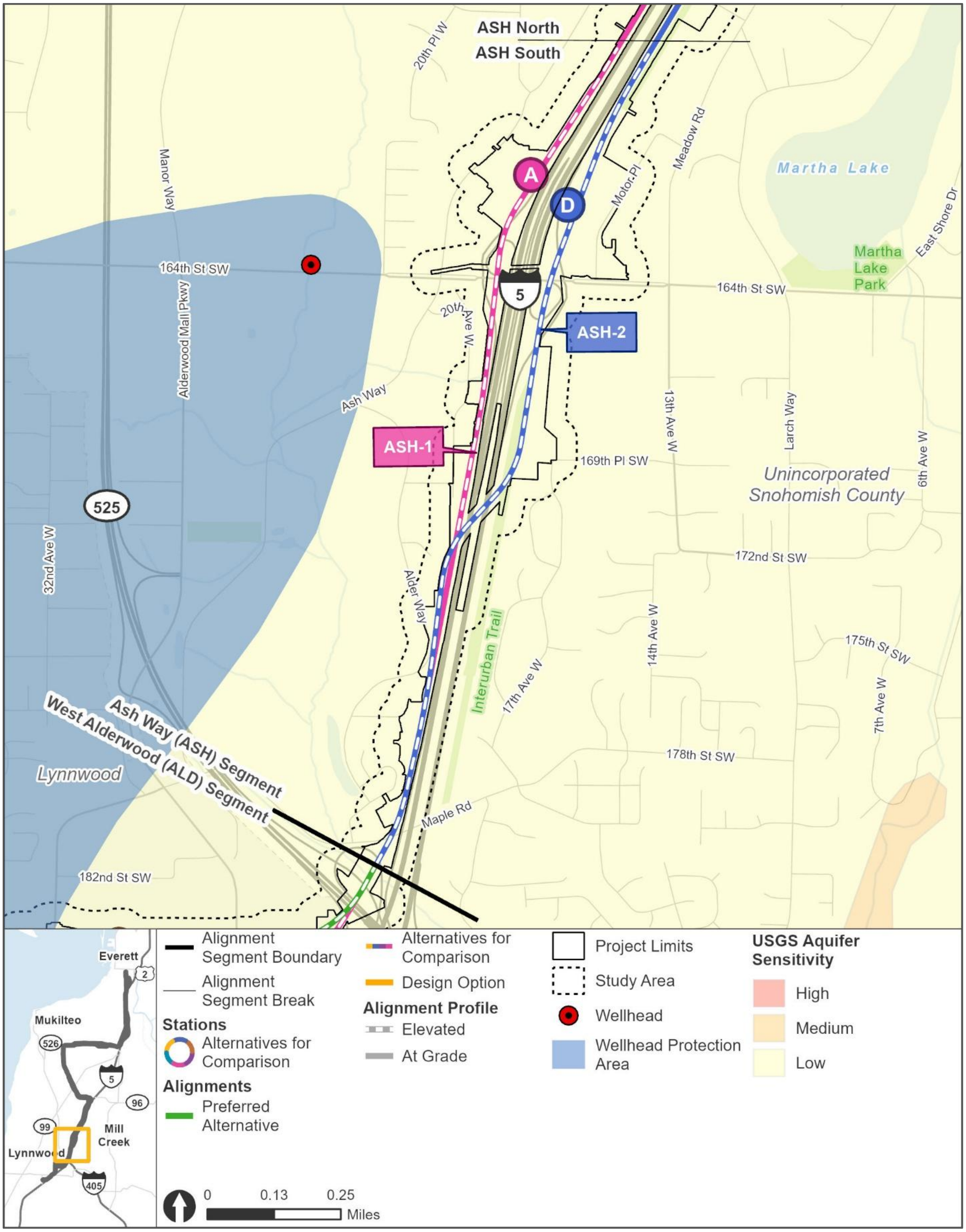
CARAs are shown in Figure 3-30 through Figure 3-41. While most of the project study area has low sensitivity to groundwater contamination, pockets of medium aquifer sensitivity are located in the Broadway/I-5 Segment and Everett Station Segment.

Figure 3-30 Critical Aquifer Recharge Areas – West Alderwood Segment



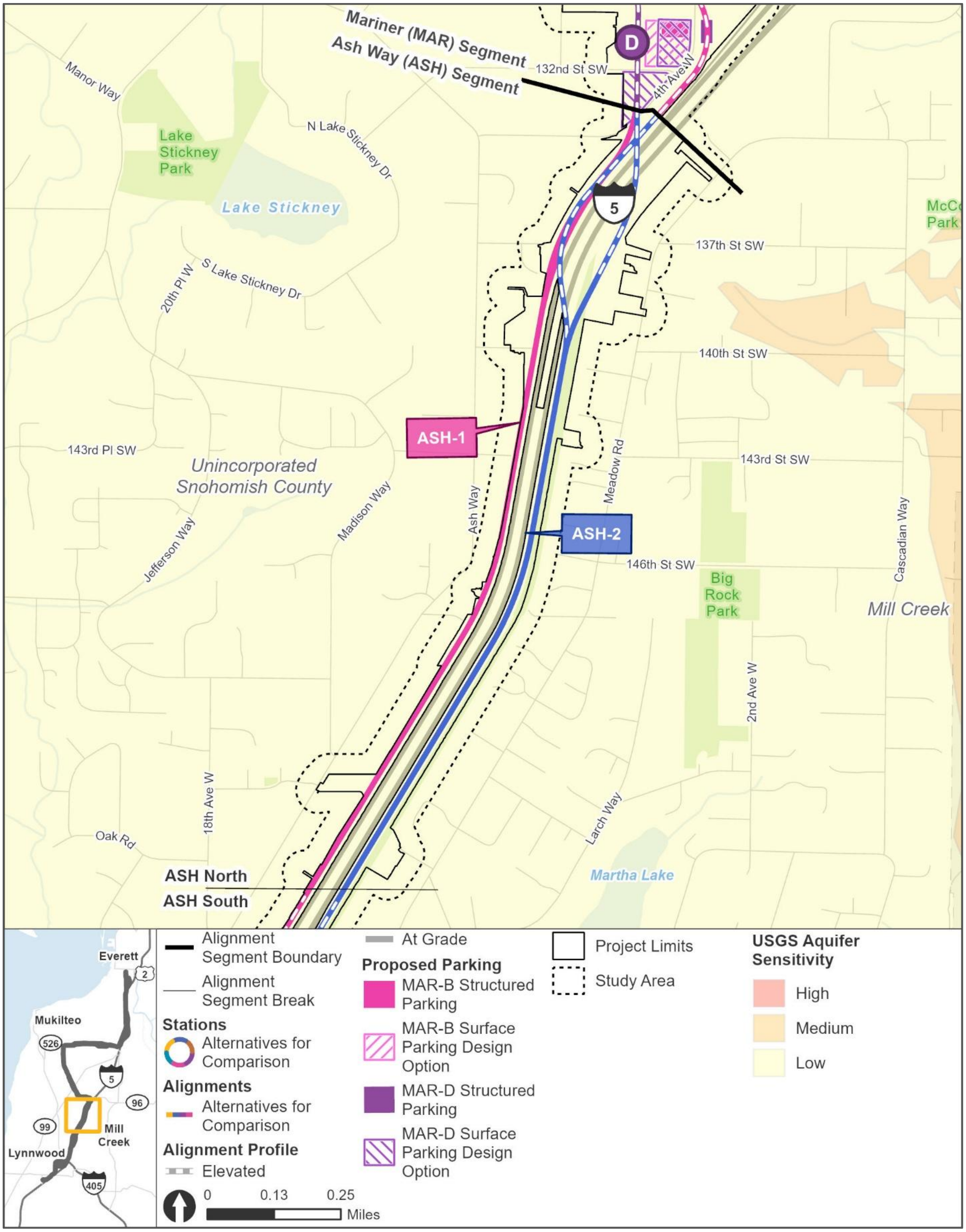
SOURCE: Snohomish County (2023).

Figure 3-31 Critical Aquifer Recharge Areas – Ash Way Segment (South)



SOURCE: Snohomish County (2023).

Figure 3-32 Critical Aquifer Recharge Areas – Ash Way Segment (North)

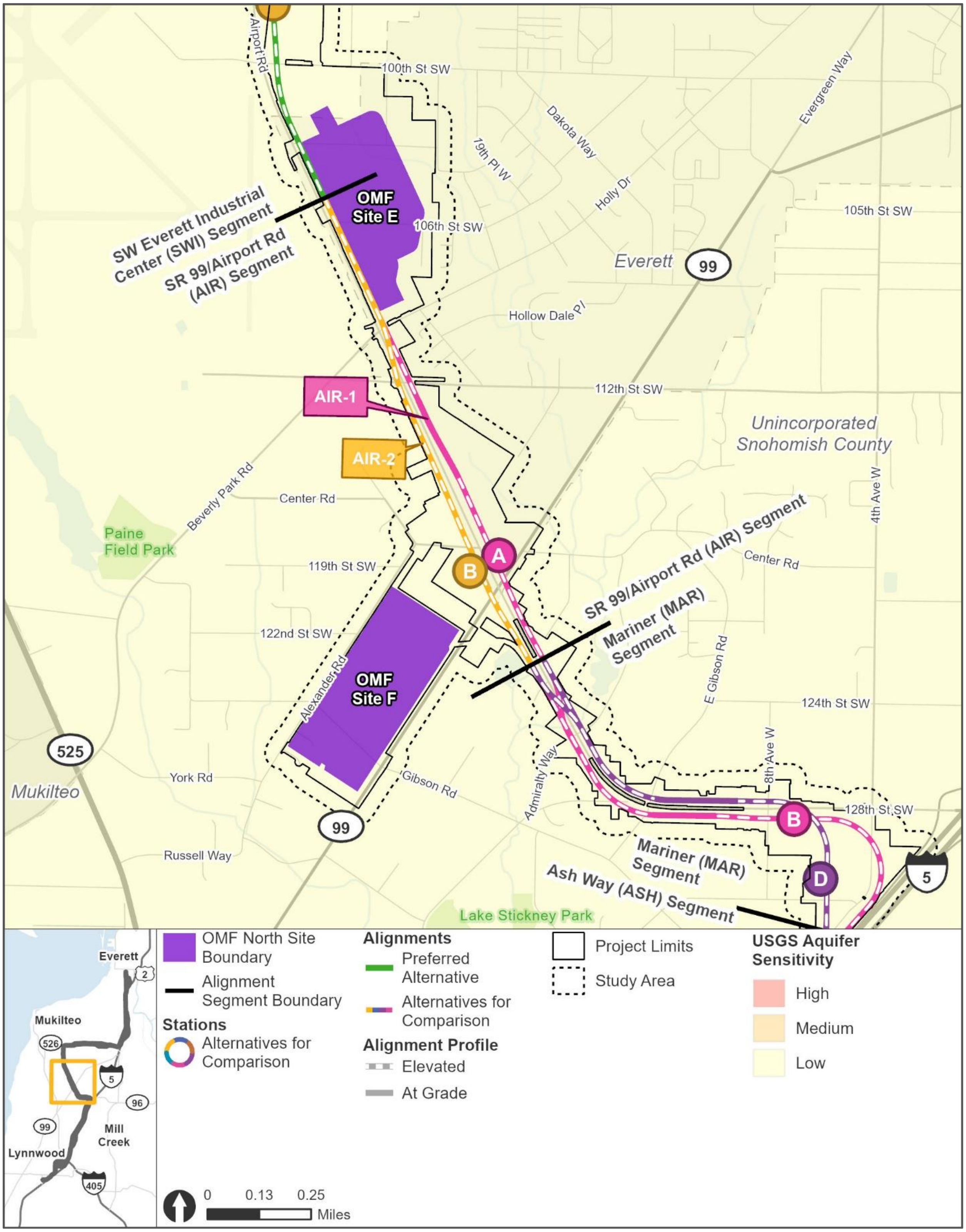


SOURCE: Snohomish County (2023) and DNR (2024).

Figure 3-33 Critical Aquifer Recharge Areas – Mariner Segment

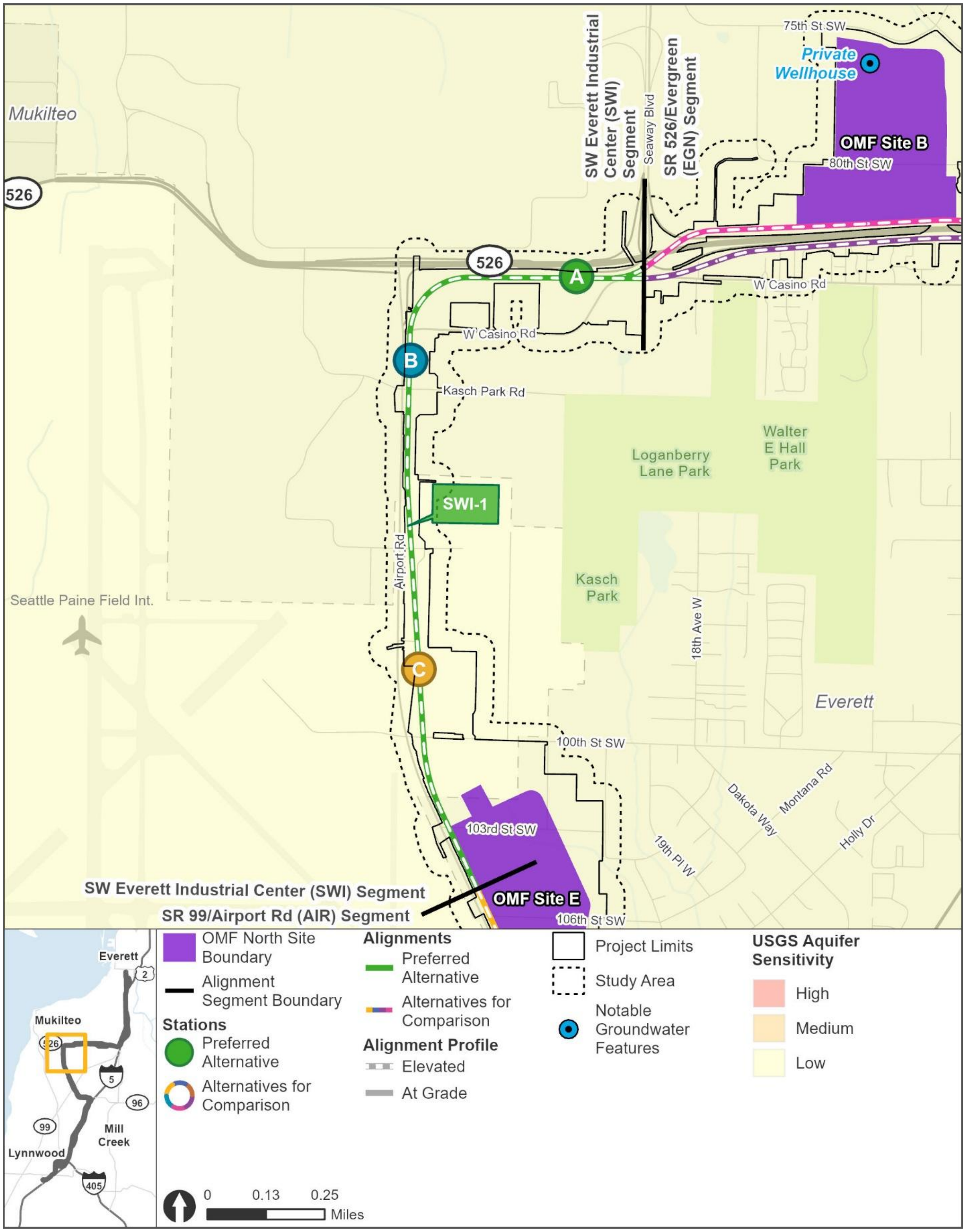
SOURCE: Snohomish County (2023) and DNR (2024).

Figure 3-34 Critical Aquifer Recharge Areas – SR 99/Airport Road Segment and OMF Sites F and E



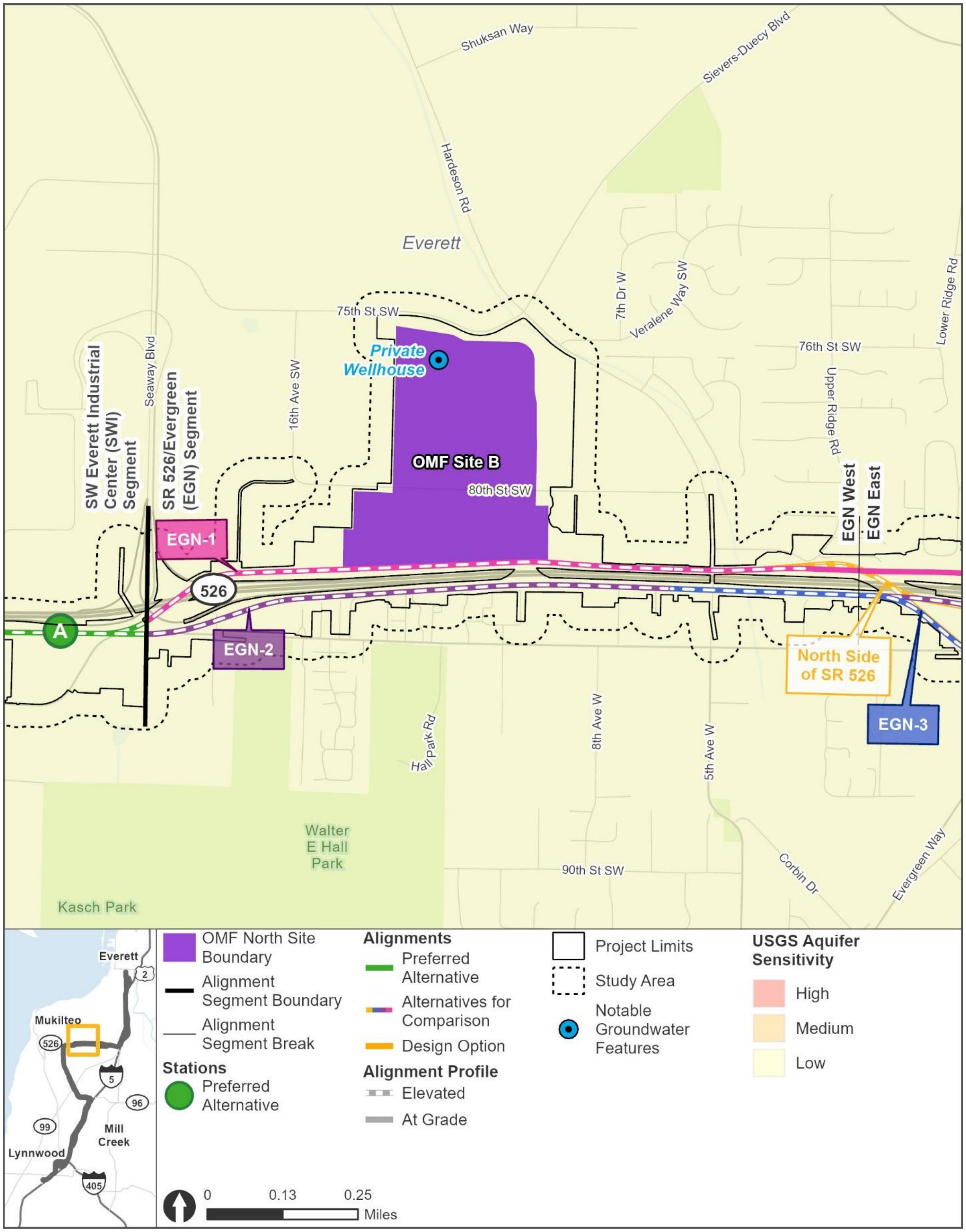
SOURCE: Snohomish County (2023) and DNR (2024).

Figure 3-35 Critical Aquifer Recharge Areas – SW Everett Industrial Center Segment and OMF Site E



SOURCE: Snohomish County (2023) and DNR (2024).

Figure 3-36 Critical Aquifer Recharge Areas – SR 526/Evergreen Segment (West) and OMF Site B

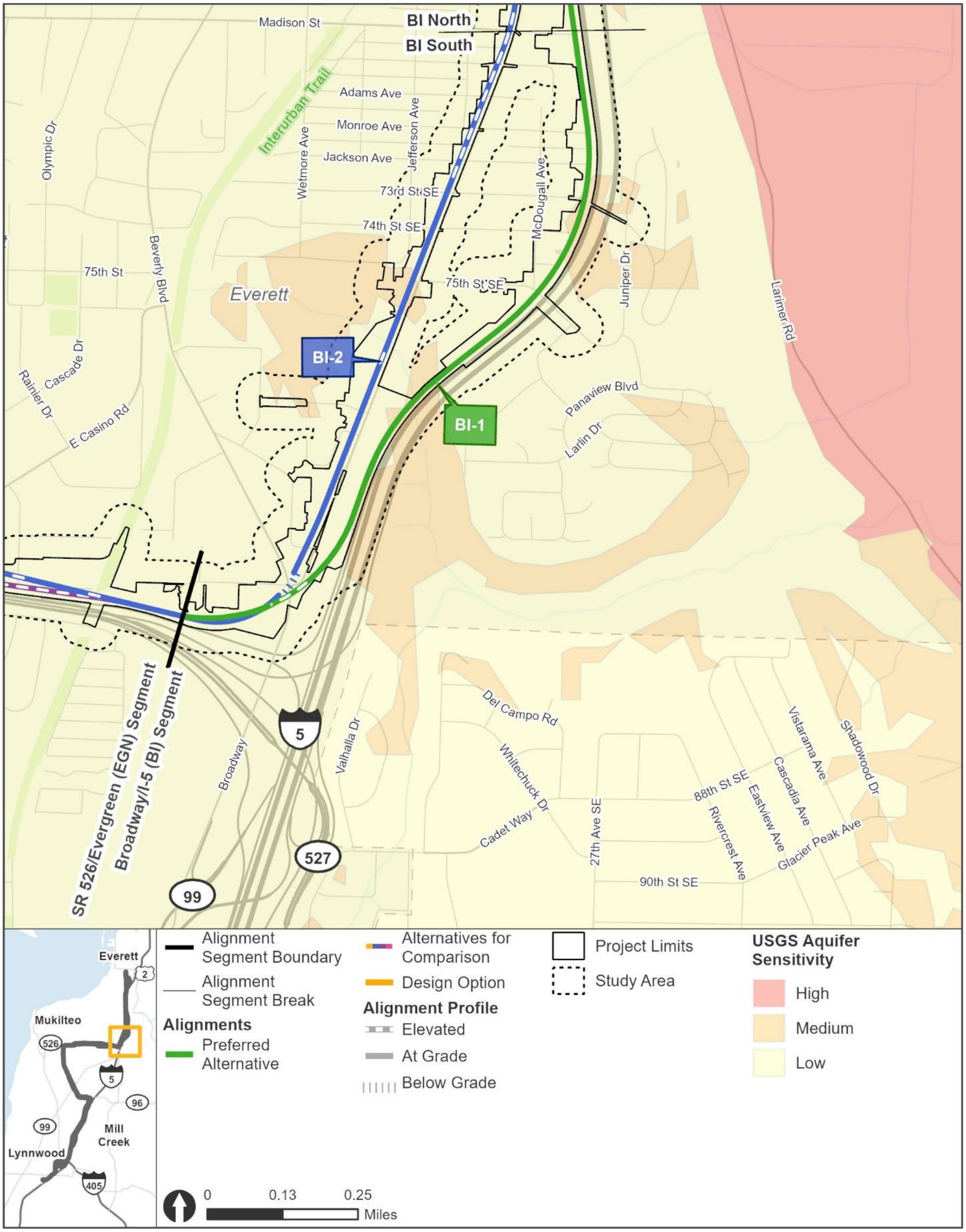


SOURCE: Snohomish County (2023).

Figure 3-37 Critical Aquifer Recharge Areas – SR 526/Evergreen Segment (East)

SOURCE: Snohomish County (2023).

Figure 3-38 Critical Aquifer Recharge Areas – Broadway/I-5 Segment (South)

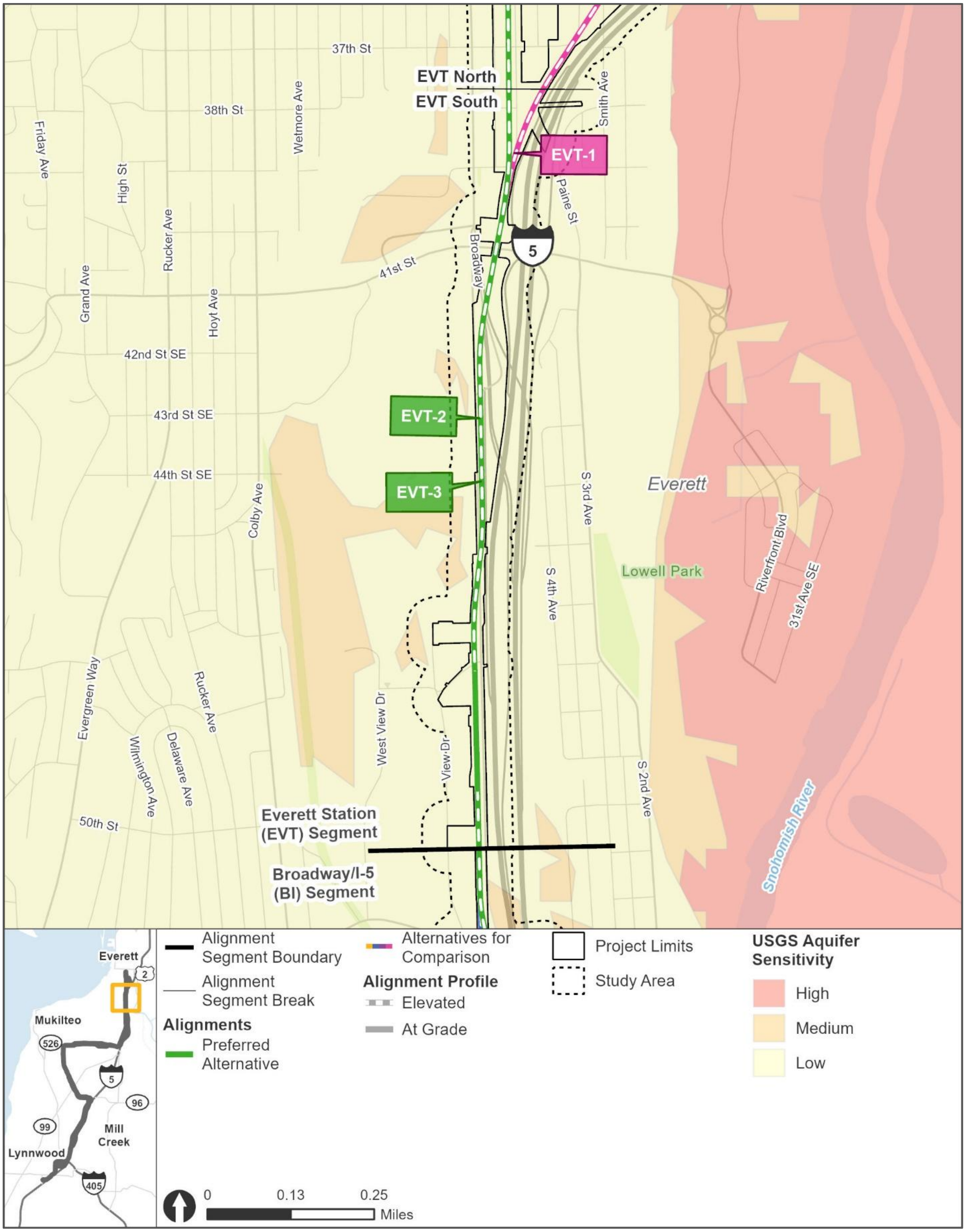


SOURCE: Snohomish County (2023).

Figure 3-39 Critical Aquifer Recharge Areas – Broadway/I-5 Segment (North)

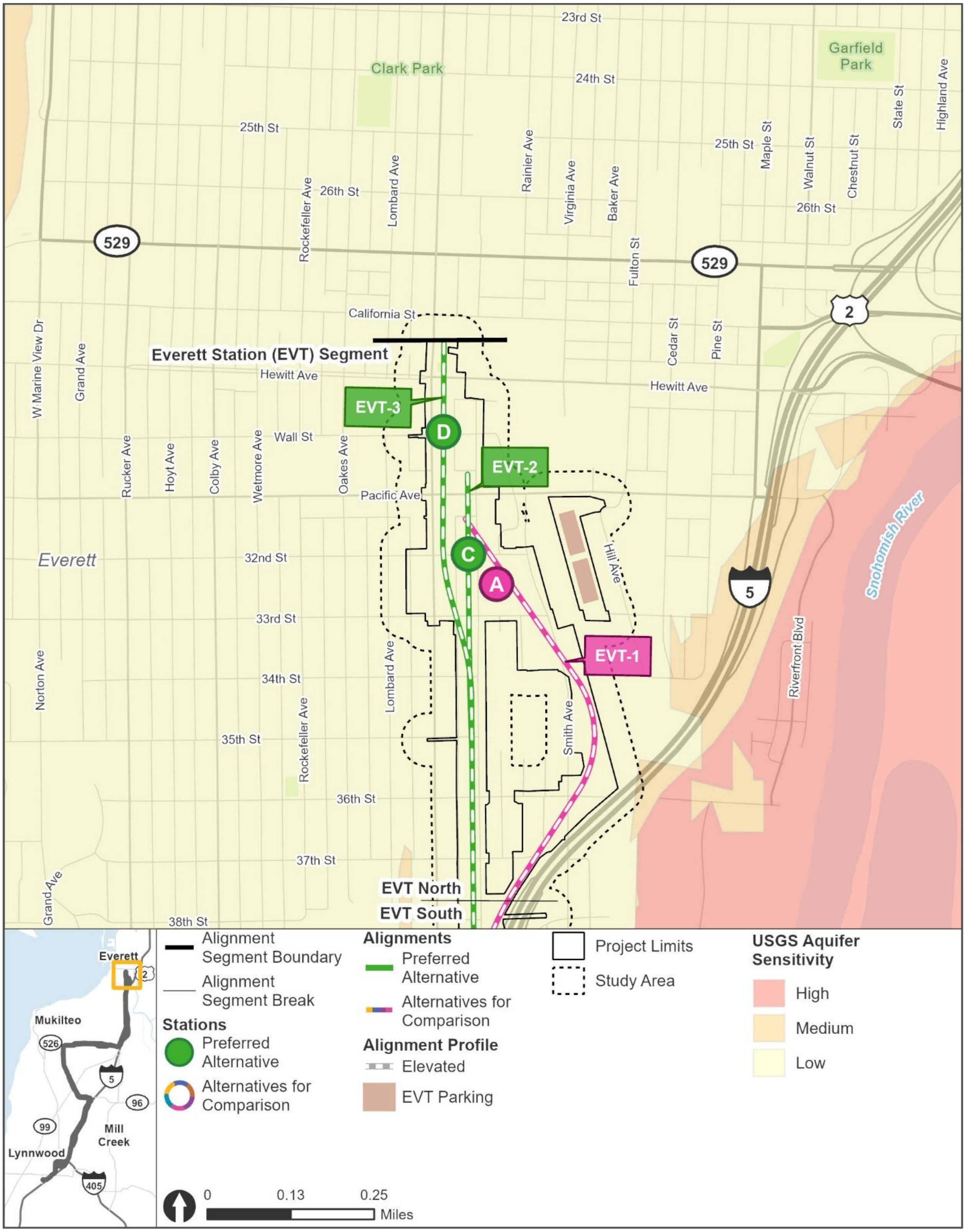
SOURCE: Snohomish County (2023).

Figure 3-40 Critical Aquifer Recharge Areas – Everett Station Segment (South)



SOURCE: Snohomish County (2023).

Figure 3-41 Critical Aquifer Recharge Areas – Everett Station Segment (North)



SOURCE: Snohomish County (2023).

4 ENVIRONMENTAL IMPACTS

This impact analysis assesses the potential operational and construction impacts the Build Alternatives would have on existing open channel streams, water crossings, stormwater infrastructure, floodplains, groundwater recharge, and soil infiltration capabilities. It characterizes the type, duration, and extent of impacts associated with each alignment/station and OMF North site alternative based on the conceptual design drawings included in Draft EIS Appendix F. Impacts are quantified where feasible and are subject to change as the design advances. The No Build Alternative analysis assesses the impacts that would or would not occur should the project not be constructed. A comprehensive list of differences in impacts between Build Alternatives is contained in Table 4-2 through Table 4-10.

4.1 Build Alternatives

4.1.1 Operational Impacts

This assessment of operational impacts captures how the constructed project’s changes in grade or impervious surface areas, or changed land use, would likely alter existing basin hydrology, water conveyance and retention, runoff rates, infiltration, and water quality for the life of the project.

4.1.1.1 Impacts Common to All Build Alternatives

Surface Water

Guideway columns and other infrastructure are proposed within study area streams, wetlands, and their buffers. This placement has potential to adversely affect floodplain storage, quality of surface waters (especially during construction as described in Section 4.1.1.4), and availability and quality of wildlife habitat in and along waterbodies. See the Ecosystems Technical Report in Draft EIS Appendix G.10 for details on the potential ecological impacts of the proposed project components.

Where water crossings are replaced under the guideway, there would be a reduced incentive and greater cost barrier to fully restoring the stream. Full restoration could look like removing structures entirely and returning the stream to the surface. This is known as stream daylighting. The scale and cost of infrastructure being constructed means that any future attempts to more fully restore a stream (i.e., daylight the stream being conveyed by an underground structure) would be costly and perhaps impracticable due to proposed light rail infrastructure, especially if at-grade.

Stormwater

Stormwater from PGIS can carry pollutants into receiving surface waters. Common forms of pollution from PGIS within the study area could include suspended sediments, turbidity, excess nutrients, metals, fossil fuel derived hydrocarbons, pathogens, and 6PPD-quinone (6PPD-q). Runoff from PGIS is also associated with increased water temperatures. When runoff from precipitation washes chemicals off roads and parking lots into streams during salmon runs, it is lethal to spawning adult coho (Ecology 2024b). The contaminant 6PPD-q, which is the result of 6PPD from tire dust oxidizing to 6PPD-q when it is exposed to air, is of specific importance as it is very toxic to some fish even at low concentrations.

Where existing stormwater infrastructure is not up to current design standards and would be updated by the project through adherence to stormwater guidance referenced in Section 2, post-construction conditions could have a beneficial effect on water quality and attenuation. Where PGIS is being reduced (Table 4-1), a reduction in pollutant loading into receiving waters could also be expected, including reductions in releases of 6PPD-q. Stormwater attenuation is the practice of reducing the rate of stormwater runoff released into water conveyances, streams, and rivers to simulate pre-developed conditions. In general, current stormwater standards require projects to meet pre-development discharge rates through attenuation via methods such as storage vaults or detention ponds. These features temporarily store stormwater and release it at a rate designed to reduce adverse impacts to the peak flow of receiving water conveyances. The result of project operation would be that stormwater runoff rates in affected areas would likely decrease over existing conditions, with a lowered peak flow rate for receiving waters and an extended period of high flow. Artificially high peak flow rates in streams and rivers can cause a multitude of impacts. Increased velocity within the channel and upstream and downstream of water crossing structures (culverts) causes higher rates of scour and erosion. Excessive scour can undermine and destabilize structures causing damage, which leads to increased maintenance requirements and flood risk. Artificially high velocities also reduce the amount of refuge (resting areas with low velocity) for fish during flood events.

Where filtration is required for new or replaced PGIS, the quality of stormwater discharge from project areas may see improvement over discharge from untreated existing impervious surface areas with removal or lowering of pollutant levels. For example, OMF Site F would replace more impervious surfaces within the study area compared to OMF Site E (Table 4-1); therefore, excluding recently constructed projects within the study limits, OMF Site F would have a higher beneficial impact in terms of stormwater as it would bring areas built under older stormwater codes up to modern standards. Current local codes have higher standards for water quality and attenuation than older codes.

Where the project would replace existing pervious surface areas with impervious surfaces, basin hydrology would likely be altered, opportunities for infiltration of stormwater would be reduced, and runoff flow paths and discharge locations could change. Streams, wetlands, and lakes whose hydrology is driven by local groundwater tables could experience a reduction in hydrologic function, with reduced groundwater inflow and potential associated changes in water levels and quality. Where runoff flow paths would be altered by the conversion of pervious surfaces into impervious surfaces, water quality could be impacted because stormwater infiltrating through soil removes some pollution and reduces water temperature. For example, OMF Site B would increase the amount of impervious surface compared to OMF Site F (Table 4-1). This would lead to decreased opportunities for stormwater infiltration and could have an adverse impact on local stream and wetland hydrology. For additional information concerning impacts to existing vegetation, wildlife, wetlands, and streams, see the Ecosystems Technical Report in Draft EIS Appendix G.10.

Table 4-1 Proposed Change in Surface Cover Type

Alignment Segment / OMF	Alternative	Change in Surface Cover Type (acres)[a]		
		NPGIS	PGIS	Pervious
West Alderwood	ALD-1B	9.6	-6.1	-3.5
	ALD-1B with Alderwood Mall Boulevard Design Option	9.8	-6.0	-3.8
	ALD-2D	9.5	-6.7	-2.8
	ALD-2D with Alderwood Mall Boulevard Design Option	9.8	-6.4	-3.4
	ALD-2F	9.6	-5.9	-3.7
	ALD-2F with Alderwood Mall Boulevard Design Option	9.9	-6.1	-3.8
Ash Way	ASH-1A	15.3	-1.3	-14.0
	ASH-2D	18.8	4.1	-22.9
Mariner	MAR-1B[b]	10.1	-4.0	-6.0
	MAR-1B with Surface Parking Design Option	9.0	-2.8	-6.2
	MAR-2D	6.4	-1.4	-5.0
	MAR-2D with Surface Parking Design Option	4.8	0.9	-5.7
SR 99/Airport Road	AIR-1A	6.6	-2.4	-4.2
	AIR-2B	5.5	-1.2	-4.3
SW Everett Industrial Center	SWI-1A	9.1	-3.0	-6.1
	SWI-1A with Lower Design Option	11.6	-4.2	-7.4
	SWI-1B	8.8	-2.4	-6.4
	SWI-1C	12.0	-4.2	-7.8
SR 526/Evergreen	EGN-1A	11.6	-1.4	-10.2
	EGN-2B	9.8	-3.2	-6.6
	EGN-2B with North Side of SR 526 Design Option	11.1	-3.3	-7.8
	EGN-3E	9.5	-3.2	-6.3
	EGN-3E with North Side of SR 526 Design Option	11.2	-3.2	-8.0
Broadway/I-5	BI-1	10.0	0.2	-10.2
	BI-2	10.1	-2.0	-8.1
Everett Station	EVT-1A	7.3	-2.7	-4.6
	EVT-2C	7.7	-3.6	-4.1
	EVT-3D	8.1	-4.0	-4.1

Alignment Segment / OMF	Alternative	Change in Surface Cover Type (acres)[a]		
		NPGIS	PGIS	Pervious
OMF Sites	OMF Site F	22.7	-16.4	-6.3
	OMF Site F with Lead Tracks to West Side of Airport Road	23.9	-16.0	-7.9
	OMF Site E	26.6	-6.3	-20.3
	OMF Site B	14.2	-7.8	-6.4
	OMF Site B with Lead Tracks to South Side of SR 526 Design Option	15.5	-8.2	-7.3

NOTE:

a) Table values represent the total amount of area converted to a different land cover type based on proposed conditions.

b) Impacts have been rounded to the nearest tenth. Totals may not appear to add up due to rounding.

The EVLE Project would reduce vehicular use in the region by providing an efficient alternative and increase development near the stations due to the increased transit connectivity. Reduced vehicle use would decrease vehicle-related stormwater pollutants and increasing development near stations would reduce development pressure and associated increases in stormwater runoff and impacts to water quality in undeveloped and lesser developed portions of the watershed. The redevelopment of existing impervious areas could improve water quality near light rail stations as new development projects would need to adhere to modern design standards and add improved stormwater management facilities.

Floodplains and Floodways

All West Alderwood Build Alternatives cross the Swamp Creek FEMA-regulated floodplain. Fill or structures placed within the floodplain would decrease flow conveyance and floodplain storage. This could increase flood elevations and flooded areas, exacerbating local problems with flood impacts.

Some streams being conveyed through water crossing structures under proposed light rail infrastructure could benefit ecologically from having a restored functional, non-regulatory floodplain. Restoring historically lost floodplains and riparian areas adjacent to these streams could be cost prohibitive once light rail infrastructure has been constructed over them. Where the guideway is elevated, floodplain restoration activities would be more feasible than where guideway is at-grade.

Groundwater

Where the project increases impervious surfaces areas and decreases the natural infiltration patterns of rain and stormwater runoff, groundwater elevations could be lowered locally.

Areas adjacent to light rail stations often develop and densify rapidly as the value of the land increases. Increases in development often lead to more impervious surface and less undeveloped land. This would decrease the amount of rainfall and stormwater naturally infiltrating into the ground and could reduce aquifer recharge, leading to lower groundwater tables.

4.1.1.2 Alignment and Station Alternatives

The project alternatives located in highly developed areas consist mostly of residential, commercial, and light industrial land uses. Locating the guideway in existing commercial and industrial areas would likely result in no net change to impervious area, as the guideway impervious area would be placed over existing impervious areas. For example, Alternative EGN-2B would be located in more commercial/industrial areas than Alternative EGN-1A and therefore would convert less pervious surface to impervious surface, as shown in Table 4-1. Low to mid-density residential areas typically have more pervious area when compared to commercial and industrial areas; therefore, the project may increase impervious surface area where the guideway or stations are located in residential neighborhoods. There are no substantial differences in impacts between alternatives located in WSDOT right-of-way.

An at-grade guideway has potential for greater impacts on water resources than an aerial guideway due to greater conversions of pervious surfaces to impervious surfaces. Where at-grade guideway may overlay existing green space, the guideway would eliminate the underlying soil's infiltration capacity for water quality treatment and potential groundwater recharge. Aerial guideway can maintain some vegetation and native soils between the guideway columns, which can capture, infiltrate, and treat stormwater runoff. For example, Alternative SWI-1A with Lower Design Option would include sections of at-grade tracks and the other three alternatives in this segment would be entirely elevated, which eliminates opportunities to maintain pervious surfaces and plantings between the guideway columns.

Most of the Build Alternatives would have aerial guideway and therefore pose fewer impacts than if most of the project were at-grade. Aerial guideway columns would be strategically spaced to impact fewer water crossings versus using at-grade guideway. Where the project would remove trees and other vegetation, stormwater runoff could increase as well as pollution associated with stormwater runoff. When vegetated stream buffers are impacted, stream channels are less buffered from pollution as the soils and vegetation reduce stormwater runoff and pollutants before it enters the stream. Table 4-2 through Table 4-9 summarize the impacts for each alternative by alignment segment.

Table 4-2 Operational Impacts to Water Resources – West Alderwood Segment

Build Alternative	Water Resource Impacted	Impacts
ALD-1B	• Stormwater[a] • Floodplain[b] • Groundwater	• Removes more trees than ALD-2D or ALD-2F; this would increase stormwater runoff and associated pollutants. • One guideway column in the floodplain would add fill and reduce flood conveyance.
ALD-1B with Alderwood Mall Boulevard Design Option	• Stormwater[a] • Floodplain[b] • Groundwater	• Removes more trees than ALD-2D or ALD-2F; this would increase stormwater runoff and associated pollutants. • One guideway column in the floodplain would add fill and reduce flood conveyance. • Locates aerial guideway over an existing stormwater pond with two guideway columns placed in the pond.
ALD-2D	• Stormwater[a] • Floodplain[b] • Groundwater	• One guideway column in the floodplain would add fill and reduce flood conveyance. • Would cross into WPZ; no impacts anticipated from aerial guideway because it is not considered to be pollutant-generating.

Build Alternative	Water Resource Impacted	Impacts
ALD-2D with Alderwood Mall Boulevard Design Option	• Stormwater[a] • Floodplain[b] • Groundwater	• One guideway column in the floodplain would add fill and reduce flood conveyance. • Locates aerial guideway over an existing stormwater pond with two guideway columns placed in the pond.
ALD-2F	• Stormwater[a] • Floodplain[b] • Groundwater	• One guideway column in the floodplain would add fill and reduce flood conveyance. • Would cross into WPZ; no impacts anticipated from aerial guideway because it is not considered to be pollutant-generating.
ALD-2F with Alderwood Mall Boulevard Design Option	• Stormwater[a] • Floodplain[b] • Groundwater	• One guideway column in the floodplain would add fill and reduce flood conveyance. • Locates aerial guideway over an existing stormwater pond with two guideway columns placed in the pond.

NOTES:

a) All alternatives could adversely impact stormwater or stormwater infrastructure if mitigation were not provided.

b) Mitigation is required for adding fill to a FEMA regulated floodplain

Table 4-3 Operational Impacts to Water Resources – Ash Way Segment

Build Alternative	Water Resource Impacted	Impacts
ASH-1A	• Surface Water • Stormwater[a] • Groundwater	• More at-grade guideway would produce more stormwater runoff and associated pollution than ASH-D. • May need to replace two existing stream culverts. A new culvert is likely to be larger than existing and increase conveyance capacity. • Would impact less stream buffer vegetation than ASH-D. Impacting stream buffers can affect hydrology and water quality.
ASH-2D	• Surface Water • Stormwater[a] • Groundwater	• More elevated guideway would produce less stormwater runoff and associated pollution than ASH-A. • May need to replace two existing stream culverts. A new culvert is likely to be larger than existing and increase conveyance capacity. • Would impact more stream buffer and open channel than ASH-A, which could affect hydrology and water quality. • Would remove more trees and impact more green space than ASH-1A. Tree removal can affect hydrology and water quality.

NOTE:

a) All alternatives could adversely impact stormwater or stormwater infrastructure if mitigation were not provided.

Table 4-4 Operational Impacts to Water Resources – Mariner Segment

Build Alternative	Water Resource Impacted	Impacts
MAR-1B	• Surface Water • Stormwater[a] • Groundwater	• Would remove a stormwater pond for parking. • May need to replace existing stream culvert. A new culvert is likely to be larger than existing and increase conveyance capacity.
MAR-1B with Surface Parking Design Option	• Stormwater[a] • Groundwater	• Would have less surface parking than MAR-D, which would produce less stormwater runoff and associated pollution.
MAR-2D	• Surface Water • Stormwater[a] • Groundwater	• Would remove a stormwater pond for parking.
MAR-2D with Surface Parking Design Option	• Stormwater[a] • Groundwater	• Would have a larger surface parking lot than MAR-B, which leads to increased stormwater runoff and associated pollution.

NOTE:

a) All alternatives could adversely impact stormwater or stormwater infrastructure if mitigation were not provided.

Table 4-5 Operational Impacts to Water Resources – SR 99/Airport Road Segment

Build Alternative	Water Resource Impacted	Impacts
AIR-1A	• Surface Water • Stormwater[a] • Groundwater	• Would impact buffer adjacent to an existing stream/open water wetland. One guideway column would be located within the wetland boundary. Degrading buffers can increase pollutant loading in surface waters. • Would impact an existing culvert and require daylighting the stream (York Creek Tributary). • May need to replace existing stream culvert. A new culvert is likely to be larger than existing and increase conveyance capacity. • Tree removal could impact hydrology and water quality.
AIR-2B	• Surface Water • Stormwater[a] • Groundwater	• May need to replace existing stream culvert with a fish passable structure. • Less tree removal than AIR-A and, therefore, fewer impacts to hydrology and water quality.

NOTE:

a) All alternatives could adversely impact stormwater or stormwater infrastructure if mitigation were not provided.

Table 4-6 Operational Impacts to Water Resources – SW Everett Industrial Center Segment

Build Alternative	Water Resource Impacted	Impacts
SWI-1A	• Surface Water • Stormwater[a] • Groundwater	• Would impact an existing culvert and require daylighting the stream (Seaway Avenue Tributary). • Closer to Boeing and residential areas, which could reduce vehicular traffic and associated pollution. • Would remove existing green space, increasing stormwater runoff and associated pollution.
SWI-1A with Lower Design Option	• Surface Water • Stormwater[a] • Groundwater	• Would impact an existing culvert and require daylighting the stream (Seaway Avenue Tributary). • Closer to Boeing and residential areas, which could reduce vehicular traffic and associated pollution. • At-grade guideway would remove more existing green space than an aerial guideway and produces more stormwater runoff and associated pollution.
SWI-1B	• Stormwater[a] • Groundwater	• Would remove fewest trees, which reduces stormwater runoff and associated pollution. • Would remove existing green space, increasing stormwater runoff and associated pollution.
SWI-1C	• Stormwater[a] • Groundwater	• Would remove existing green space, increasing stormwater runoff and associated pollution.

NOTE:

a) All alternatives could adversely impact stormwater or stormwater infrastructure if mitigation were not provided.

Table 4-7 Operational Impacts to Water Resources – SR 526/Evergreen Segment

Build Alternative	Water Resource Impacted	Impacts
EGN-1A	• Stormwater[a] • Groundwater	• Only alternative where at-grade guideway would cause impacts to East Fork Pigeon Creek No.2. • Would require the most tree removal. Tree removal would increase stormwater runoff and associated pollutants entering groundwater and surface water. • At-grade guideway through low-density residential areas would remove green space and increase stormwater runoff and associated pollutants more than the other alternatives. • May need to replace three existing stream culverts. New culverts are likely to be larger than existing culverts and would increase conveyance capacity. • Would cross a stream and impact the stream buffer; tree removal and stream buffer impacts can impact hydrology and water quality.

Build Alternative	Water Resource Impacted	Impacts
EGN-2B	• Stormwater[a] • Groundwater	• EGN-B and EGN-E would remove the fewest trees, which would result in fewer impacts to stormwater runoff and associated pollution. • Most at-grade guideway compared to other alternatives, which would produce more stormwater runoff and associated pollution.[b] • Places a structure in a wetland and wetland buffer which can decrease water quality. • More at-grade guideway through wetlands and buffers would have greater permanent impacts to hydrology and water quality compared to EGN-2B with North Side of SR 526 Design Option's aerial guideway through wetland and buffer.
EGN-2B with North Side of SR 526 Design Option	• Stormwater[a] • Groundwater	• Similar impacts to EGN-A, but with less of an increase in stormwater runoff and associated pollution due to less at-grade guideway through low-density residential. • Requires more tree removal than EGN-B or EGN-E. Tree removal would increase stormwater runoff and associated pollutants.
EGN-3E	• Stormwater[a] • Groundwater	• EGN-B and EGN-E would remove the fewest trees, which results in fewer impacts to stormwater runoff and associated pollution. • More at-grade guideway through wetlands and buffers would have greater permanent impacts to hydrology and water quality compared to EGN-3E with North Side of SR 526 Design Option's aerial guideway through wetland and buffer.
EGN-3E with North Side of SR 526 Design Option	• Stormwater[a] • Groundwater	• Similar impacts to EGN-A, but with less of an increase in stormwater runoff and associated pollution due to less at-grade guideway through low-density residential. • Requires more tree removal than EGN-B or EGN-E. Tree removal would increase stormwater runoff and associated pollutants. • Least amount of at-grade guideway of all alternatives in this segment.

NOTES:

a) All alternatives could adversely impact stormwater or stormwater infrastructure if mitigation were not provided.

b) At-grade guideway has a greater width per linear foot compared to aerial guideway

Table 4-8 Operational Impacts to Water Resources – Broadway/I-5 Segment

Build Alternative	Water Resource Impacted	Impacts
BI-1	• Stormwater[a] • Groundwater	• Would require more tree removal than BI-2. Tree removal would increase stormwater runoff and associated pollutants. • Would cross more green space with trees than BI-2. Tree removal would increase stormwater runoff and associated pollutants. • More at-grade guideway compared to BI-2, which would produce more stormwater runoff and associated pollution.[b]
BI-2	• Stormwater[a] • Groundwater	• Would impact more stream and wetland buffer than BI-1. Stream buffer impacts can decrease water quality. • More elevated guideway through residential and commercial areas than BI-1, fewer impacts to green spaces.

NOTE:

a) All alternatives could adversely impact stormwater or stormwater infrastructure if mitigation were not provided.

b) At-grade guideway has a greater width per linear foot compared to aerial guideway.

Table 4-9 Operational Impacts to Water Resources – Everett Station Segment

Build Alternative	Water Resource Impacted	Impacts
EVT-1A	• Stormwater[a] • Groundwater	• Impacts to water resources would be similar among all alternatives. Existing land is >90% impervious surface that includes roadway, parking lots, and structures.
EVT-2C	• Stormwater[a] • Groundwater	• Impacts to water resources would be similar among all alternatives. Existing land is >90% impervious surface that includes roadway, parking lots, and structures.
EVT-3D	• Stormwater[a] • Groundwater	• Impacts to water resources would be similar among all alternatives. Existing land is >90% impervious surface that includes roadway, parking lots, and structures.

NOTE:

a) All alternatives could adversely impact stormwater or stormwater infrastructure if mitigation were not provided.

4.1.1.3 OMF North Site Alternatives

A breakdown of the OMF North site alternatives' operational impacts to water resources is provided in Table 4-10. Operational impacts to streams and other aquatic resources, including wetlands, are described further in the Ecosystems Technical Report in Draft EIS Appendix G.10.

All OMF site alternatives would require substantial grading of the area, which would reroute the natural and previously altered flow of stormwater runoff. All three OMF North site alternatives would increase NPGIS and PGIS area in the study area.

None of the OMF North site alternatives would impact floodplains, floodways, or WPZs.

Table 4-10 Operational Impacts to Water Resources – OMF North Site Alternatives

Alternative	Water Resource Impacted	Impacts
OMF Site F	• Surface Water • Stormwater[a] • Groundwater	• Would increase impervious surface less than OMF Site B or OMF Site E as the OMF Site F area is already all developed (residential, commercial, and light industrial land uses), with small amounts of green space. • Would impact York Creek Tributary. • Would fill in existing stormwater retention facility.
OMF Site F with Lead Tracks to West Side of Airport Road	• Stormwater[a] • Groundwater	• Would increase impervious surface less than OMF Site B or OMF Site E as this area is already all developed (residential, commercial, and light industrial land uses), with small amounts of green space. • Would not impact streams, surface waters, or water crossings. • Would fill in existing stormwater retention facility. • Requires more tree removal than OMF Site F. Tree removal would increase stormwater runoff and associated pollutants entering groundwater and surface water.
OMF Site E	• Surface Water • Stormwater[a] • Groundwater	• Would create more new impervious surface, stormwater runoff, and associated pollution than OMF Site B or OMF Site F. • Would impact more stream channel, wetland, and buffer than OMF Site B or OMF Site F. • Would fill in existing stormwater retention facility.
OMF Site B	• Surface Water • Stormwater[a] • Groundwater	• Would fill in West Fork Tributary. • Would impact four stream culverts. • Would increase impervious surface, stormwater runoff, and associated pollution more than OMF Site F, but less than OMF Site E. • Would fill in existing stormwater retention facility.
OMF Site B with Lead Tracks to South Side of SR 526	• Surface Water • Stormwater[a] • Groundwater	• Would fill in West Fork Tributary. • Would impact more stream channel than OMF Site B (Merrill & Ring Creek and Narbeck Creek). • Would impact four stream culverts. • Impacts more green space and removes more trees than OMF Site B. This would increase stormwater runoff and associated pollutants entering groundwater and surface water. • Would increase impervious surface, stormwater runoff, and associated pollution more than OMF Site F, but less than OMF Site E. • Would fill in existing stormwater retention facility.

NOTE:

a) All alternatives could adversely impact stormwater or stormwater infrastructure if mitigation were not provided.

4.1.1.4 Potential Design Refinements

As mentioned in Section 1.2, Sound Transit is considering potential design refinements in each alignment segment. Potential changes to water resource impacts may result from one of the potential design refinements as described in Table 4-11.

Table 4-11 Potential Changes to Water Resource Impacts

Potential Design Refinement	Applicable Alternatives	Potential Changes to Impacts
Shift the guideway near the intersection of 184th Street SW and Alderwood Mall Parkway north to reduce building impacts.	ALD-2D, ALD-2D with Alderwood Mall Boulevard Design Option, ALD-2F, and ALD-2F with Alderwood Mall Boulevard Design Option	Stream and floodplain impacts would be similar in scale but may affect different locations within the segment.

4.1.2 Construction Impacts

In general, the following construction-related activities would occur for all Build Alternatives and create the potential for similar impacts on water resources due to the ground disturbance required, construction techniques, and equipment required. Construction activities, including clearing and grubbing, demolition, drilling, and paving, increase the potential for flooding, erosion, and the degradation of water quality. Common construction activities that could affect water resources include:

- **Earthwork, trench work, stockpiling, and material transport.** Soil exposed in sloped excavations, fills, or trench work is especially susceptible to erosion until vegetation is established or the surface is stabilized with pavement. If exposed soil becomes dry, it can be eroded by wind (fugitive dust). Loose soil can be carried off site by water or wind to stormwater drains or streams, where it increases suspended sediment and water turbidity. Construction vehicle tires can carry soil onto roadways, where it can then be washed into ditches or streams during storms. Increased turbidity and suspended sediment reduces light transmission and decreases dissolved oxygen in the water.
- **Concrete work and paving.** The pH in surface water can be increased to levels harmful to fish and wildlife if runoff mixes with process water or slurry from concrete work or curing concrete.
- **Construction machinery.** Equipment leaks or spills that include hydrocarbons and other hazardous materials associated with construction can affect water quality in nearby water resources.
- **Stream crossings.** Overwater work, stream relocations, and construction in stream buffers can pose a direct risk to water quality through pollutant spills, sediment transport, or wind deposition of stockpiled materials.
- **In-water work.** The risk of scour is usually increased during the construction phase of in-water work. This has the potential to mobilize sediments at the project site and contribute to turbidity and sedimentation.

4.2 No Build Alternative

Under the No Build Alternative, there would be no construction or operational impacts from the EVLE Project to existing water resources. The amount of impervious and pollutant-generating surface areas throughout the study area would remain the same or be altered by other development. In addition, surface waters, stormwater utilities, floodplains, soils, and groundwater would not be impacted in any way by a light rail project. There would be no increase in NPGIS and PGIS surfaces from the project, and streams and wetlands would not be impacted by construction of the project. The infiltration capabilities of soils throughout the study area would not be reduced, and the amount of natural aquifer/groundwater recharge that currently occurs would remain unchanged.

Without the additional light rail service, the patterns of use of passenger vehicles for transportation throughout the region would be unlikely to change. Stormwater runoff from roadways would continue carrying high amounts of pollutants into waterways, pollutants that light rail operation does not produce. The growing regional population would result in more vehicles on the roads and increased traffic congestion. These outcomes may influence decisions to expand roadway infrastructure to accommodate the increased traffic volumes, thus producing more PGIS and further contamination of surface water. In addition, existing untreated stormwater would remain untreated.

The No Build Alternative would not include the beneficial outcomes expected to result from mitigation measures required to offset adverse impacts of the project. Often, for critical area impacts, project owners are required to restore more area/lineal feet/functionality of critical areas than are impacted by the project. Although the No Build Alternative may result in less impervious area and impacts, it may also result in less restoration of water crossings and stream channels.

5 POTENTIAL MITIGATION MEASURES

Sound Transit seeks to mitigate potential impacts on water resources by continued project design and development measures that follow local stormwater management regulations, use required best management practices (BMPs) and encourage low-impact development approaches where feasible. This section discusses BMPs that would be included in the project design regardless of the findings of this water resources impact analysis as well as compensatory mitigation that would be required where surface water resources are impacted.

Stormwater management for the EVLE Project would follow the *Sound Transit Requirements Manual* (Sound Transit 2023), which requires stormwater design for Sound Transit projects to conform to the requirements of the local jurisdictions. The EVLE Project would comply with the following local design manuals:

- *WSDOT Highway Runoff Manual* (April 2019).
- *City of Lynnwood Annual Stormwater Management Program Plan* (March 2022) and *Ecology Stormwater Management Manual for Western Washington* (July 2019).
- *City of Everett and Ecology Stormwater Management Manual for Western Washington* (July 2019).
- *Snohomish County Drainage Manual* (July 2021).

Based on the guidance provided in Sound Transit's *Requirements Manual*, Low Impact Development (LID) is a preferred stormwater management method and should be employed wherever possible. However, in areas where use of LID measures is not feasible due to physical site constraints, other techniques may be used.

5.1 Tribal and Agency Coordination

As design advances, Sound Transit would continue to coordinate with Tribes and agencies having jurisdiction on issues related to water resources as described below.

5.1.1 Surface Water

Impacts on identified surface water features would be coordinated with Tribes with usual and accustomed fishing areas within the study area (the Muckleshoot Indian Tribe and Tulalip Tribes of Washington) and with the agencies having jurisdiction, including the City of Lynnwood, City of Everett, Snohomish County, WDFW, Ecology, and the United States Army Corps of Engineers (Corps).

5.1.2 Stormwater

As the project design advances, potential project impacts on existing stormwater infrastructure would be coordinated with the City of Lynnwood, City of Everett, Snohomish County, and WSDOT.

5.1.3 Floodplains and Floodways

Project activities and outcomes that impact base flood elevations would be coordinated with the local floodplain administrator/manager and, if necessary, FEMA.

5.1.4 Groundwater

If the Build Alternatives would result in potential impacts on a CARA and WPZ, coordination would occur with Ecology and WSDH.

5.2 Additional Potential Mitigation Measures

This section presents additional potential mitigation measures that would further reduce or eliminate adverse effects. Final mitigation measures will be based on advanced design and will be included in the Final EIS and in FTA's Record of Decision as environmental commitments for the project.

5.2.1 Surface Water

5.2.1.1 Alignments

Some alignment alternatives would avoid stream crossings and any associated surface water impacts. For example, Alternative ASH-2D would avoid Ash Way Creek entirely, compared to

Alternative ASH-1A which would cross the stream with aerial guideway. Where surface waters are crossed by the alignment alternatives, Sound Transit designed the guideway to be aerial to avoid the impacts an at-grade guideway would cause (conceptual design drawings included in Draft EIS Appendix F). The aerial guideway columns have been strategically located out of surface water features and as far from their boundaries as possible.

Impacts to open stream channels would be avoided where possible; however, construction activities near piped streams would require coordination with WDFW to evaluate whether the culvert needs to be replaced with a fish-passable structure. Coordination with WSDOT would also be required for construction activities near piped streams within the WSDOT right-of-way.

5.2.1.2 Stations

Some station alternatives would avoid surface water impacts. For example, Station SWI-C would avoid surface water impacts by locating the proposed station over an existing parking lot. The amount of conversion of existing pervious to impervious compared to area of proposed new pervious surfaces is approximately equal and therefore avoids causing impacts to the hydrology of the adjacent wetland because infiltration and groundwater recharge potential remain the same. New stormwater facilities meeting modern attenuation requirements could benefit the wetland hydrology by controlling runoff into the wetland to a rate similar to a historically forested condition, as the existing parking lot was constructed in the 1990s and had different stormwater attenuation requirements.

5.2.1.3 Operations and Maintenance Facilities

OMF Site F would avoid impacts to streams, whereas OMF Site B and OMF Site E would impact streams. See the Ecosystems Technical Report in Draft EIS Appendix G.10 for additional information on stream impacts and mitigation.

OMF Site F would also convert the least amount of pervious surface to impervious surface compared to OMF Site B and OMF Site E. Fewer acres of conversion from pervious to impervious surfaces would result in less impact to soil infiltration and reduced impacts to stream baseflows and wetland hydroperiods. The benefits of infiltration and local hydrology for surface waters are discussed in Section 4.1.1.1.

5.2.1.4 Additional Mitigation

Where impacts to streams cannot be avoided or minimized, compensatory mitigation would be required to offset temporary and permanent impacts. Compensatory mitigation for impacts to Waters of the U.S. and Waters of the State would be required by the Corps (Corps 2024), Ecology (2024c), and local agencies (through municipal codes) and would likely need to occur within the same WRIA where impacts occur.

Stream mitigation may require hydraulic engineering and may include site-specific or off-site mitigation, such as stream realignment, stream daylighting, stream restoration, and/or stream enhancement as approved by Ecology, WDFW, the Corps, or other regulatory agencies. A mitigation plan would be prepared for the Preferred Alternative pursuant to federal, state, and local regulations to meet no net loss of aquatic habitat length, functions, and habitat value.

5.2.2 Stormwater

In areas where the guideway (NPGIS) would be over existing PGIS, such as crossing a road or parking lot, no net change in PGIS is assumed. Even though the overlying guideway would intercept precipitation, it is assumed that the runoff from surrounding PGIS would pick up and transport pollutants from the underlying ("covered") PGIS and carry them to the local drainage system. Discharges would continue to their current locations, typically into the same municipal stormwater systems. Thus, there would be no net reduction in existing PGIS. Similarly, a guideway situated over existing NPGIS would be considered no net change in NPGIS. Despite no net change to PGIS, flow control and treatment of guideway stormwater will be included in the design of all alternatives.

Alternatives that locate stations, alignments, and the OMF North site within areas that are currently untreated PGIS may provide opportunities to improve stormwater quality.

Minimizing the total pollutants generated by PGIS would lead to reduced project mitigation requirements. Potential avoidance and minimization design measures include:

- Using the least amount of pavement as practicable in the design of stations and OMF facilities.
- Specifying pervious pavement where pavement is needed and on-site soils have been evaluated for infiltration capacity.
- Maintaining runoff flow paths and discharge locations to existing surface waters, habitat, vegetation, and wildlife that depend on those hydrologic inputs.
- Making walking or biking to the light rail stations and OMFs safer and more accessible, leading to reduced car usage and the input of pollutants.
- Locating proposed impervious features over existing impervious surfaces to reduce the increase in PGIS.

To avoid and minimize impacts during construction, an approved Construction Stormwater General Permit (CSWGP) and Stormwater Pollution Prevention Plan (SWPPP) would be developed and implemented for the project. The SWPPP would serve as the overall construction stormwater mitigation plan by describing overall procedural and structural pollution prevention and flow control BMPs. The SWPPP would also include location, size, maintenance requirements, and monitoring BMPs including for water quality during construction. An Ecology Certified Erosion and Sediment Control Lead (CESCL) would be employed to conduct compliance inspections.

The SWPPP would include each of the following plans:

- Temporary Erosion and Sediment Control Plan – details the design and construction specifications for BMPs to be used to identify, reduce, eliminate, or prevent sediment and erosion problems.
- Stormwater Site Plan – outlines a plan to manage stormwater on the construction site.
- Spill Prevention, Control, and Countermeasures Plan – outlines requirements for and implementation of spill prevention, inspection procedures, equipment, material containment measures, and spill response procedures.

- Concrete Containment and Disposal Plan – outlines the management, containment, and disposal of concrete debris, slurry, dust, and washout and discusses BMPs that would be used to prevent high pH process water from entering surface waters.
- Dewatering Plan – outlines procedures for pumping groundwater away from the construction area, including any storing, testing, treating, reinjection, and discharging as necessary.
- Fugitive Dust Plan – outlines measures to prevent the generation of fugitive dust from exposed soil, construction traffic, and material stockpiles.

Which specific BMPs are utilized during construction would be chosen based on site conditions and the construction activities involved. Potential BMPs to be implemented include the following:

- Phasing the work to minimize the amount of disturbed area at any one time.
- Developing construction plans for sensitive areas (such as stream crossings) that minimize the need for haul roads over streams. If haul roads over streams are needed, building temporary bridges or platforms with small piles (i.e. pin piles) instead of using fill material and culverts.
- Marking/fencing of construction limits.
- Minimizing the amount of cleared and cut pavement areas at any one time to the extent feasible.
- Stabilizing construction entrances and haul roads.
- Washing truck tires at construction entrances, as necessary.
- Cleaning construction site track-out from public roads, as necessary.
- Installing silt fence downslope from exposed soil.
- Protecting catch basins, inlets, or other storm system entry points from sediment-laden runoff.
- Containing and controlling concrete and hazardous materials on site.
- Providing secondary containment for all potential sources of leaks and spills.
- Installing temporary ditches to route runoff around and through construction sites, with periodic check dams to slow and settle runoff.
- Installing water treatment systems to remove sediment and/or pollutants in stormwater runoff before it is discharged to storm system entry points, as necessary.
- Using temporary mulch or erosion control blankets to cover exposed soil and stockpiles.
- Using straw wattles and vertical tracking to minimize runoff concentration.
- Conducting vehicle fueling and maintenance activities no closer than 100 feet from water.
- Protecting streams by working within the required “work window” identified in the Hydraulic Permit Approval (HPA).

All alternatives that generate additional stormwater runoff and pollution would include engineered treatment to avoid adverse impacts to water resources. Where stormwater runoff from existing PGIS is not treated or the existing stormwater system does not meet current design standards, impacting these areas and installing treatment BMPs could improve water quality. New stormwater infrastructure would create opportunities for pollutant removal, such as detention ponds/vaults and bioretention with underdrains, that would comply with local stormwater codes and water quality standards.

Bioretention is “designed to mimic natural forested conditions where healthy soil structure and vegetation promote the infiltration, storage, filtration and slow release of stormwater flows” (Ecology 2019). The use of infiltration will be incorporated into stormwater designs when geotechnical information on existing soil infiltration potential becomes available. Flow control would be incorporated into all proposed stormwater systems to simulate a pre-development runoff condition (natural condition) when required by the local jurisdiction the stormwater system is in. Flow control, that limits the release of stormwater to pre-development conditions, provides opportunities for infiltration, storage, and filtration that may not be present in the existing conditions. Peak flow rates on systems with flow control have lower peak flood flow rates at discharge points compared to existing conditions.

Where flow control is required, a pretreatment BMP is required prior to infiltration to reduce the occurrence of plugging. In addition, Sound Transit requires that the stormwater features meet the LID performance standard, which requires post-developed runoff rates to match pre-developed runoff rates from 8% of the 2-year through the 50% of the 2-year flow (in addition to the regular flow control standard of 50% of the 2-year through the full 50-year flow). Together, flow control and stormwater treatment would mitigate impacts to urban stream surface water inputs and could improve water quality over existing conditions. Where existing sparsely vegetated areas are temporarily impacted by construction and are restored to a more densely vegetated state, stormwater runoff could decrease as well as pollution associated with stormwater runoff. Stream channels receiving runoff from these areas would be more “buffered” as the soils and vegetation reduce stormwater runoff and pollutants before it enters the stream.

5.2.3 Floodplains and Floodways

All Build Alternatives would cross the FEMA-regulated Swamp Creek floodplain. Where a guideway column is proposed within the FEMA-regulated Swamp Creek floodplain, flood storage and flow conveyance would be maintained and designed to avoid a rise in the 100-year flood surface. An example of how to mitigate for flood storage and flow conveyance involves removing an equivalent or greater amount of soil volume compared to the guideway column from the floodplain to offset the lost flood storage. The soil would also be removed in a way that opens up the floodplain perpendicular to the anticipated flow of flood waters to provide an equivalent or greater amount of flood conveyance than is lost to the guideway column. Adhering to these two criteria for material removal would ensure no rise of the 100-year flood surface would occur as a direct result of the project. Further, new or replaced water crossing structures over streams would be designed to maintain conveyance of the 100-year recurrence interval flood without producing a rise in the water surface elevation. WAC Chapter 173-158 requires 3 feet of freeboard above the 100-year water surface elevation for bridges to safely pass debris during a large flood.

5.2.4 Groundwater

In the West Alderwood Segment, Alternative ALD-1B would avoid the wellhead protection area shown in Figure 3-30 and Figure 3-31. If Alternative ALD-2D or Alternative ALD-2F are selected, design considerations would need to avoid overdrawing groundwater or impacting water quality within the wellhead protection area. During construction, portions of the Alternative ALD-2D or ALD-2F guideway or station may need drawdown wells to increase constructability. Long term, underground sump pumps may be used to protect infrastructure from high water tables, as is the case with Sound Transit's OMF East in Bellevue, Washington. As the overall design progresses, hydrogeological studies would be performed to evaluate potential short-term and long-term complications with drainage and groundwater.

The stormwater design approach and BMPs described above would protect groundwater elevations and water quality of groundwater resources as well as soil characteristics.

The private wellhouse located within OMF Site B would need to be decommissioned. To mitigate this impact, a new wellhouse would need to be constructed in a nearby location.

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