

Technical Memorandum

TO: John Cole, Capital Engineer, City of Federal Way
FROM: Steven Quarterman
DATE: March 2, 2022
RE: **Wetland/Waterway Preliminary Investigation
Pacific Highway (SR 99) at South 373rd Street Roundabout Project (CFW #36224)
Federal Way, Washington
Project No. 238096.010**

Introduction

The City of Federal Way (City) is proposing to construct a roundabout at the intersection of Pacific Highway South (SR 99) and South 373rd Street and has requested reconnaissance level assessment of wetland/waterway critical areas within 200 feet (ft) of the intersection improvements (Figure 1, Vicinity Map).

Landau Associates, Inc. (Landau) conducted a preliminary wetland and waterway investigation to assist the City in determining the approximate location of wetlands, waterways, and their buffers, which may be regulated by local, state, and/or federal agencies, to assist in evaluation of potential capital improvement alternatives. This technical memorandum identifies the presence of wetlands and/or waterways in the project area and their estimated buffers and documents the methods and results of the wetland reconnaissance (identification and characterization) and waterway characterization in accordance with local, state, and federal guidelines (Attachment 1, Regulatory Overview). This technical memorandum was prepared to help guide planning-level evaluation of the sites and is not intended to support project permitting and compliance.

Site Description

The project area is located within the Puyallup-White watershed (Water Resource Inventory Area 10) in Section 31 of Township 21 North, Range 4 East, and consists of approximately 3.1 acres (Figure 2).

Methodology

Landau performed a wetland and waterway investigation in accordance with the US Army Corps of Engineers' (USACE's) *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (2010), adopted by the Washington State Department of Ecology (Ecology) under WAC 173 22-035. The waterway investigation used methodology provided in Ecology's *Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State* (Anderson et al. 2016). The USACE and Ecology recommend preliminary data-gathering and synthesis of available background information, followed by a field investigation.

Background Information Review

Landau reviewed the following public domain resources to determine existing conditions and to identify potential wetlands and waterways within the study area:

- Aerial photograph of study area (Figure 2).
- US Geological Survey (USGS) topographic map (USGS 2013; Attachment 2, Figure 2-1).
- US Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) map (USFWS 2015, Attachment 2, Figure 2-2).
- City Critical Areas Map (City of Federal Way 2016).
- US Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) Soil Survey Geographic Database for King County (USDA, NRCS 2006; Attachment 2, Figure 2-3).
- National Hydric Soils List (USDA, NRCS 2022b).
- Flood data (FEMA 2020; Attachment 2, Figure 2-4).
- Precipitation data (USDA, NRCS 2022a).
- Washington Department of Fish & Wildlife (WDFW) SalmonScape (WDFW 2022).

Wetland Identification and Classification

Landau conducted a field reconnaissance to characterize wetlands within the study area for the purpose of determining wetland classification and applicable standard buffers. The USACE outlines a three-parameter approach to determining the presence or absence of wetlands, which requires evaluating vegetation, soil, and hydrology (Table 1). A cursory determination was made based on the presence of onsite vegetation and indicators of hydrology (such as standing water or water marks or indicators of the vegetation community) as well as background information.

Any wetlands identified as part of this project were classified according to the USFWS Cowardin classification system (Cowardin et al. 1979) and the USACE's hydrogeomorphic (HGM) classification system (Brinson 1993).

Wetlands were provided a preliminary rating in accordance with the *Washington State Wetlands Rating System for Western Washington* (Hruby 2014), which is accepted practice by the City. This system categorizes wetlands based on their existing functions, including water quality, hydrology, and habitat as well as on the wetland's rarity, sensitivity to disturbance, or irreplaceability. Wetlands are classified into four categories:

(a) Category I wetlands represent a unique or rare wetland type, are more sensitive to disturbance than most wetlands, are relatively undisturbed and contain ecological attributes that are impossible to replace within a human lifetime, or provide a high level of function. The following types of wetlands are Category I:

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- (i) Wetlands of high conservation value that are identified by scientists of the Washington Natural Heritage Program/Department of Natural Resources;
 - (ii) Bogs;
 - (iii) Wetlands with mature and old growth forests larger than one acre; and
 - (iv) Wetlands that perform functions at high levels (wetlands that score 23 points or more based on functions).

(b) Category II wetlands are difficult, though not impossible, to replace, and provide high levels of some functions. Category II wetlands are those wetlands that score between 20 and 22 points based on functions.

(c) Category III wetlands are wetlands with a moderate level of functions that score between 16 and 19 points based on functions.

(d) Category IV wetlands are wetlands with the lowest level of functions (scoring less than 16 points based on functions) and are often heavily disturbed.

Formal rating is recommended following delineation of the identified wetlands. Wetland buffers were determined based on category according to Federal Way Revised Code (FWRC) Chapter 19.145.420.

Waterway Identification and Classification

Where accessible, the ordinary high water mark (OHWM) was identified in accordance with methodology developed by Ecology (Anderson et al 2016). In keeping with the methodology, Landau reviewed existing hydrologic data and observed field indicators, including hydrology, soils and sediments, vegetation, and marks of scouring. The boundaries of waterways extending outside of the study area were estimated using vegetation and hydrologic indicators observed from within the study area, aerial photographs, and/or other information from the background-information review. Stream type is based on FWRC Chapter 19.145.260, in which streams are classified in accordance with the Washington State Department of Natural Resources (DNR) water typing system (WAC 222-16-030).

Stream classifications include:

- Type S: Streams inventoried as “shorelines of the state,” per Chapter 90.58 RCW and rules promulgated pursuant to Chapter 90.58 RCW.
- Type F: Streams that contain fish habitat.
- Type Np: Perennial non-fish habitat streams.
- Type Ns: Seasonal non-fish habitat streams.

Results

The results of the information review and wetland/waterway reconnaissance are described in the following section.

Background Information Review

The background information review revealed the following information related to wetlands, waterways, and soils within the study area.

Wetlands

The USGS topographic map does not identify any wetlands in the study area (see Attachment 2, Figure 2-1). However, the NWI map identifies a palustrine, scrub-shrub, broad-leaved deciduous, temporary flooded (PSS1A) wetland in the southeast quadrant of the intersection in the study area and a palustrine, forested, broad-leaved deciduous, seasonally flooded (PFO1C) wetland in the northeast quadrant of the intersection in both the project area and study area (see Attachment 2, Figure 2-2). An additional PFO1C wetland is located south of South 373rd Street at the eastern terminus of the project and is a component of the Washington State Department of Transportation Spring Valley mitigation site.

City critical areas mapping identifies wetlands in the vicinity of the NWI mapped PSS1A wetland in the southeast quadrant of the intersection and PFO1C wetland in the northeast quadrant of the intersection. City critical area mapping identifies additional wetlands west of SR 99 at the intersection with South 373rd Street and west of SR 99 at the southern end of the study area.

Waterways

The USGS topographic map does not identify any waterways in the project area or study area. City critical area mapping identifies a stream parallel to the west side of SR 99 at the south end of the study area. The City-mapped stream is not identified with fish presence on WDFW SalmonScape or identified on the DNR Forest Practices Application Mapping Tool.

Soils

Soil information can be helpful when determining the likelihood of the presence/absence of wetlands. Hydric soil is one indicator necessary to classify an area as wetland. The Soil Survey Geographic Database for King County, Washington (USDA, NRCS 2012a) identifies two soil series within the project area and study area (see Attachment 2, Figure 2-3):

- Bellingham series consists of very deep, poorly drained soils formed in loess, alluvium, and lacustrine sediments (USDA NRCS 2000). These soils are in depressions. The Bellingham unit (Bh) in the project area and the study area is listed as hydric on the National Hydric Soils List (USDA, NRCS website 2022b).

- Kitsap (KpB), consist of somewhat poorly drained soils on terraces and terrace escarpments (USDA NRCS 2018). The Kitsap unit (KpB) in the project area and study area is included on the National Hydric Soils List with components of the Bellingham, Seattle, and Tukwila soil series in depressions (USDA, NRCS website 2022).

Floodplain

The flood insurance rate map (FEMA 2020) does not identify 100-year floodplain in the project area or study area (see Attachment 2; Figure 2-4).

Field Investigation

Landau biologists Steven Quarterman and Nick Ulacia conducted a field investigation on February 9, 2022. The weather during the site reconnaissance was sunny and approximately 50°F. Landau had limited access to properties in the study area; access was limited to the existing road right-of-way and Parcels 3221049055 and 3221049087.

Precipitation data (National Climatic Data Center 2022) for the 3-month period prior to the field investigation indicate recorded precipitation levels were wetter than the normal range listed in NRCS WETS tables (Attachment 3).

Landau identified four potential wetlands, one waterway, and potentially jurisdictional ditches as shown in Figure 3 and summarized in Table 2. The potential wetlands and waterways identified are subject to field delineation.

Preliminary Impact and Permitting Assessment

The proposed project limits will be refined as design progresses, and the project is likely to have unavoidable wetland and buffer impacts, which are anticipated to require compensatory mitigation.

FWRC Chapter 19.145.120(1) identifies the following partial exemption for critical areas related to public facilities and other public improvements:

Essential public facilities, public utilities and other public improvements. The director may permit the placement of an essential public facility, public utility or other public improvements in a critical area if no practical alternative with less impact on the critical area(s) exists. The specific location and extent of the intrusion into the critical area must constitute the minimum necessary encroachment to meet the requirements of the public facility or utility and not pose an unreasonable threat to the health, safety, or welfare on or off the subject property. The intrusion shall attempt to protect and mitigate impacts to the critical area function and values. The “public utility and other public improvements” shall not include improvements whose primary purpose is to benefit a private development, including without limitation interior roads or privately owned detention facilities installed within or during the construction of a residential

subdivision, binding site plan, or other commercial development. The director may require supporting documentation to demonstrate compliance with partial exemptions.

Requirements for fulfilling the partial exemption may be clarified with the City Community Development Department.

Project impacts will also be subject to permitting through the USACE for authorization under Section 404 of the Clean Water Act and potentially WDFW for Hydraulic Project Approval. The USACE may be able to process the project application under the Nationwide Permit (NWP) program, which includes category for Linear Transportation Project (NWP 14) provided conditions of the NWP can be satisfied.

Conclusions

Following its background-information review and field investigation, Landau has identified wetlands and waterways in the project vicinity that may be subject to regulation by the City, WDFW, and/or the USACE, and ditches potentially jurisdictional under the Clean Water Act with jurisdiction limited to the USACE. Project impacts may be subject to partial exemption as detailed in Chapter 19.145.120(1) of the FWRC, and permitting through the WDFW (i.e., Hydraulic Project Approval) and USACE (i.e., authorization under Section 404 of the Clean Water Act).

* * * * *

Use of This Technical Memorandum

The findings presented herein are based on Landau Associates, Inc.'s (Landau's) understanding of the Federal Way Revised Code, the USACE wetland delineation methodology, and the Washington State Department of Ecology's ordinary high water mark delineation methodology. Findings are based in part on interpretation of the vegetative, soil, and hydrologic conditions observed during Landau's February 9, 2022 field investigation.

This wetland and waterway technical memorandum was prepared for the exclusive use of the City of Federal Way and applicable regulatory agencies. No other party is entitled to rely on the information, conclusions, and recommendations included in this document without the express written consent of Landau. Further, the reuse of information, conclusions, and recommendations provided herein for extensions of the project or for any other project, without review and authorization by Landau, shall be at the user's sole risk.

Potential wetlands/waterways identified by Landau are considered preliminary until the USACE and/or local jurisdictional agencies validate the boundaries. Because wetlands are dynamic communities, wetland boundaries may change over time. The agencies typically recognize wetland delineations for a period of 5 years following an approved jurisdictional determination. In addition, changes in government code, regulations, and/or laws may occur.

LANDAU ASSOCIATES, INC.



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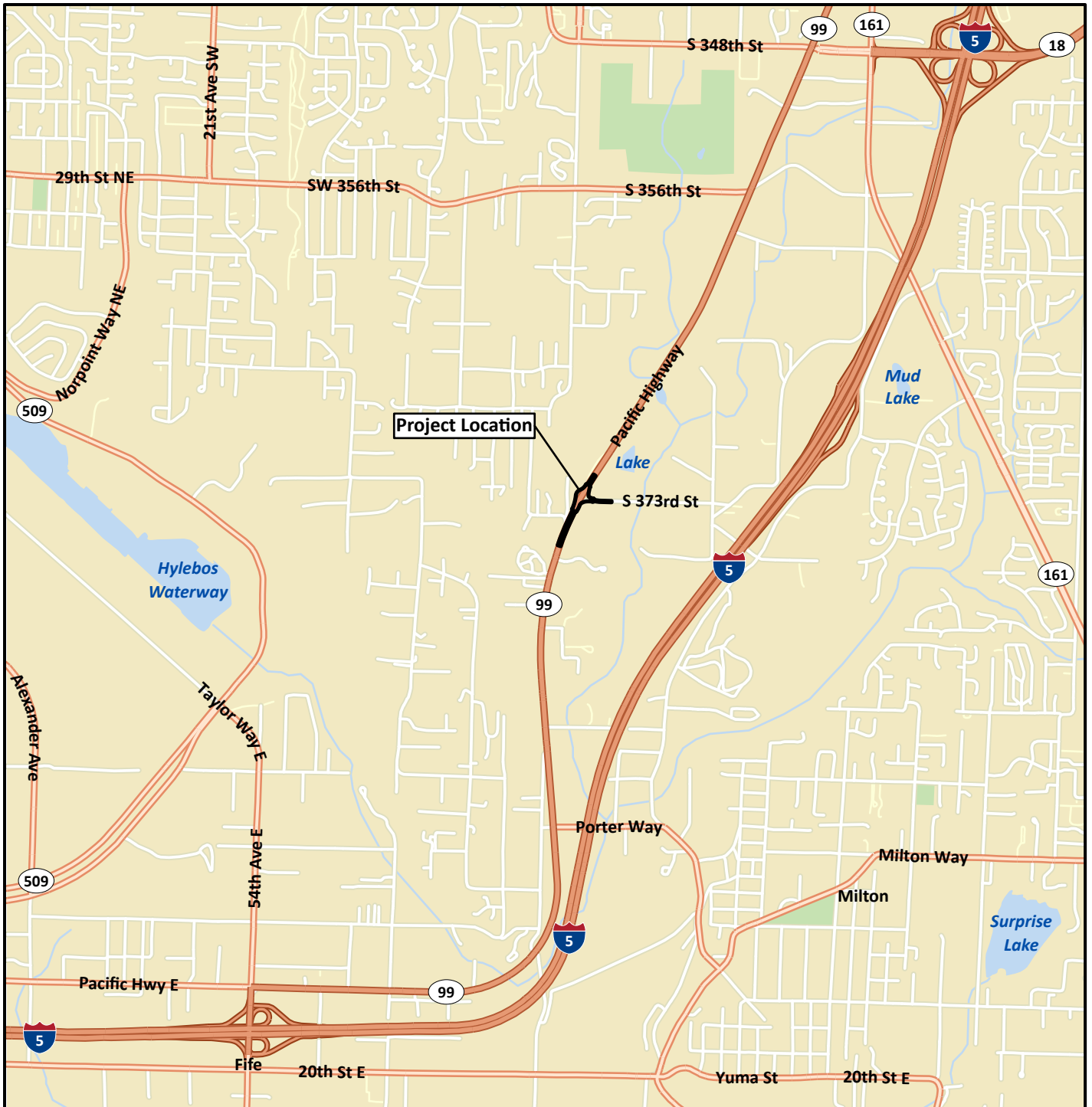
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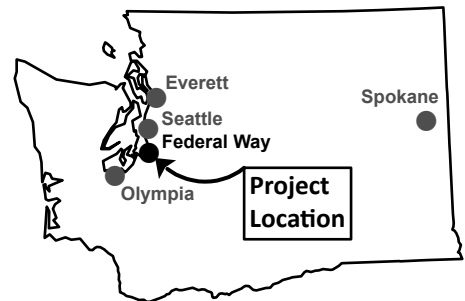
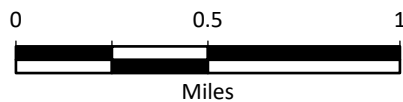
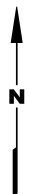
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Attachments: Figure 1 – Vicinity Map
Figure 2 – Study Area Map
Figure 3 – Wetland/Waterway Reconnaissance Location Map
Table 1 – Methods for Wetland Determination
Table 2 – Wetland/Waterway Summary Table
Attachment 1 – Regulatory Overview
Attachment 2 – Background Review Figures
Attachment 3 – Natural Resources Conservation Service Rainfall Documentation
Worksheet



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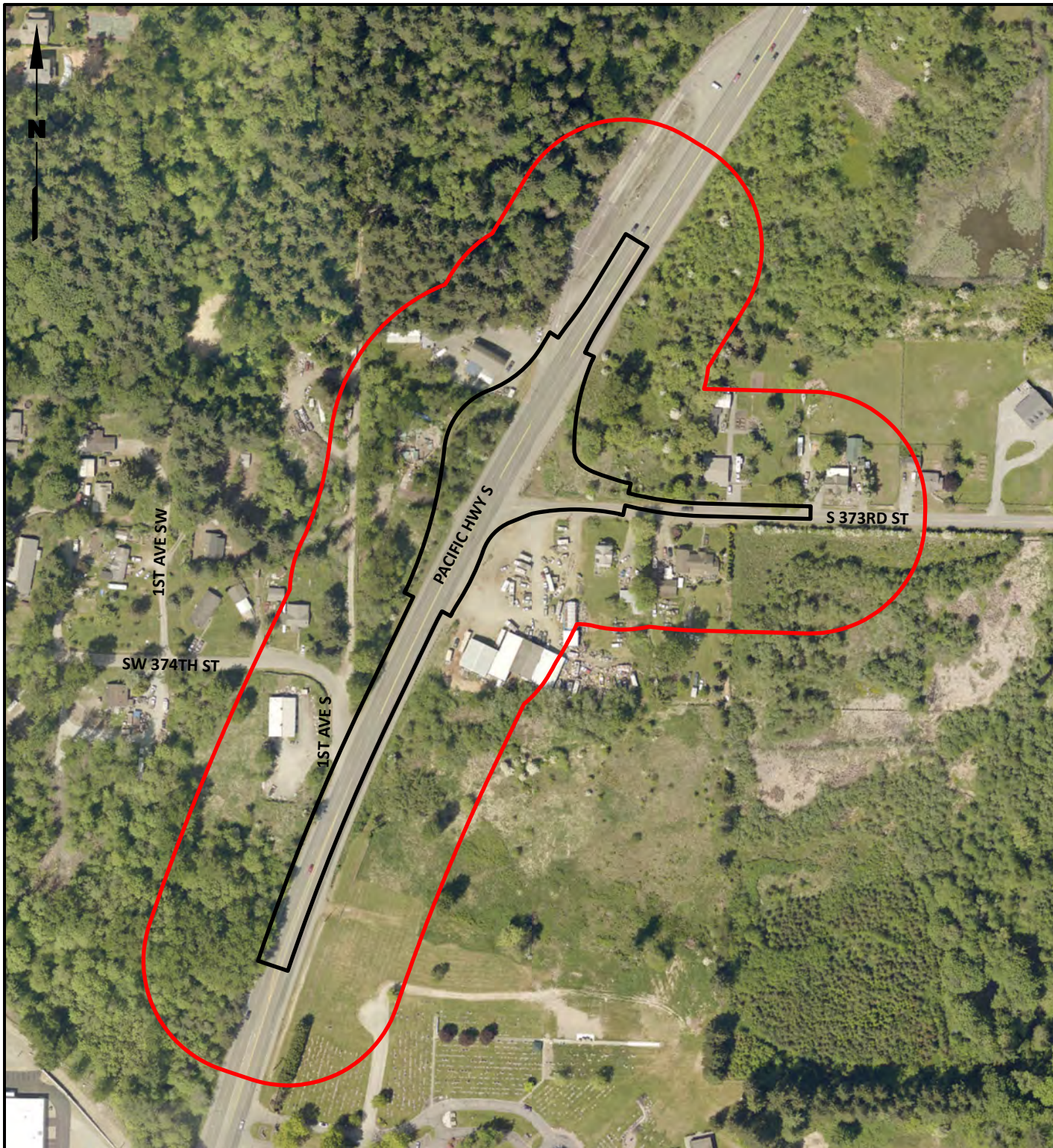
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Pacific Highway at S 373rd Street
Roundabout Project
Federal Way, Washington

Vicinity Map

Figure
1

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Legend

- Study Area
- Project Area
- Tax Parcels

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.



Scale in Feet

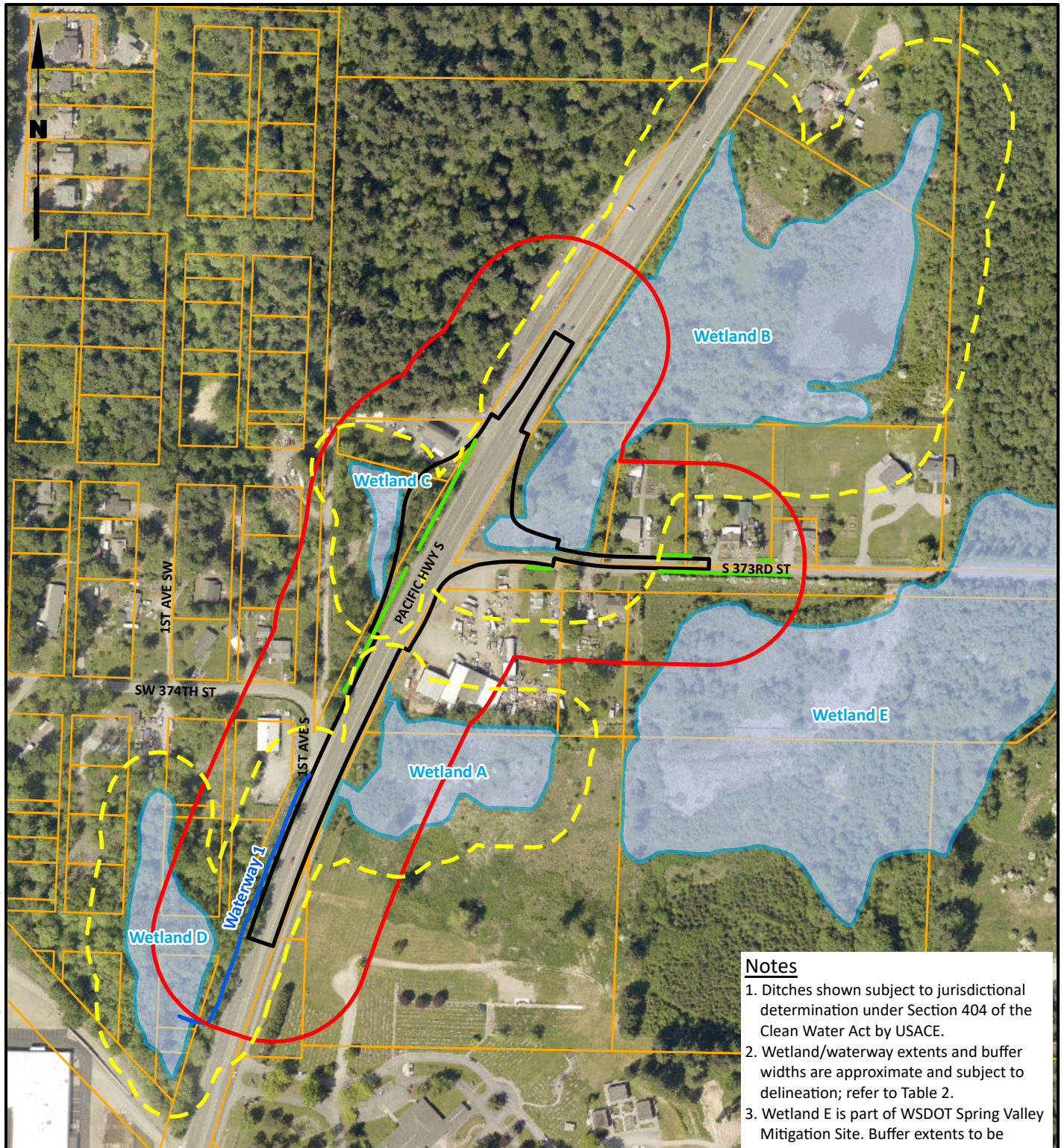
Data Source: King County GIS.

Pacific Highway at S 373rd Street
 Roundabout Project
 Federal Way, Washington

Study Area Map

Figure
2

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Legend

- Ditch
- Waterway
- Wetland
- Wetland/Waterway Buffer

- Study Area
- Project Area
- Tax Parcels



Notes

1. Ditches shown subject to jurisdictional determination under Section 404 of the Clean Water Act by USACE.
2. Wetland/waterway extents and buffer widths are approximate and subject to delineation; refer to Table 2.
3. Wetland E is part of WSDOT Spring Valley Mitigation Site. Buffer extents to be determined upon review of mitigation documentation.
4. Standard buffer widths shown. Buffers may be reduced to extents of existing alterations (e.g. roadways) in accordance with FWRC 19.145.440(4).
5. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Data Source: King County GIS.

Pacific Highway at S 373rd Street
Roundabout Project
Federal Way, Washington

Wetland/Waterway Location Map

Figure
3

Table 1
Methods for Wetland Determination
Pacific Highway (SR 99) at S 373rd Street Roundabout Project
Federal Way, Washington

Parameter	Definition	Field Indicators	Field Assessment
Wetland Vegetation	<p>Wetland vegetation is adapted to saturated soil conditions. The US Army Corps of Engineers (USACE) has assigned a wetland indicator to each plant species that denotes its frequency of occurrence within wetlands (Lichvar and Kartesz 2009). These are:</p> <ul style="list-style-type: none"> Obligate (OBL) wetland plants usually occur in wetlands under natural conditions (more than 99 percent of the time). Facultative wetland (FACW) plants usually occur in wetlands (67 to 99 percent of the time), but are occasionally found in non-wetlands. Facultative (FAC) plants are equally likely to occur in wetlands or non-wetlands (34 to 66 percent of the time). Facultative upland (FACU) plants usually occur in non-wetlands, but are occasionally found in wetlands (1 to 33 percent of the time). Obligate upland (UPL) plants usually occur in uplands (more than 99 percent of the time). 	<p>More than 50 percent of the dominant plants totaled from all vegetation strata are hydrophytic, i.e., those species with indicators of OBL, FACW, or FAC (regardless of modifier),</p> <p>or</p> <p>A plant community has a visually estimated cover percentage of OBL and FACW species that exceeds the coverage of FACU and UPL species. If dominance is not met, the Prevalence Index is calculated, or consideration is given to morphological adaptations and/or non-vascular plants observed.</p>	<p>Dominance: The dominant plants and their wetland indicator status are evaluated quantitatively within data plots and visually throughout the study area. If the test for dominance fails, and indicators of wetland soil and hydrology are present, the Prevalence Index is calculated.</p>
			<p>Prevalence Index: A weighted average of the percent cover for each indicator status is calculated (see data sheets in Attachment 3 of this technical memorandum). An index of 3 or less is considered meeting the hydrophytic vegetation criterion. If the Prevalence Index is not met, then consideration is given to morphological adaptations and/or non-vascular plants.</p>
			<p>Morphological Adaptations/Non-Vascular Plants: Some plants develop recognizable morphological adaptations when occurring in wetland areas. These features must be observed on >50 percent of the individuals of the FACU listed species living in an area where indicators of hydric soil and wetland hydrology are present. Wetland non-vascular plants can include bryophytes (mosses, liverworts, hornworts). The cover of wetland bryophytes must be >50 percent of the total bryophyte cover in a plot in coastal Washington forested wetlands.</p>
Wetland Soil ^a	<p>Soils are classified as hydric, or they possess characteristics that are associated with reducing soil conditions. A hydric soil is formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part of the soil.</p>	<p>Hydric soil has an identifiable color pattern, which occurs if the soil is saturated, flooded, or ponded for a long period of time. Faint or washed-out colors typically form in the soil, and mottles of bright color, such as rust (known as redoxymorphic features) form. Accumulations of organic matter at the surface, a sulfur odor, and organic matter stains may also be present.</p>	<p>A shovel is used to dig holes at least 20 inches below ground surface (bgs) at multiple locations in the study area. Direct observation of the soil is made at multiple locations in both wetlands and uplands, as applicable. Soil organic content is determined visually and texturally, and soil color is determined using the Munsell soil color chart (Munsell Color 2009). Depth to water saturation and/or inundation is also observed. The characteristics observed are compared to the hydric soil indicators for "all soils," "sandy soils," and "loamy clayey soils," as described in the USACE Regional Supplement (USACE 2010).</p>
Wetland Hydrology ^b	<p>The area is inundated either permanently or periodically at mean water depths less than or equal to 6.6 feet,</p> <p>or</p> <p>The soil is inundated or saturated to the surface for at least 14 consecutive days during the growing season^c.</p>	<p>Primary indicators of wetland hydrology include surface inundation (standing water), saturated soil, watermarks, drift lines, sediment deposits, and drainage patterns. Secondary indicators of hydrology include water-stained leaves, oxidized root channels, or local soil survey data for identified soil. In the absence of any primary indicators, at least two secondary indicators are required to meet the wetland hydrology criterion.</p>	<p>During soil investigation, soil pits are allowed to stand for up to 20 minutes to allow percolation of any groundwater into the pit to determine groundwater level for the soil profile. Additional digging may occur to 24 inches bgs during the dry season to investigate groundwater levels. In addition, the extent of soil saturation and presence/absence of oxidation are determined in the soil removed as part of the soil sample. Other indicators of wetland hydrology are observed at ground surface.</p>

^aUSACE 1987, 2010; U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) 2011.

^bUSACE 1987, 2010.

^cThe growing season is the time during which two or more non-evergreen vascular plant species growing in a wetland or surrounding area exhibit biological activity, such as new growth. Growing season can also be determined by soil temperature. The growing season identified on the project area WETS table is February 6 to December 9.

Table 2
Summary of February 9, 2022 Wetlands and Waterways Site Reconnaissance
SR 99 at South 373rd Street
Federal Way, Washington

Type	Wetland/ Waterway ID (Refer to Figure 3)	Approximate Dimensions (a)	General Characteristics/Observations at Time of Site Reconnaissance			Mapped by NWI/City?	Classification (Wetland = Cowardin/HGM; Stream = Hydrology)	Preliminary Category (c) and Standard Buffer Width	Notes
			Soils	Vegetation (b)	Hydrology				
Wetland	Wetland A	1.75 ac	Not accessible	<ul style="list-style-type: none"> Red alder (<i>Alnus rubra</i>, FAC) Broad leaf cattail (<i>Typha latifolia</i>, OBL) Himalayan blackberry (<i>Rubus armeniacus</i>, FAC) Reed canary grass (<i>Phalaris arundinacea</i>, FACW) 	Saturation, inundation.	Yes	PSS/ Depressional	Category III; 80 ft	Property not accessible at time of reconnaissance. Wetland extent identified is based on City mapping and area observable from public right-of-way.
	Wetland B	7.4 ac	Depleted matrix	<ul style="list-style-type: none"> Red alder (<i>Alnus rubra</i>, FAC) Himalayan blackberry (<i>Rubus armeniacus</i>, FAC) Lamp rush (<i>Juncus effusus</i>, FACW) Reed canary grass (<i>Phalaris arundinacea</i>, FACW) Nootka rose (<i>Rosa nutkana</i>, FAC) Cottonwood (<i>Populus balsamifera</i>, FAC) 	Saturation, inundation.	No	PFO/ Depressional	Category II; 150 ft	Wetland extent identified is based on City mapping and area observable from public right-of-way.
	Wetland C	0.3 ac	Not accessible	<ul style="list-style-type: none"> Not accessible 	Not accessible, refer to Notes	Yes, refer to Notes	PFO/ Depressional	Category III; 80 ft	Property not accessible at time of reconnaissance. Wetland extent identified is based on City mapping. Aerial photography suggests portion of mapped wetland may be developed.
	Wetland D	1.4 ac	Not accessible	<ul style="list-style-type: none"> Douglas meadow sweet (<i>Spiraea douglasii</i>, FACW) Refer to Notes 	Not accessible, refer to Notes	Yes, refer to Notes	PFO/ Depressional	Category III; 80 ft	Property not accessible at time of reconnaissance, although portion of wetland observed from right-of-way. Wetland extent identified is based on City mapping.
	Wetland E (WSDOT Spring Valley Mitigation)	Refer to Notes	Not accessible	<ul style="list-style-type: none"> Refer to Notes 	Not accessible, refer to Notes	Yes	PFO/Depressional	Refer to Notes	Property not accessible at time of reconnaissance. Wetland information to be requested from WSDOT if needed in support of project permitting.
Waterway	Waterway 1	625 linear ft	Not applicable	Not applicable	Flowing at time of reconnaissance	Yes (City)	Intermittent	Type F; 100 ft	Type F determination based on physical characteristic observed at time of reconnaissance in accordance with WAC 222-16-031. The bankful width was estimated greater than 2 ft.
Ditches (refer to Notes)	N/A(d)	970 linear ft	(e)	<ul style="list-style-type: none"> Reed canary grass (<i>Phalaris arundinacea</i>, FACW) Water cress (<i>Nasturtium officinale</i>, OBL) 	Saturation, inundation, drainage pattern.	No	PEM/ Slope	N/A (refer to Notes)	Ditches satisfying wetland parameters or containing ordinary high water mark that drain to other waters of the US are subject to jurisdictional determination under Section 404 of the Clean Water Act. Ditches observed appear to drain to wetlands and/or streams. Ditches are not subject to City critical areas regulation and no buffers are prescribed (refer to Attachment 1).
<p>a. Dimensions subject to delineation of feature. b. Vegetation identified may not be inclusive of all species present. c. Wetland ratings to be confirmed based on delineation field effort. d. Ditches were not separated as individual units during reconnaissance level assessment. e. Soils in ditches not evaluated at time of reconnaissance due to prominence of hydrophytic vegetation and hydrology.</p>									

Regulatory Overview

ATTACHMENT 1 REGULATORY OVERVIEW

Wetlands and certain waterways are regulated by federal, state, and local governmental agencies, and compliance with one agency does not necessarily fulfill the permitting requirements of any other agency. All wetlands and waterways presented in this technical memorandum are subject to verification and jurisdictional determination by the US Army Corps of Engineers (USACE), Washington State Department of Ecology (Ecology), and the City of Federal Way (City). Chapter 19.145 of the Federal Way Revised Code (FWRC) contains requirements for establishing wetland and waterway buffer widths and building setbacks and requirements for any alterations, including fill of wetlands, streams, and their buffers. Ecology requires compliance with the State Water Pollution Control Act [Revised Code of Washington (RCW) 90.48], and it has administrative oversight of Section 401 of the Clean Water Act for water quality certification in the case of impacts to USACE jurisdictional “waters of the U.S.” Any work that will use, divert, obstruct, or change the bed or flow of state waters, including streams and rivers, must do so under the terms of a Hydraulic Project Approval (HPA) issued by the Washington Department of Fish and Wildlife (WDFW). The WDFW HPA is administered under RCW 77.55 and rules set forth in Chapter 220-110 Washington Administrative Code (WAC).

“Waters of the U.S.,” as defined in 40 Code of Federal Regulations (CFR) 230.3(s), include but are not limited to wetlands, rivers, streams, lakes, or ponds. “Waters of the state,” as defined in RCW 90.48.20, include lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

As indicated in Title 19, Chapter 19.05.230 FWRC, wetlands are “...those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, ponds, bogs and similar areas. Regulated wetlands do not include those artificial wetlands intentionally created from nonwetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands created as mitigation and wetlands modified for approved land use activities shall be considered as regulated wetlands.”

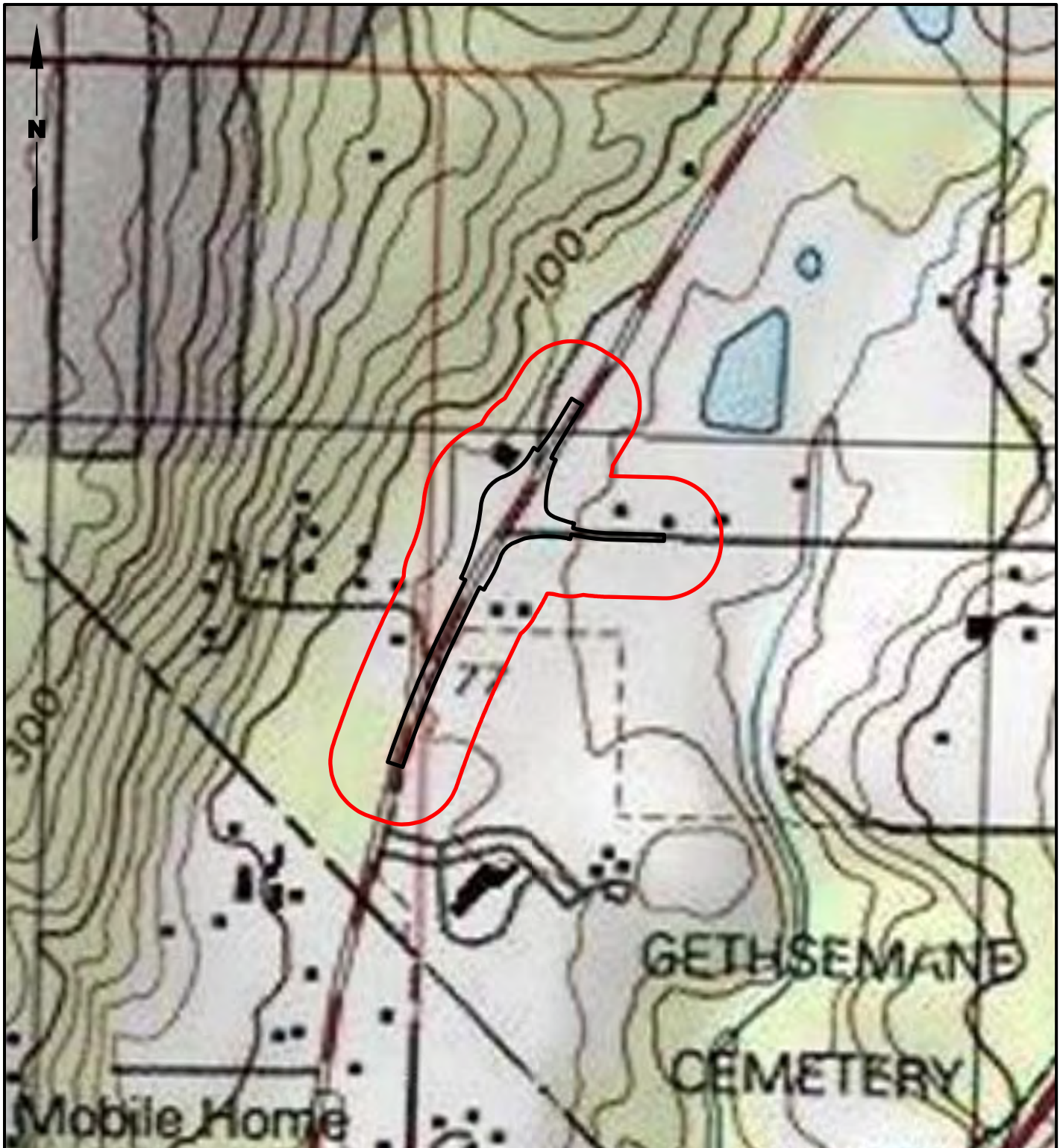
As indicated in Title 19, Chapter 19.190 FWRC, a stream is, “...a course or route, formed by nature, including those which have been modified by humans, and generally consisting of a channel with a bed, banks or sides throughout substantially all its length, along which surface waters naturally and normally flow in draining from higher to lower elevations. A stream need not contain water year-round. In a development, streams may run in culverts or may be channeled in a concrete, rock or other artificial conveyance system. This definition does not include irrigation ditches, stormwater facilities or other artificial watercourses unless they are used by resident or anadromous salmonid

fish, or the feature was constructed to convey a natural stream which existed prior to construction of the watercourse. Those topographic features that resemble streams but have no defined channels shall be considered streams when hydrologic and hydraulic analyses done pursuant to a development proposal predict formation of a defined channel after development...". Furthermore, ditches are excluded from regulation as streams, unless they are used by fish. Ditches are artificial drainage features created in uplands through purposeful human action, such as irrigation and drainage ditches, grass-lined swales, and canals.

The USACE and US Environmental Protection Agency (EPA) assert jurisdiction over waterways and wetlands based on proximity (adjacency) to a traditionally navigable water or a significant ecological nexus to relatively permanent water (USACE and EPA 2007). Upon confirmation of parameters present during the growing season, the wetlands/waterways identified in this technical memorandum are likely jurisdictional features due to wetland parameters present and nexus to Commencement Bay (Puget Sound) via Hylebos Creek and West Hylebos Creek. "Waters of the U.S" generally do not include stormwater features constructed in uplands that do not intercept runoff from "waters of the U.S."

All "waters of the U.S." described in this technical memorandum are subject to verification by the USACE. Those wetlands determined to be "isolated" do not fall under the jurisdiction of the USACE. Only the USACE can determine if a wetland is adjacent or isolated. If the wetlands are determined to be isolated, they may still be subject to regulation by Ecology under the State Water Pollution Control Act (RCW 90.48) and Chapter 19.145 of the FWRC.

Background Review Figures

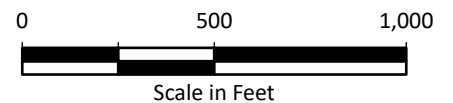


Legend

- Study Area
- Project Area

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.



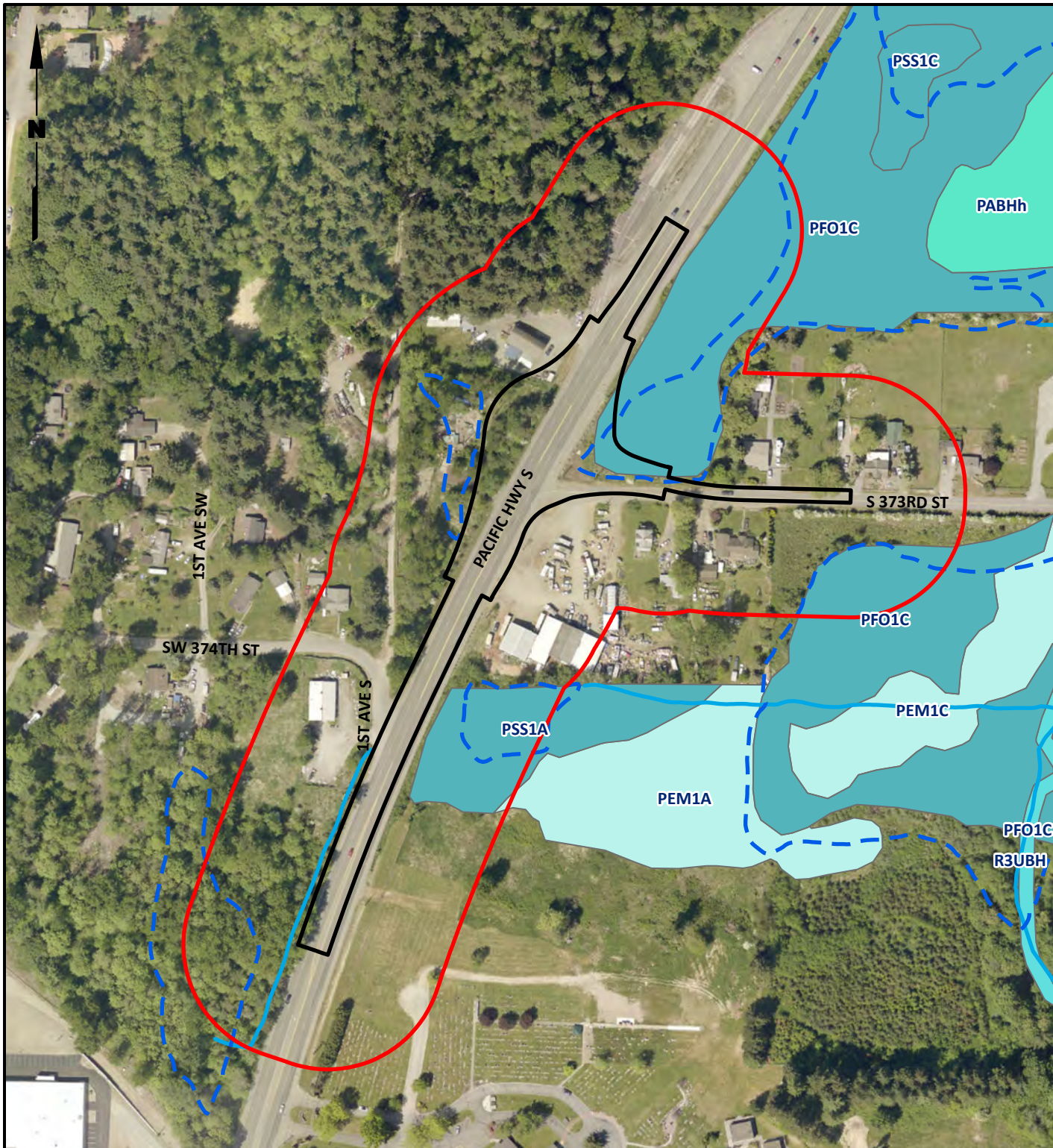
Data Source: USGS.

Pacific Highway at S 373rd Street
Roundabout Project
Federal Way, Washington

USGS Topographic Map

Figure
2-1

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Legend

- ▭ Study Area
- Project Area
- Tax Parcels
- City of Federal Way Wetlands
- City of Federal Way Streams
- PEM1A/PEM1C - Freshwater Emergent Wetland
- PSS1A/PSS1C/PFO1C - Freshwater Forested/Shrub Wetland
- PABHh - Freshwater Pond
- R3UBH - Riverine

Note

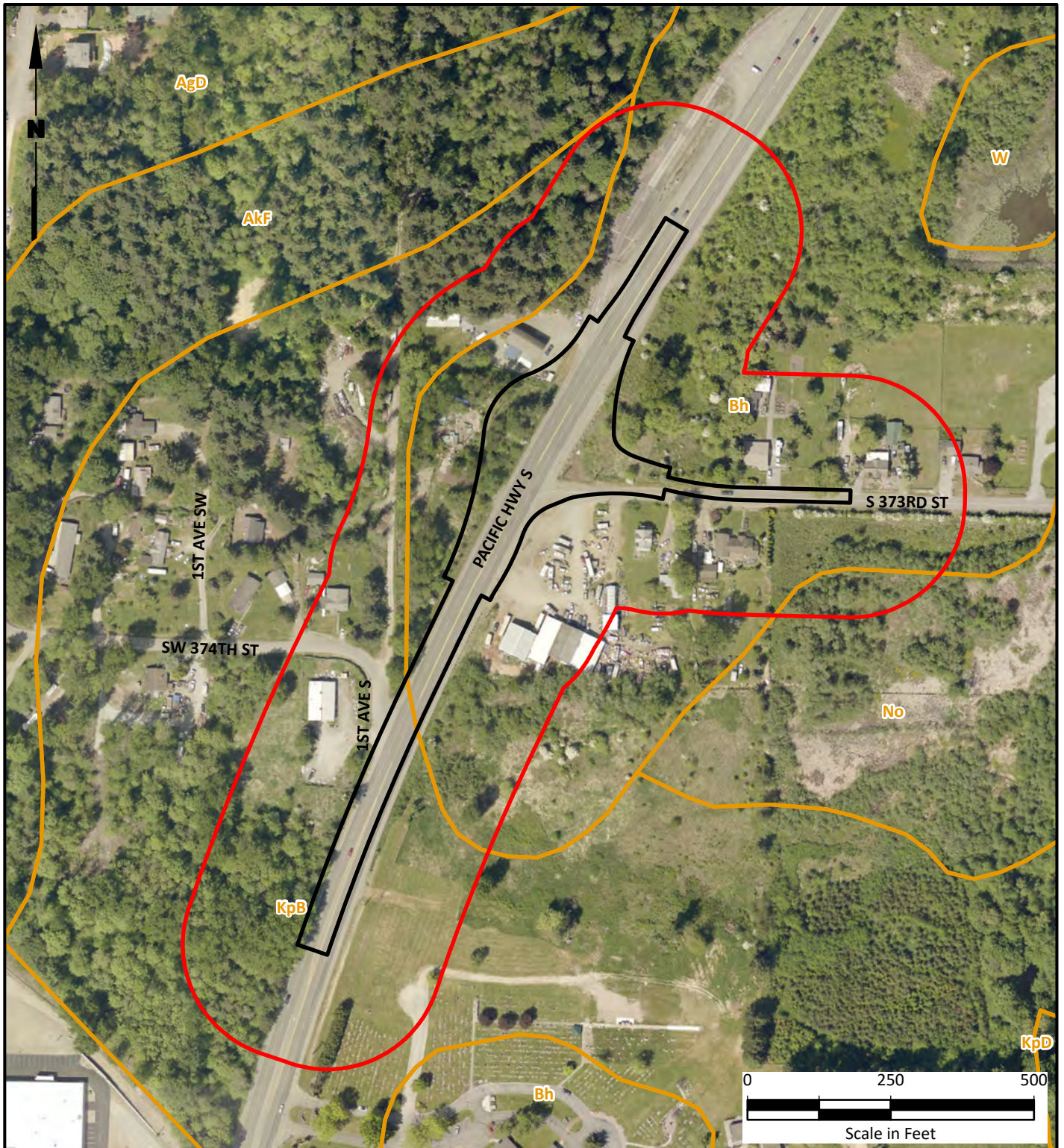
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.



Data Sources: City of Federal Way GIS; King County GIS; USFW.

Scale in Feet

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Legend

- ▭ Study Area
- Project Area
- Soil Type

Soils Key

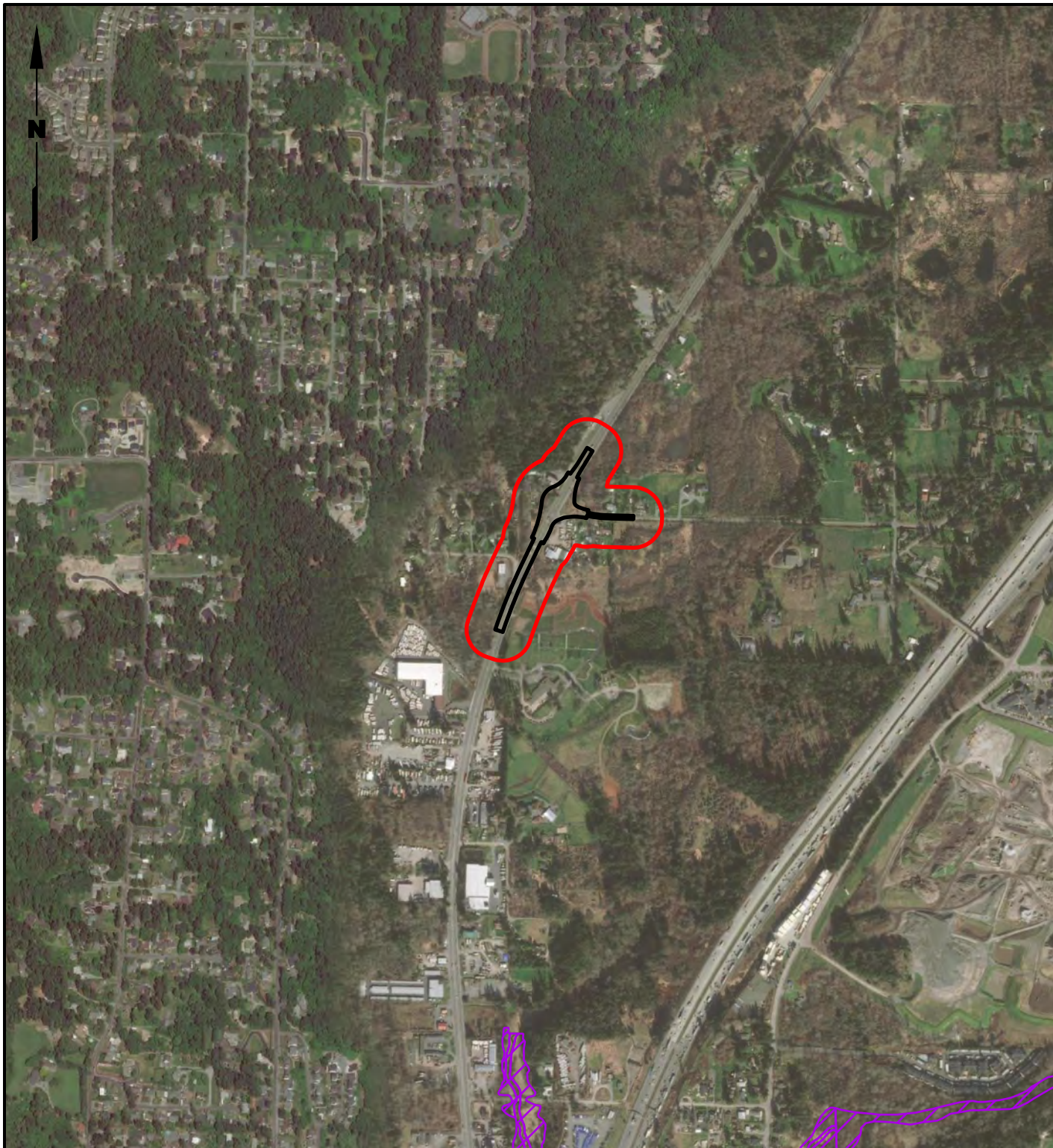
- AgD = Alderwood Gravelly Sandy Loam, 15-30% Slopes
- AkF = Alderwood and Kitsap Soils, Very Steep
- Bh = Bellingham Silt Loam
- KpB = Kitsap Silt Loam, 2-8% Slopes
- KpD = Kitsap Silt Loam, 15-30% Slopes
- No = Norma Sandy Loam
- W = Water

Note


1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Data Sources: King County GIS; USDA NRCS.

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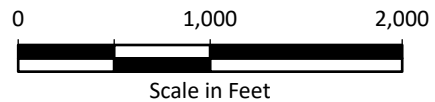


Legend

 100-Year Floodplain

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.



Data Source: FEMA; Esri World Imagery.

Pacific Highway at S 373rd Street
Roundabout Project
Federal Way, Washington

100-Year Floodplain Map

Figure
2-4

**Natural Resources Conservation Service
Rainfall Documentation Worksheet**

Figure 19-7 Rainfall documentation worksheet

Rainfall Documentation (use with photographs)

Date: 2/9/22

Weather station: _____ Landowner: _____ Tract no.: _____

County: King State: WA

Soil name: _____ Growing season: _____

Photo date: _____

		Long-term rainfall records							
	Month	3 yrs. in 10 less than	Normal	3 yrs. in 10 more than	Rain fall	Condition dry, wet, normal	Condition value	Month weight value	Product of previous two columns
1st prior month*	1	3.58	5.13	6.10	7.06	W	3	3	9
2nd prior month*	12	3.94	5.62	6.68	4.08	N	2	2	4
3rd prior month*	11	4.10	5.90	7.02	10.26	W	3	1	3
								Sum	15

* Compared to photo date

Note: If sum is

6 - 9 then prior period has been
drier than normal

10 - 14 then prior period has been
normal

15 - 18 then prior period has been
wetter than normal

Condition value:

Dry =1

Normal =2

Wet =3

Conclusions: