FINDLAY IMPACT ANALYSIS AND MITIGATION PLAN

Shoreline Permit –Shoreline Protection Repair Project

10227 SW Tillicum Lane, Vashon, WA 98070

Project Application SHOR24-0045

Prepared by

LEON Environmental, LLC

February 2026

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Abbreviations and Acronyms

CY	cubic yards
Ecology	Washington Department of Ecology
FEMA	Federal Emergency Management Agency
FT	feet/foot
GIS	Geographic Information System
HTL	high tide line
KCC	*King County Code*
L-E	Leon Environmental, LLC
LF	linear feet
OHW	ordinary high water
PHS	Priority Habitat and Species
SF	square feet/foot
USFWS	U.S. Fish and Wildlife Services
WDFW	Washington Department of Fish and Wildlife

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Chapter 1. General Information/Background

1.1 Project Summary

This impact analysis and mitigation plan was requested by King County to address potential impacts to the critical areas and buffers from the project. The property owners are proposing to replace the existing shoreline protection that has been damaged by age and storms. The proposed work includes removing the timber bulkhead and beach access stairs, and the installation of a setback bulkhead, habitat features (anchored logs, glacial erratic, WDFW-approved beach nourishment) and native riparian plantings. The existing beach access stairs will also be replaced with a beach access trail that terminates above HTL/OHW.

The proposed work was designed to avoid and minimize new impacts to critical areas and buffers to the greatest extent practicable. To meet this goal, Leon Environmental, LLC (L-E) was hired to perform a critical area review to identify potential critical areas and buffers on and adjacent to the project site. Based off L-E's background data review and site visits, the following critical areas and/or buffers are potentially present on the project site: erosion hazard; estuarine wetlands; flood hazard area; and aquatic area.

Project activities avoid new permanent impacts to critical areas by occurring landward of the existing bulkhead and above ordinary high water. Potential impacts to aquatic buffers will be minimized by conducting project related actions in areas of previous land use impacts and in the upland. The proposed project will result in a net reduction of impacts to the aquatic area (marine riparian) and the buffer by removing the existing treated timber bulkhead and stairs, and replacing it with a setback bulkhead, habitat features, and riparian plantings. The project will reestablish approximately 230 square feet of upper intertidal habitat, remove treated wood and replace invasive species with native plantings.

King County requires a critical area restoration and enhancement plan following the guidelines of King County's *Critical Areas: Restoration & Enhancement* (2012). The purpose of the critical area restoration and enhancement plan is to fulfill the requirements of KCC 21A.2.

1.2 Statement of Accuracy

A critical areas reconnaissance level review was performed. No wetland delineation, rating, and functional analyses, or stream delineation were conducted or prepared, because these critical areas were not present on the Findlay project site (Site). The maps included in this report were generated from field measurements, not a professional survey. The findings were based on the conditions at the time of the site visit and information provided by the property owners and their engineer. This report is provided for the use of the named recipient only and is not intended for use by other parties for any other purposes. The conclusions in this report are based on the results of analyses performed by L-E and represent our best professional judgment. To that extent, and within the limitations of project scope and budget, we believe the information provided herein is accurate and true to the best of our knowledge. We do not warrant any assumptions or conclusions not expressly made in this report, or based on information or analyses other than what is included herein.

1.3 Proposed Project

1.3.1 Location

The proposed project is located in Vashon, King County, Washington. The subject properties street address is 10227 SW Tillicum Lane, Vashon, WA 98070 (Figure 1). The project is proposed on Parcel Number 059400-0060, which is situated in Township 22 North, Range 3 East, Section 18, W.M.

To access the site, take Fauntleroy-Vashon Island Ferry to Vashon Island.
Take Vashon Hwy SW. Turn left on to SW Tillicum Lane. Arrive at 10227 SW Tillicum Lane, Vashon WA 98070. The project site is on the right.

1.3.2 Purpose and Description

Elements of the proposed project include:

- Removing the existing timber bulkhead;
- Replace beach access stairs with beach access pathway;
- Installing a setback bulkhead, large woody debris, and beach nourishment; and
- Replant invasive species with native plant material.

1.4 Background Data Reviewed

The background review for this project included researching existing information pertaining to the project site, which included maps, drawings, and reports. This review focused on information related to soils, hydrology, vegetation, and previously identified wetlands and other critical areas. The following is a list of resources reviewed for this project:

- Aerial photograph and topographic map of the site;
- King County Geographic Information System (GIS);
- Washington Department of Fish and Wildlife (WDFW) Salmonscape and Priority Habitat and Species (PHS) data for the property and adjacent areas; and
- Washington Department of Ecology (Ecology) Coastal Atlas data for the property and adjacent areas.

1.5 Field Investigation

An L-E biologist performed an initial site visit on March 4, 2024. Conditions were cloudy with rain. The biologist evaluated site conditions for approximately 1 hour. The site visit consisted of examining overall site conditions, including characterizing general soil characteristics, vegetation, potential critical habitats, and the presence of species of concern.

Bill Rehe, L-E Senior Associate Biologist, led the initial site visit. Mr. Rehe is a professional fisheries and wetland biologist with over 30 years of experience in the Northwest. Mr. Rehe holds 4-year and advanced degrees in fisheries science. His areas of expertise include marine and nearshore ecology, salmon biology, wetland science, and forage fish ecology. In addition to formal training at accredited universities, he has received training by Ecology, WDFW, National Marine Fisheries Service, and U.S. Fish and Wildlife Service (USFWS).

Chapter 2. Summary of Existing Conditions

King County Code (KCC) 21A.24.045 allows alterations within the following seven critical areas and their buffers if the alteration complies with: the development standards; impact avoidance and mitigation requirements; and other applicable requirements. Those seven critical areas include: Critical aquifer recharge areas; Coal mine hazard areas; Erosion hazard areas; Flood hazard areas; Landslide hazard areas; Seismic hazard areas; and Volcanic hazard areas. Within these seven critical areas and their buffers, alterations are further limited in: Severe channel migration hazard areas; Landslide hazard areas over forty percent slope; Steep slope hazard areas; Wetlands; Aquatic areas; Wildlife habitat conservation areas; and Wildlife habitat networks. The purpose of this chapter is to identify potential critical areas, and their buffers present on the subject property through the review of existing information and by site review.

2.1 Background Review of Existing Information

This section describes the results of office review and field investigations. For the purpose of this report, the term “vicinity” describes an area approximately ¼ mile around the Project Site.

2.1.1 GIS Database

King County GIS iMap identifies the following potential critical areas: erosion hazard; estuarine wetlands; flood hazard area; and aquatic area. There are no known streams, seismic hazards, steep slopes hazard areas; landslide hazards or coal mine hazards (Appendix A).

2.1.2 Previous Land Use

According to King County records, 10227 SW Tillicum Lane has a 2,410 SF home built in 2005. The years the bulkheads were built are unknown, but it appears in the 1977 Ecology shoreline photos (Appendix B).

2.2 Analysis of Existing Site Conditions

There are no freshwater wetlands on or directly adjacent to the project site. There are also no streams, ponds, or lakes. King County GIS database, iMap, cites the following features present on or adjacent to the project site: erosion hazard; estuarine wetlands; flood hazard area; and aquatic area There are no intertidal estuarine wetlands present, but aerial photos appear to indicate the possible presence of subtidal estuarine wetlands adjacent to the existing bulkhead.

King County identifies a 165-foot aquatic buffer on the project property. The aquatic buffer begins at OHW of the Puget Sound and extends towards Vashon Highway (Figure 2). The aquatic buffer has been modified due to previous development, leaving primarily landscaping species, lawn and invasive species. According to Ecology aerial photos, most of these impacts appear to have occurred on or before the 1970s.

Chapter 3. Critical Areas and Buffer Impact Analysis

3.1 Potential Project Impacts

The maintenance and repair of the existing shoreline protection will occur as far landward as practicable. Once complete, the shoreline protection will be of a similar size, shape, configuration, location, and general external appearance. Project activities will result in a cumulative reduction of impacts, reestablish approximately 230 SF of upper intertidal habitat, remove approximately 60 SF of beach access stairs, installation of 300 SF of habitat features and planting 378 SF of marina riparian buffer (Table 2).

3.2 Assessment of Development Impacts

3.2.1 Critical Area Impacts

The following King County critical areas are present on the project site: erosion hazard; estuarine wetlands; flood hazard area; and aquatic area. The proposed project will have no new direct impacts to these critical areas.

3.2.2 Buffer Impacts

The proposed project site is adjacent to Puget Sound; an aquatic area with a 165-foot marine riparian buffer. The buffer starts at the line of OHW and extends towards Vashon Highway (Figure 2). Impacts in the aquatic buffer will be minimized to the greatest extent possible but cannot be fully avoided because of the location of the shoreline work. The area directly behind the existing bulkhead appears to be upland fill.

The proposed project will include removing the existing timber bulkhead and stairs, installation of a rock setback bulkhead as far landward as practicable, and the installation of LWD and native riparian vegetation.

Table 1. Overall Proposed Project Action Impacts to Known Critical Areas and Aquatic Buffers

Project Action	Location of Impact	Area (SF)
Repair existing bulkhead	Aquatic Buffer	230
	TOTAL	**230**

Chapter 4. Proposed Mitigation

4.1 Proposed Mitigation

The proposed mitigation for the project includes avoidance and minimization techniques that follow KCC 21A.24.125. Additional impacts to critical areas were avoided and minimized by not expanding the footprint of the bulkhead into aquatic areas or undisturbed critical areas. Unavoidable impacts to the aquatic buffer will result in approximately 230 SF of impacts to the area between the existing bulkhead and the home. These impacts are the result of moving the shoreline protection, beach access, and habitat features above OHW. Compensatory mitigation to offset potential project action impacts include reestablishing upper intertidal habitat, removing treated wood beach access stairs, installing habitat features and native riparian plantings (Appendix C).

4.2 Mitigation Design Elements

Mitigation design elements consist of four primary elements: reestablishing upper intertidal habitat, removal of the beach access stairs, the placement of habitat features (LWD, glacier erratics) and native riparian plantings. These elements are described below.

4.2.1 Mitigation for Marine Riparian Buffer Impacts

The property owners propose to reestablish 230 SF of upper intertidal habitat, remove 60 SF of treated woods beach access stairs, install 300 SF of habitat features above OHW and plant 378 SF of native riparian vegetation (Table 2).

Table 2. Mitigation for Project Impacts to Marine Riparian Buffer

Impacted Area	Area (SF)	Mitigation	Area (SF)
Marine Riparian Buffer	230	Place repaired bulkhead landward of the existing toe of the shoreline protection.	230
		Remove beach access stairs	60
		Install habitat features	300
		Native riparian planting	378
TOTAL	**230**	**TOTAL**	**968**

Chapter 5. Mitigation Goals, Objectives, and Performance Standards

5.1 Mitigation Summary for Bulkhead Repair Project

The mitigation goals of this project are to avoid and minimize new impacts to the aquatic buffer to the greatest extent possible. The project was designed to avoid and minimize adverse impacts to the aquatic environment by only performing the minimum amount of work necessary to protect the shoreline. The contractor will avoid and minimize adverse impacts to the project area by working during the authorized regulatory agency "work windows." The project was designed to minimize adverse impacts by only working in the work corridor, in the dry at low tide, and not stockpiling fine-grained material below OHW. The barge will not ground out in any aquatic vegetation, and the tug will operate in a manner to reduce prop wash.

While the work area has been limited to the smallest area possible, there will be unavoidable impacts from the proposed project actions that require compensatory mitigation. Specifically, the applicant proposes to mitigate for the approximately 300 SF of potential impacts within the aquatic buffer by reestablishing upper intertidal habitat, removing beach access stairs, installing habitat features and native vegetation.

The success of these mitigation goals will be evaluated through specific objectives and measurable performance standards. These objectives and performance standards are defined in Chapter 5.2.

5.2 Mitigation Goal and Objectives

The goal of the proposed mitigation is to offset temporary impacts to the marine riparian buffer from project actions. To achieve this goal, we are proposing the following:

- Reestablish 230 SF of upper intertidal habitat,
- Remove 60 SF of treated woods beach access stairs,
- Install 300 SF of habitat features above OHW; and
- Plant 378 SF of native riparian vegetation

Objectives, performance standards, and final success criteria for proposed mitigation for potential project impacts are identified in Table 3.

Table 3. Summary of Objectives, Performance Standards and Final Success Criteria for Mitigation for Repairing Existing Bulkhead

Mitigation Goal	Functional Objective	Performance Standard	Parameter Measured	Year Inspected	Sampling Method
Mitigate for temporary impacts to marine riparian buffer area	Reestablish upper intertidal habitat	Remove at least 230 SF of intertidal fill	Photograph and measurements	0 (as-built)	Before and after direct measurements
Mitigate for minor impacts to	Reestablish upper intertidal habitat and reduce	Remove existing beach access stairs	Photograph	0 (as-built)	Before and after direct measurements

Mitigation Goal	Functional Objective	Performance Standard	Parameter Measured	Year Inspected	Sampling Method
marine riparian buffer area	impacts to shoreline processes				
Mitigate for minor impacts to marine riparian buffer area	Improve nearshore habitat diversity	Install habitat features	Photograph	0 (as-built)	Visual assessment
Mitigate for minor impacts to marine riparian buffer area	Plant 378 SF of native vegetation within marine riparian buffer	Photograph and document native vegetation planted	Photograph and document after plantings installed	0 (as-built)	Visual assessment
		No more than 10% aerial coverage by invasive species	Aerial coverage	1,2,3,4, and 5	Canopy coverage
		Minimum of 10% aerial coverage at year 1, 20% at year 2, 30% at year 3, 40% at year 4 and 50% at year 5	Aerial coverage	1,2,3,4, and 5	Canopy coverage
		Approximately 1 species of trees, 8 shrubs, 1 grass, and 2 groundcovers	Species composition	1,2,3,4, and 5	Visual assessment
		100% survival in Years 1, 2, & 80% in Years 3, 4, 5	Direct count of living and dead species	1,2,3,4, and 5	Visual assessment

Chapter 6. Mitigation Monitoring Approach

Confirmation that the mitigation goal, objectives, and performance standards were met will be accomplished by photograph and direct measurement. As required in the *Critical Areas: Restoration and Enhancement in King County* (2012), these measurements will be recorded and transmitted to King County by submission of an as-built report. The as-built report will reflect the actual impacts and placement of soil and native plants.

6.1 Monitoring and Reports

6.1.1 As-Built Report

Within 90 days of completion, the Findlay's or their representative will prepare and submit an as-built report to the King County. This report will document the as-built conditions and describe any deviations from Table 3. The as-built report will describe any potential problems identified during construction activities and any recommended remedies to be proposed to King County. The as-built report will also include an as-built drawing (not a survey prepared by a licensed land surveyor) documenting the physical conditions of the site after construction, and photographs of the mitigation.

6.1.2 Monitoring Reports

For each monitoring year, a simple monitoring report will be submitted annually to King County to verify survival of the native plantings. The simple monitoring report will include verification of slide debris removal.

6.1.3 Monitoring Schedule

A post-construction (as-built) inspection will be conducted within 90 days of completing native vegetation installation (year 0). Monitoring of the site will be conducted in years 1, 2, 3, 4 and 5, as required. Vegetation monitoring activities will be conducted during the summer (July or August).

6.1.4 Mitigation Site Closeout

When the site has reached the end of its specified monitoring period and/or achieved final performance standards, the applicant will request that it be closed out (i.e., the site be accepted by King County as a success and further monitoring work ceased). The applicant or their qualified representative will prepare and submit a final monitoring report or closeout report to King County to establish that this milestone has been reached. The submittal will explain the rationale for closing out the site.

6.2 Adaptive Management and Contingency Plan

6.2.1 Adaptive Management Plan

The adaptive management plan outlines maintenance activities that will be undertaken by the applicant to ensure the long-term success of the site. These maintenance activities may include (but not be limited to) invasive vegetation removal, or additional vegetation planting. In the event

that additional planting is necessary, plants will be installed during the dormant period from October through March. Maintenance and adaptive management activities conducted by the applicants, or their qualified representative will be summarized in the monitoring reports submitted to King County

6.2.2 Contingency Plan

This contingency plan provides a framework for taking more aggressive action if the site fails to meet a performance standard for more than two consecutive monitoring events for a specific objective or fails to meet the final success criteria for a specific objective. The contingency actions will vary depending on whether physical or biological processes are responsible for not attaining performance standards, and the degree of shortfall. If the failure of achieving a performance standard is minor, and King County agrees, the issue may continue to be addressed within the scope of the adaptive management plan.

The contingency plan identifies a planning process for selecting appropriate actions to address large-scale failure or anticipated failure of final success criteria for a specific objective. In order to maintain the flexibility needed to respond effectively and appropriately to biological and/or physical conditions, this plan does not present a complete list of actions that will be taken to remedy all types of failures at the site. Rather, sample options are outlined below. The list of sample corrective actions is not exclusive, nor is it a commitment to undertake a specific action.

Large-scale failure of biological components of the site is more difficult to predict; therefore, specific responses are impractical to detail. The following general approaches are anticipated:

- If planted vegetation fails to meet the canopy cover standards, additional planting may occur.
- If vegetation planted within the aquatic buffer fails to meet the canopy cover standards due to incompatible hydrologic regime (i.e. too much or not enough water), additional planting of different species more appropriate to the actual hydrologic regime may occur.
- If non-native invasive weed species exceed canopy cover standards despite adaptive management actions, large-scale planting with taller canopy species or addition of mulch may occur to shade out invasives.

Chapter 7. Financial Guarantees

Per *Permitting Customer Information Bulletin #40, Financial Guarantees*, financial guarantees, if necessary, may be required to ensure that the mitigation plan is fully implemented.

Chapter 8. References

King County. 2012. *Critical Areas: Restoration and Enhancement*.

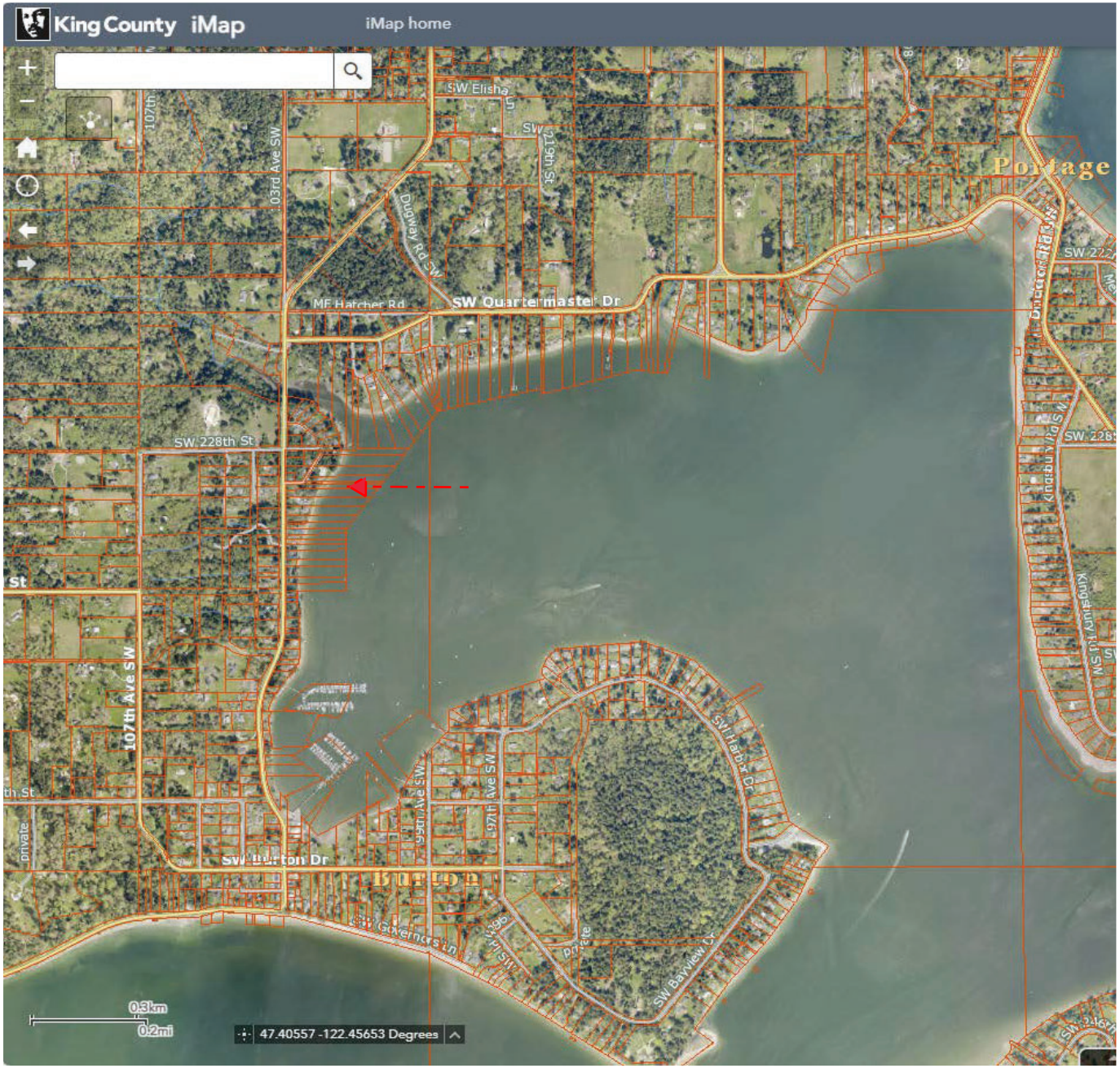
Figures

FINDLAY

Bulkhead Repair

Figure 1. Vicinity Map

February 2026



Data Sources: iMap (2025))

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Bulkhead Repair

Figure 2.

Aquatic Buffer

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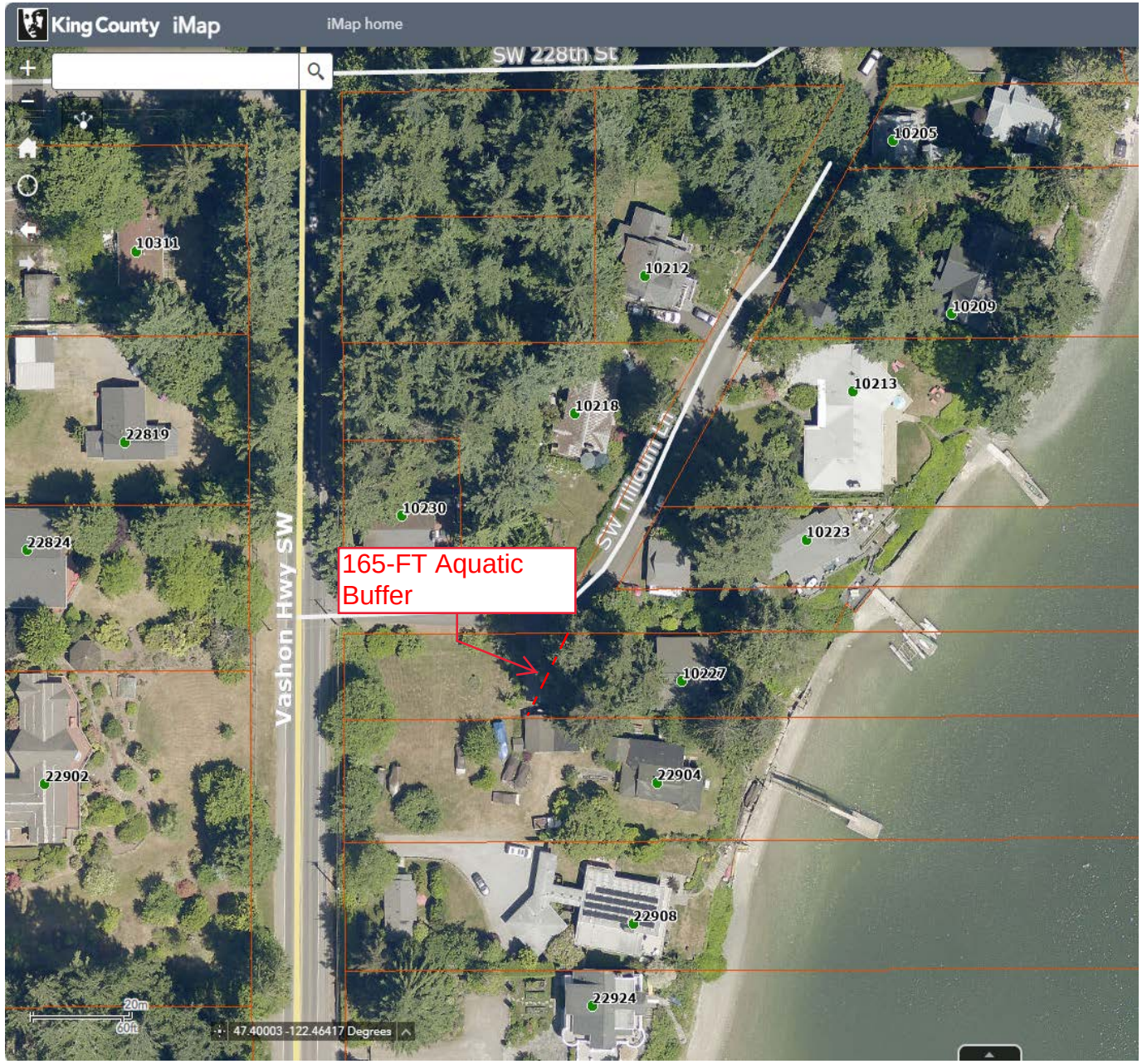

Data Sources: iMap (2025)

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