Aquatic Critical Areas Assessment and Macrovegetation/Eelgrass Survey

Port of Ilwaco
Ilwaco, Washington

for
Moffatt & Nichol

August 29, 2022

GeoEngineers

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Port of Ilwaco
Ilwaco, Washington

File No. 21551-003-01

August 29, 2022

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JLD:JPS:ERH:FMM:tlm

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1.0 INTRODUCTION AND PROJECT UNDERSTANDING

GeoEngineers, Inc. (GeoEngineers) was contracted by Moffatt & Nichol on behalf of the Port of Ilwaco (Port) to perform wetland and stream delineation services and a macrovegetation/eelgrass survey for the Port of Ilwaco Dredging and Dredge Material Placement Project (project). The project and survey areas are located within Baker Bay, within and adjacent to the mouth of the Columbia River in Ilwaco, Washington (Figure 1, Vicinity Map). The Port of Ilwaco is proposing to dredge the marina basin as part of their ongoing maintenance to maintain marina operations, and potentially place dredge materials along the Baker Bay shoreline to the northeast of the marina.

This report has been prepared to summarize habitat surveys completed to document baseline habitat conditions (wetland, stream and estuarine macrovegetation) that may be affected by proposed project elements in accordance with Ilwaco Municipal Code (IMC) Chapter 15.18 (Critical Areas Ordinance) and according to the City of Ilwaco's Shoreline Master Program (SMP) (IMC Chapter 15.14). Per Washington Administrative Code (WAC) 220-110-250(3)(a,b), eelgrass and macroalgae are saltwater habitats of special concern and per IMC Chapter 15.14 they are critical saltwater habitats and therefore project proponents are required to document proximity of these habitats within the footprint and vicinity of the project. The habitat surveys included an eelgrass/macroalgae and wetland survey within the marina and within and adjacent to the proposed beneficial use site (proposed dredge disposal area). Both of these distinct survey areas are shown on Figure 1. The approximate marina dredge basin area is 62 acres, and the proposed beneficial use site encompasses a 78-acre area.

1.1. Project Location and Site Description

The project site is located at the Port of Ilwaco Marina at 165 Howerton Avenue, adjacent to the Columbia River (Figure 1). The proposed beneficial use site is located northeast of the marina on the Columbia River shoreline. The project area is bordered to the north by businesses, single-family homes and roadways and bordered to the south by the Columbia River. The project is located within Water Resources Inventory Area (WRIA) 24 (Willapa), and Section 34 of Township 10 North and Range 11 West of the Willamette Meridian (W.M.).

The general vicinity of the marina has been heavily influenced by development and recreational uses (marina and boating). Structures and development within the marina include docks, piers and riprap bulkheads.

2.0 DATA REVIEW

Environmental maps of the project area were collected and reviewed as part of a paper inventory. The United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) online mapper (USFWS 2022) depicts an estuarine wetland along the shoreline within the project area. The United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey identifies the marina and proposed beneficial use site areas as located in water and there is no soil type listed (USDA-NRCS 2022). NWI and soil survey information are included in Appendix A, Published Data Review.

Additional information was obtained from the Washington State Department of Natural Resources (DNR) Forest Practices Application Mapping Tool (FPAMT) and Washington Department of Fish and Wildlife (WDFW) Priority Habitat and Species (PHS) data (DNR 2022; WDFW 2022). FPAMT depicts the marina as the Columbia River (a shoreline waterbody), maps a fish-bearing stream flowing into the northwest corner of the marina and maps another fish-bearing stream flowing into and through the proposed beneficial use site (DNR 2022). WDFW PHS data depicts the following priority species and habitats within ½-mile of the marina (WDFW 2022):

- Marbled murrelet (*Brachyramphus marmoratus*);
- Purple martin (*Progne subis*);
- Shorebird Concentrations;
- Waterfowl Concentrations;
- Wetlands;
- Estuarine and Marine wetlands;
- Freshwater Emergent Wetlands; and
- Freshwater Forested/Shrub Wetlands.

The U.S. Army Corps of Engineers (USACE) performed a comprehensive eelgrass survey of subtidal habitats within Baker Bay and Chinook in 2015 using BioSonics MX Aquatic Habitat Echosounder technologies. This survey documented a small population of eelgrass to the east of Sand Island (located approximately 2.6 miles southeast of the Ilwaco Marina) and larger beds to the west near Chinook (USACE 2015). The 2015 USACE survey did not include the marina or proposed beneficial use site but their findings document habitat in the vicinity of the project areas.

3.0 MACROVEGETATION/EELGRASS DELINEATION

The eelgrass/macrovegetation survey covered two survey areas: the footprint of the proposed dredge prism at the marina and the footprint of the proposed beneficial use site are located to the northeast. Surveys within these areas are necessary to document the potential effects of the proposed activities on eelgrass and macroalgal resources to help inform the design team and regional regulators. The following sections summarize the methods of the survey and the findings. Site photographs from the macrovegetation/eelgrass survey are provided in Appendix B, Site Photographs.

3.1. Eelgrass and Macrovegetation Survey Methods

The macrovegetation survey of this section of shoreline was conducted under the WDFW Eelgrass/Macroalgae Habitat Interim Survey Guidelines dated June 16, 2008 (WDFW 2008) and USACE4K Components of a Complete Eelgrass Delineation Report (USACE 2018). As per the protocols, the macrovegetation survey was initiated as a preliminary level survey (Tier 1 per USACE) using the geo-referenced hydroacoustic MX Aquatic Habitat Echosounder by BioSonics® aboard a vessel contracted with Gravity Marine. This system is comprised of a downward looking single beam transducer head that is georeferenced using a Trimble R2 Integrated GNSS Receiver System. A Sontek Castaway conductivity, temperature and depth (CTD) was used to profile density (i.e., salinity) of the water column to determine

the speed of sound for the survey site. In addition to the echosounder, an Outland technology 4K towed video system was used to ground truth/field verify echosounder data and to document fish and invertebrate resources associated with various habitat types encountered. An eelgrass biologist was onboard during the survey to document the extent of subtidal eelgrass (namely *Zostera marina*) and macroalgae in the proposed project area along with other observations about habitat quality and species diversity. Geospatial data was postprocessed for eelgrass and macroalgae coverage using ESRI software to compile a geospatial (geographic information system [GIS]) database.

Within both the marina and proposed beneficial use site, BioSonics® equipment was used to survey transects across the entire dredge and proposed beneficial use footprints. BioSonics® transects completed in these areas are shown on Figure 2, Survey Area Effort – Ilwaco Marina and Figure 3, Survey Area Effort – Ilwaco Proposed Beneficial Use Site, respectively. To confirm presence/absence of macrovegetation, field verification was performed using underwater video camera equipment within the proposed dredge prism and beneficial use area (Figures 2 and 3).

In addition to the vessel-based survey methods described above, a foot-based survey was completed to assess the habitat conditions within the upper elevations of the proposed beneficial use site as these areas were not accessible with the vessel due to shallow water/low tide conditions. In order to have complete survey coverage of the proposed beneficial use site, any areas not directly surveyed by the boat-based survey, or the foot-based survey were verified visually (either from the upland or from the water side) to be devoid of macrovegetation during low tide. Figure 3 illustrates the extent of the nearshore foot-based survey, and the vessel transects completed with the BioSonics® equipment.

3.2. Eelgrass and Macrovegetation Survey Results

The project site was surveyed on June 15, 2022. Conditions were calm with light and variable wind with overcast skies. Tides ranged from -2.06 feet mean lower low water (MLLW) to +6.8 feet MLLW during the survey. Water column visibility during field verification performed with underwater video was low during the survey with approximately 2 to 5 feet of visibility. A summary of survey findings is provided below.

3.2.1. Marina

The preliminary survey results identified one main bed of eelgrass within the marina with smaller adjacent patches. The mapped eelgrass is distributed in shallow subtidal areas between approximate elevations -7 to -10 feet (North American Vertical Datum of 1988 [NAVD 88] vertical datum). The survey identified the eelgrass distribution primarily within the center of the marina, adjacent to the “G Dock” with smaller patches scattered to the south and east (Figure 4, Eelgrass Coverage – Ilwaco Marina). This survey documented approximately 0.02 acres (983 square feet) of native eelgrass habitat within the marina (Figure 3).

Photographs of the macrovegetation portion of the site visit are provided in Appendix B, Figures B-5 and B-6.

3.2.2. Proposed Beneficial Use Area/Dredge Disposal Area

The preliminary survey results identified one patch of non-native eelgrass (*Zostera japonica*) and patchy rockweed (*Fucus distichus*) within the survey area associated with the proposed beneficial use site. No native eelgrass (*Zostera marina*) was identified in the proposed beneficial use site. The distribution of

these patches of submerged vegetation are shown on Figure 5, Macrovegetation Coverage – Ilwaco Proposed Beneficial Use Site and occurred between the approximate elevations +1 and +3 feet NAVD88. Our survey documented approximately 4.6 acres (200,080 square feet) of patchy non-native (*Z. japonica*) eelgrass and 2.9 acres (126,750 square feet) of patchy rockweed habitat within the proposed beneficial use site (Figure 5). Rockweed encountered was always associated with shallow low elevation rocky outcrops (e.g., Appendix B, Figure B-3; Photograph 6). No kelp species were noted in either survey area. Photographs of the macrovegetation portion of the site visit are provided in Appendix B, Figures B-3 and B-4.

3.2.3. Invertebrate and Vertebrate Fauna

As underwater video was limited to field verification of BioSonics® flagged macrovegetation and visibility was generally reduced within the Columbia River estuary, large mobile invertebrates and vertebrates were not documented. However, lack of video documentation does not suggest these species are not present at the site. Eelgrass and macroalgal habitat provide cover and foraging habitat for crab and fish species and likely numerous species occupy the documented habitat.

3.2.4. Anthropogenic Elements

Throughout the marina portion of the survey area, derelict boats, petroleum sheen on the water surface and other garbage on the water surface was noted. In contrast, the proposed beneficial use site was predominantly absent of anthropogenic materials such as concrete, and derelict fishing gear; however, some tires and wood debris were observed. The majority of the documented habitat in the vicinity of the proposed beneficial use site was unimpacted by human development or activities.

3.3. Summary

Native eelgrass was documented within the proposed dredge footprint at the Port of Ilwaco marina. The presence of eelgrass habitat within the marina likely occurs due to sediment deposition from the Columbia River raising elevations within the marina dredge basin so they are suitable for eelgrass as it has been an extended period of time since the last marina-wide dredging event. The Port has completed maintenance dredging in small, targeted areas where deposition and prop wash have created high spots over the last several years. A marina-wide maintenance dredging episode has not been completed for many years. The survey also documented non-native eelgrass and macroalgae habitat (rockweed) within the proposed beneficial use/dredge disposal area. The native eelgrass and rockweed habitats are considered protected as Essential Fish Habitat (EFH) for both marine and anadromous fish under the Magnuson Stevens Fishery Conservation and Management Act (PFMC 1998 and PFMC 1999). These saltwater habitats are also protected under WACs 220-110-250(3)(a,b) and per IMC Chapter 15.14 (Shoreline Master Program).

4.0 WETLANDS AND STREAMS FIELD INVESTIGATION

GeoEngineers' biologist conducted a field assessment on June 15, 2022, to characterize wetland and stream features within the project area. The survey area for wetlands and streams focused on the approximately 2,000 feet of shoreline located northeast of the marina, landward of and along the northwest edge of the proposed beneficial use site. One estuarine wetland (Wetland A) and no streams were identified during the field investigation. The wetland delineation focused on the waterward side of the wetland boundary. The landward boundary was delineated due to private property ownership. The

ordinary high water mark (OHWM) of the Columbia River was determined during the previous geodetic survey. Representative photographs of the site have been included in Appendix B.

4.1. Methods

The delineation of aquatic critical areas (wetlands and streams) was conducted in accordance with guidelines presented in IMC, Chapter 15.18 Critical Areas and the Shoreline Master Program (IMC Chapter 15.14). The wetland delineation was also conducted with the use of the *USACE Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (USACE 2010). The OHWM of potential streams was evaluated by examining breaks in the topography, drift lines, shifts in vegetation and signs of water marks, according to USACE protocol as referenced from Regulatory Guidance Letter (No. 05-05), Ordinary High-Water Mark Identification, December 7, 2005 (Riley 2005) and according to the Washington State Department of Ecology (Ecology) 2016 guidance (Anderson et al. 2016).

GeoEngineers collected geographic coordinates of the wetland boundaries and sample plots using a hand-held global positioning system (GPS) device. Survey flags were not placed because identified wetland habitat was below the shoreline OHWM, where flags could be washed away. A total of two sample plots were established within the project area as part of the wetland assessment. Sample plot data forms are presented in Appendix C, Sample Plot Data Forms. The delineated wetland was categorized using the 2014 Washington State Wetland Rating System for Western Washington (Hruby 2014). The rating system is intended for use primarily with vegetated, freshwater, wetlands as identified using the federal wetland delineation manual and the appropriate regional supplements. The rating system categorizes estuarine wetlands but does not rate their functions. The wetland rating form is included in Appendix D, Ecology Wetland Rating Form.

The wetland was categorized, and the regulatory wetland buffer was identified according to the Shoreline Master Program (IMC Chapter 15.14) based on the wetland habitat characteristics, Ecology wetland rating, and the intensity of proposed land use. For the purposes of this report, it is assumed that the site will have a high-intensity land use based on the project plans. The City of Ilwaco will make the final determination of buffer widths.

4.2. Results

Within the marina there was some limited upland vegetation growing on fill materials above the riprap bulkhead. Upland vegetation included clover species (*Trifolium species*), Japanese knotweed (*Polygonum cuspidatum*), various grasses, dandelion (*Taraxacum officinale*) and creeping buttercup (*Ranunculus repens*). No wetlands were noted in or around the marina.

Outside of the marina in the vicinity of the proposed beneficial use site, one estuarine wetland was identified below the eastern marina riprap bulkhead extending east adjacent to the proposed beneficial use site; dominant vegetation identified within the estuarine wetland during the site visit included Lyngbye's sedge (*Carex lyngbyei*), three-square (*Schoenplectus pungens*) and silverweed (*Potenitilla anserina*). In addition to the estuarine wetland, the Columbia River estuary was documented. No streams were identified along the shoreline of Baker Bay within and adjacent to the proposed beneficial use site.

The field assessment mapping results are presented in Figure 6, Wetland Survey Findings – Ilwaco Proposed Beneficial Use Site. Tables 1 and 2 on the following pages summarizes the wetland and Baker Bay features documented on the site and provides additional information regarding baseline conditions, rating details and regulatory requirements.

TABLE 1. WETLAND A SUMMARY

Shoreline Wetland – Information		
Location	Shoreline along proposed beneficial use site; northeast of existing marina	
WRIA	24 – Willapa	
Local Jurisdiction	Ilwaco	
Buffer Width[1]	200 feet	
Washington Ecology Categorization[2]	Category I	
Size	More than 2 acres	
Cowardin Class	Estuarine Emergent	
Description Summary		
Dominant Vegetation	**Herbaceous:** Lyngbye's sedge (*Carex lyngbyei*); three-square (*Schoenplectus pungens*); silverweed (*Potenitilla anserina*) **Shrub:** None **Tree:** None	
Soils	Meets criteria for hydric soil indicator sandy redox (S5) and hydrogen sulfide (A4).	
Hydrology	**Indicators:** Saturated, geomorphic position and facultative (FAC)-Neutral Test **Source:** Direct precipitation, runoff and tidal influences	
Wetland Functions Summary		
Water Quality	Moderate water quality functions because it is dominated by emergent vegetation. The wetland also has adjacent development with adjacent paved roads (i.e. sources of pollution). However, the wetland is directly adjacent to the marine influenced waters of the Columbia River with a direct outlet.	
Hydrologic	Moderate level for hydrologic functions due to vegetation coverage, and ability to slow water flow discharge and protect the shoreline from erosion.	
Habitat	Moderate to high level of habitat functions due to having direct connections to Columbia River, no vegetated connections to other upland or wetland areas, there is only one vegetation class (emergent) and special habitat features such as large woody debris.	
Buffer Condition	The wetland buffer is impacted and consists in part of paved roadways and single-family residences. There is direct observations and evidence of human uses within the buffer and portions of the buffer are dominated by invasives. In addition, boat use in the Columbia River disturbs the waterward side of the buffer.	

Notes:

1. According to IMC 15.18.030.G. Buffer width was identified according to the Ecology rating and a high intensity land use impact. The final buffer width is subject to approval by the jurisdictional authority.
2. Wetland category based on the Washington State Wetlands Rating System for Western Washington, (Hruby revised 2014). The wetland is greater than 1-acre in size, is relatively undisturbed and has tidal channels and depressions.

TABLE 2. BAKER BAY SUMMARY

Baker Bay – Information		
Location	Shoreline along proposed beneficial use site; east of marina	
WRIA	24 – Willapa	
Local Jurisdiction	Ilwaco	
DNR Stream Type[1]	S – Shoreline of the State	
Shoreline Type[2]	High Intensity A (adjacent to the marina) Shoreline Residential A (NE area of the investigation)	
Buffer Width[3]	Adjacent to High Intensity A: No buffer, and 50-foot structure setback. Adjacent to Shoreline Residential A: 100-foot buffer and 15-foot structure setback	
Average Channel Width[4]	5 to 6 miles wide in the lower reach (from the mouth to approximately 25 miles upstream)	
Gradient	Less than 5 percent	
Duration	Perennial and Tidally Influenced	
Description Summary		
Documented Fish Use[5]	Steelhead (*Oncorhynchus mykiss*), Bull Trout (*Salvelinus confluentus*), Coho Salmon (*Oncorhynchus kisutch*), Pink Salmon (*Oncorhynchus gorbuscha*), Chum Salmon (*Oncorhynchus keta*), Chinook Salmon (*Oncorhynchus tshawytscha*), Sockeye (*Oncorhynchus nerka*), Residential Coastal Cutthroat (*Oncorhynchus clarki*), White Sturgeon (*Acipenser transmontanus*), Green Sturgeon (*Acipenser medirostris*)	
Connectivity	Discharges to the Pacific Ocean	
Channel Description	5- to 6-mile-wide estuarine channel, 3.5 miles from the Pacific Ocean. Sand substrate.	
Buffer Condition	Riparian buffer within the project site consists of steeps slopes and native vegetation. Downstream from the project site the buffer contains rural residential development, landscape and native vegetation.	

Notes:

1. DNR FPAMT (DNR 2022).
2. City of Ilwaco Official Shorelines Map (IMC Chapter 15.14)
3. According to IMC Chapter 15.14, Appendix B, Table B3-1. The final buffer width is subject to approval by the jurisdictional authority.
4. Average Channel Width derived from estimates during the field investigation, aerial photographs and Light Detection and Ranging (LiDAR) data.
5. WDFW Priority Habitat and Species mapping application (WDFW 2022).

5.0 SUMMARY

GeoEngineers performed aquatic critical areas (wetlands and streams) assessment and a macrovegetation/eelgrass survey for the Port of Ilwaco Dredging and Dredge Material Placement Project. One estuarine wetland (Wetland A) was identified and delineated along the shoreline of the Columbia River. The wetland meets the characteristics to be a Category I estuarine system. According to Ilwaco Shoreline Master Program, the wetland will require a 200-foot buffer based on being an estuarine wetland with a high intensity of proposed adjacent land use. Native eelgrass (0.02 acres) was documented within the marina dredge prism. The eelgrass likely occurs within the marina due to an extended period of deposition from the Columbia River based on the lack of regular marina-wide dredging creating suitable growing conditions (depth) for the species to occur. Large, patchy areas of non-native eelgrass and brown algae were found in the upper elevations of the proposed beneficial use site.

6.0 LIMITATIONS

GeoEngineers has prepared this report in general accordance with the scope and limitations of our proposal. Within the limitations of scope, schedule and budget, our services have been executed in accordance with the generally accepted practices for wetland delineation and macro vegetation surveys in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

This report has been prepared for the exclusive use of Moffatt & Nichol, authorized agents and regulatory agencies following the described methods and information available at the time of the work. No other party may rely on the product of our services unless we agree in advance to such reliance in writing. The information contained herein should not be applied for any purpose or project except the one originally contemplated.

The applicant is advised to contact all appropriate regulatory agencies (local, state and federal) prior to design or construction of any development to obtain necessary permits and approvals.

7.0 REFERENCES

Anderson, Paul, S. Meyer, P. Olson and E. Stockdale. 2016. Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State. Washington State Department of Ecology Publication No. 16-06-029. Available at: https://fortress.wa.gov/ecy/publications/documents/1606029.pdf.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.

Hruby, T. 2014. Washington State Wetland Rating System for Western Washington: 2014 Update. (Publication #14-06-029). Olympia, WA: Washington Department of Ecology.

Ilwaco Municipal Code (IMC). Title 15 – Unified Development Ordinance, Chapter 15.18 Critical Areas.

Ilwaco Municipal Code (IMC). Title 15 – Unified Development Ordinance, Chapter 15.14 Shoreline Master Program.

Pacific Fisheries Management Council (PFMC). 1998. *The Coastal Pelagic Fishery Management Plan: Amendment 8*. Pacific Fishery Management Council.

Pacific Fisheries Management Council (PFMC). 1999. *Amendment 14 to the Pacific Coast Salmon Plan. Appendix A: Description and Identification of Essential Fish Habitat, Adverse Impacts, and Recommended Conservation Measures for Salmon*. Pacific Fisheries Management Council.

Riley, Don T. 2005. Ordinary High Water Mark Identification. United States Army Corps of Engineers (USACE), Regulatory Guidance Letter, No. 05-05).

United States Army Corps of Engineers (USACE), 2010, Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region, ed. J.S. Wakeley, R. W. Lichvar, and C.V. Noble. ERDC/EL TR-10-3. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

United States Army Corps of Engineers (USACE). 2015. Baker Bay – Chinook, Eelgrass Survey. Data collected in 2015. Deborah Shafer ERDC and Portland COE.

United States Army Corps of Engineers (USACE). 2018. Components of a Complete Eelgrass Delineation Report. Developed by Dr. Deborah Shafer Nelson.

United States Department of Agriculture – National Resource Conservation Service (USDA-NRCS). 2022. Web Soil Survey. http://websoilsurvey.nrcs.usda.gov/app/.

United States Fish and Wildlife Service (USFWS). 2022. Wetlands Mapper. http://www.fws.gov/wetlands/Data/mapper.html.

Washington Department of Fish and Wildlife (WDFW) 2008. Eelgrass/Macroalgae Habitat Interim Survey Guidelines. Available at: https://wdfw.wa.gov/sites/default/files/publications/00714/wdfw00714.pdf

Washington Department of Fish and Wildlife (WDFW). 2022. Priority Habitats and Species (PHS) on the Web. Available at: http://wdfw.wa.gov/mapping/phs/.

Washington State Department of Natural Resources (DNR). 2022. Forest Practices Application Mapping Tool (FPAMT). Available at: https://fpamt.dnr.wa.gov/default.aspx

FIGURES

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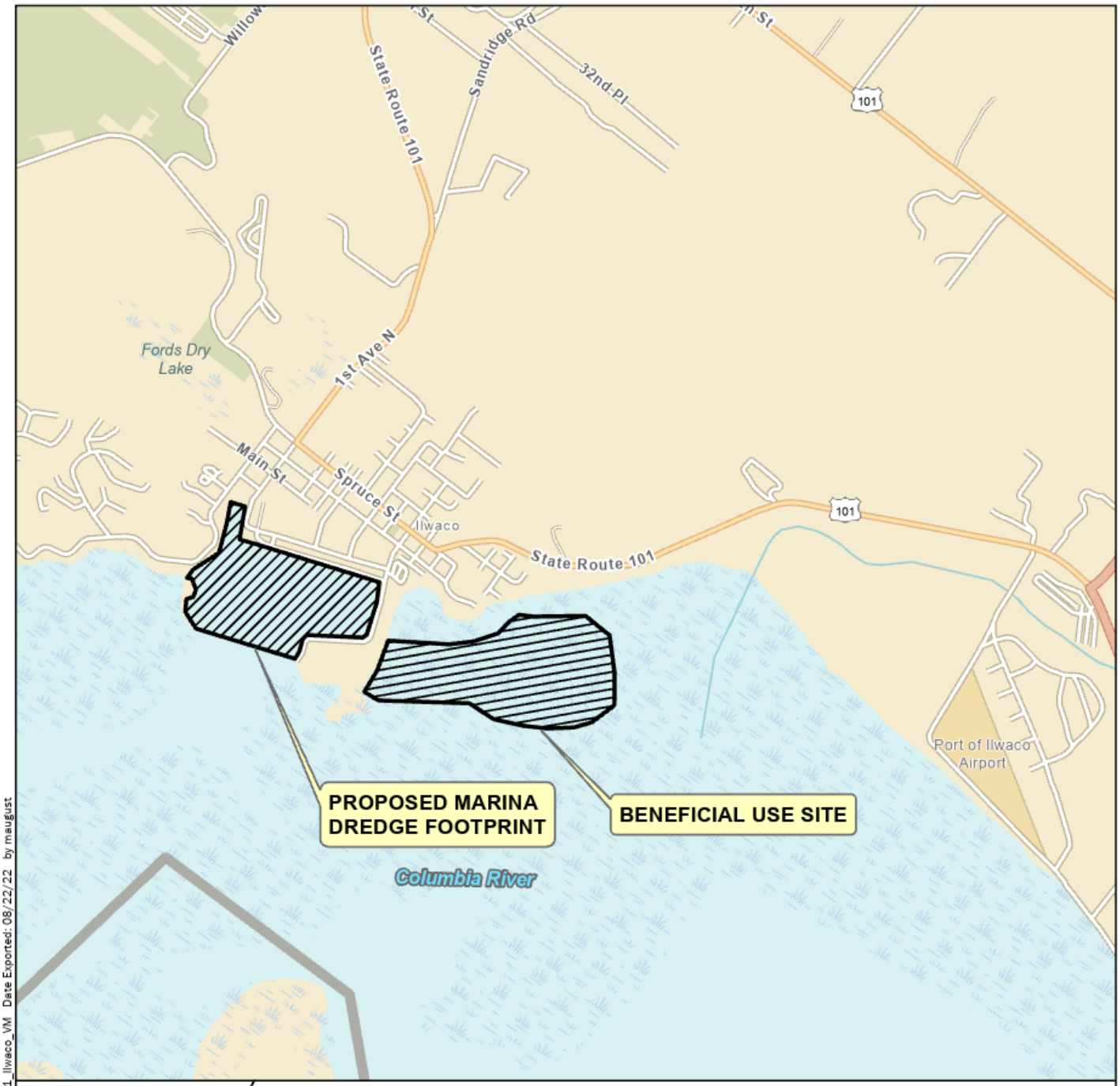

2,000 0 2,000

Feet

Vicinity Map

Port of Ilwaco Dredging and
Dredge Material Placement Project
Ilwaco, Washington

GeoEngineers

Figure 1

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: ESRI

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

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Legend

BioSonics Transect

Field Verification Area (Underwater camera)

Data Source: Data Source: Bing Aerial Imagery

N W E S

200 0 200

Feet

Survey Area Effort – Ilwaco Marina

Port of Ilwaco Dredging and
Dredge Material Placement Project
Ilwaco, Washington

GeoEngineers

Figure 2

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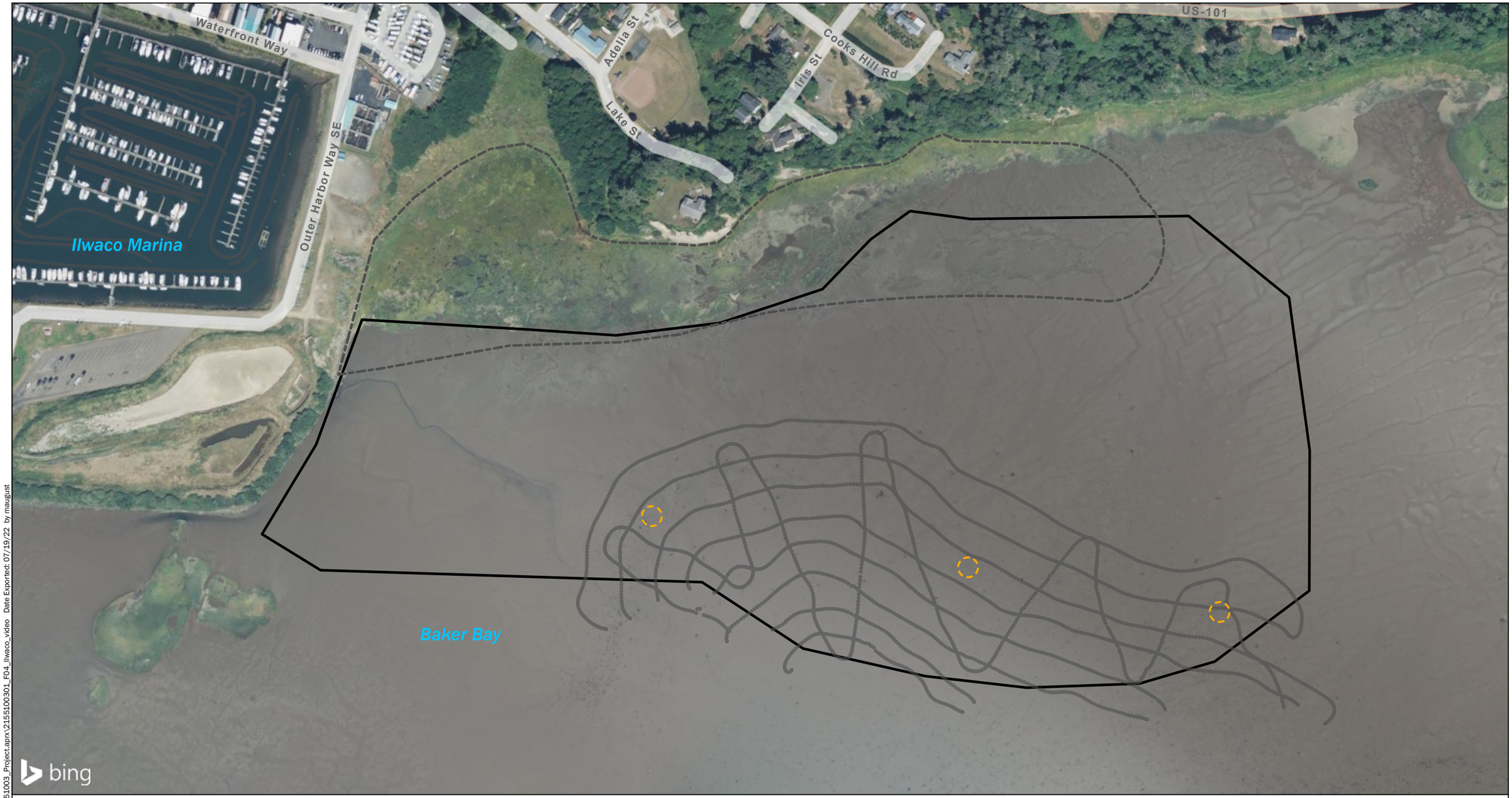

Legend

- BioSonics Transect
- Field Verification Area (underwater camera)
- Wetland and Stream Assessment Area and Nearshore Macrovegetation/Eelgrass Survey Area
- Ilwaco Beneficial Use Site

Data Source: Bing Aerial Imagery

300 0 300

Feet

Survey Area Effort –Ilwaco Proposed Beneficial Use Site

Port of Ilwaco Dredging and Dredge Material Placement Project
Ilwaco, Washington

GeoEngineers

Figure 3

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Native Eelgrass Presence

Data Source: Bing Aerial Imagery.

N

200 0 200

Feet

Eelgrass Coverage – Ilwaco Marina

Port of Ilwaco Dredging and
Dredge Material Placement Project
Ilwaco, Washington

GeoEngineers

Figure 4

Notes:
1. The locations of all features shown are approximate.
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Data Source: Bing Aerial Imagery

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

Legend

- Ilwaco Beneficial Use Site
- Non-Native Eelgrass
- *Fucus distichus*

300 0 300
Feet

Macrovegetation Coverage – Ilwaco
Proposed Beneficial Use Site

Port of Ilwaco Dredging and
Dredge Material Placement Project
Ilwaco, Washington

GeoEngineers

Figure 5

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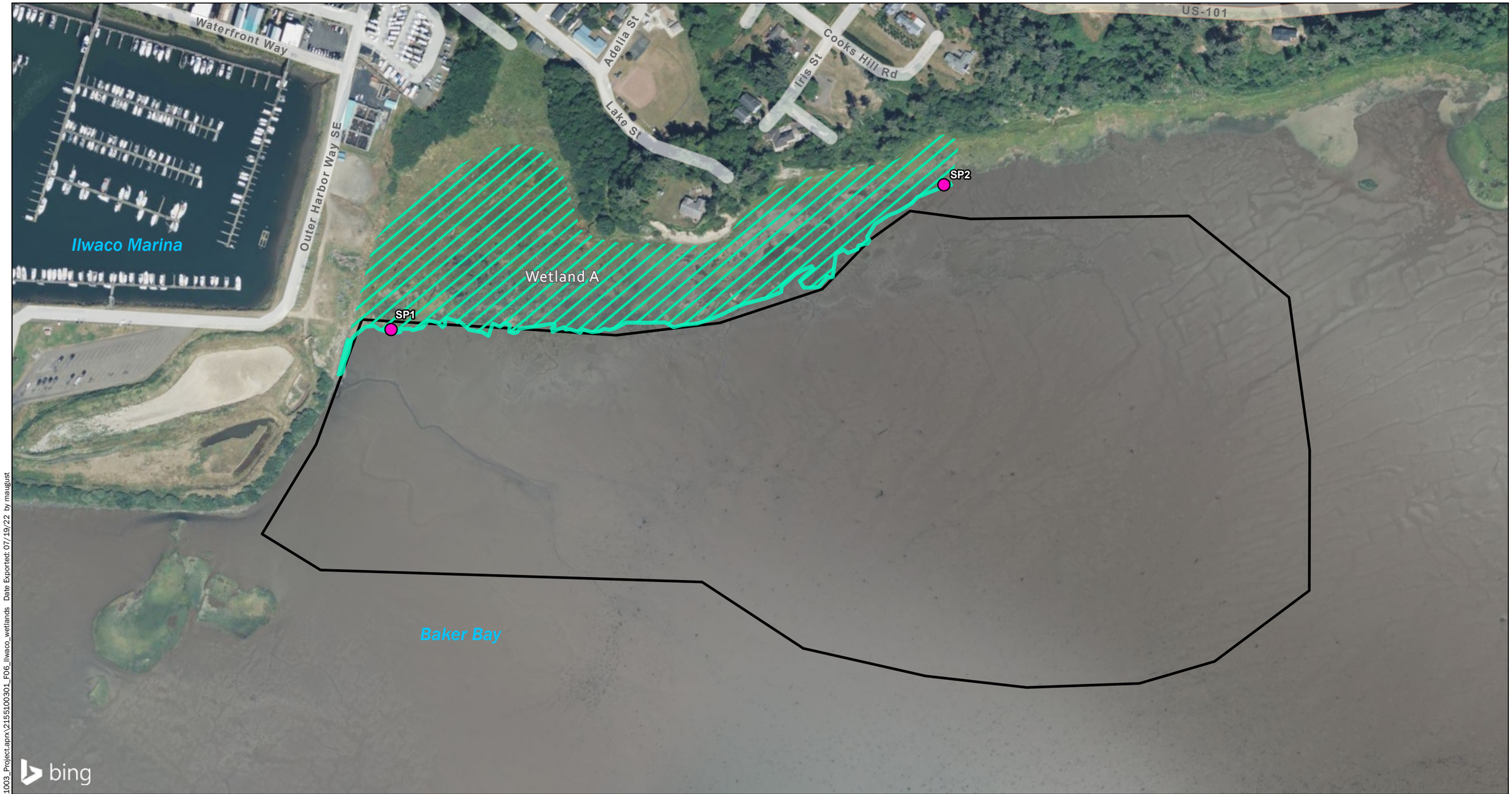

Legend

- Sample Point
- Delineated Wetland Boundary
- Wetland
- Ilwaco Beneficial Use Site

Data Source:

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Feet

Wetland Survey Findings - Ilwaco Proposed Beneficial Use Site

Port of Ilwaco Dredging and Dredge Material Placement Project
Ilwaco, Washington

GeoEngineers

Figure 6

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APPENDICES

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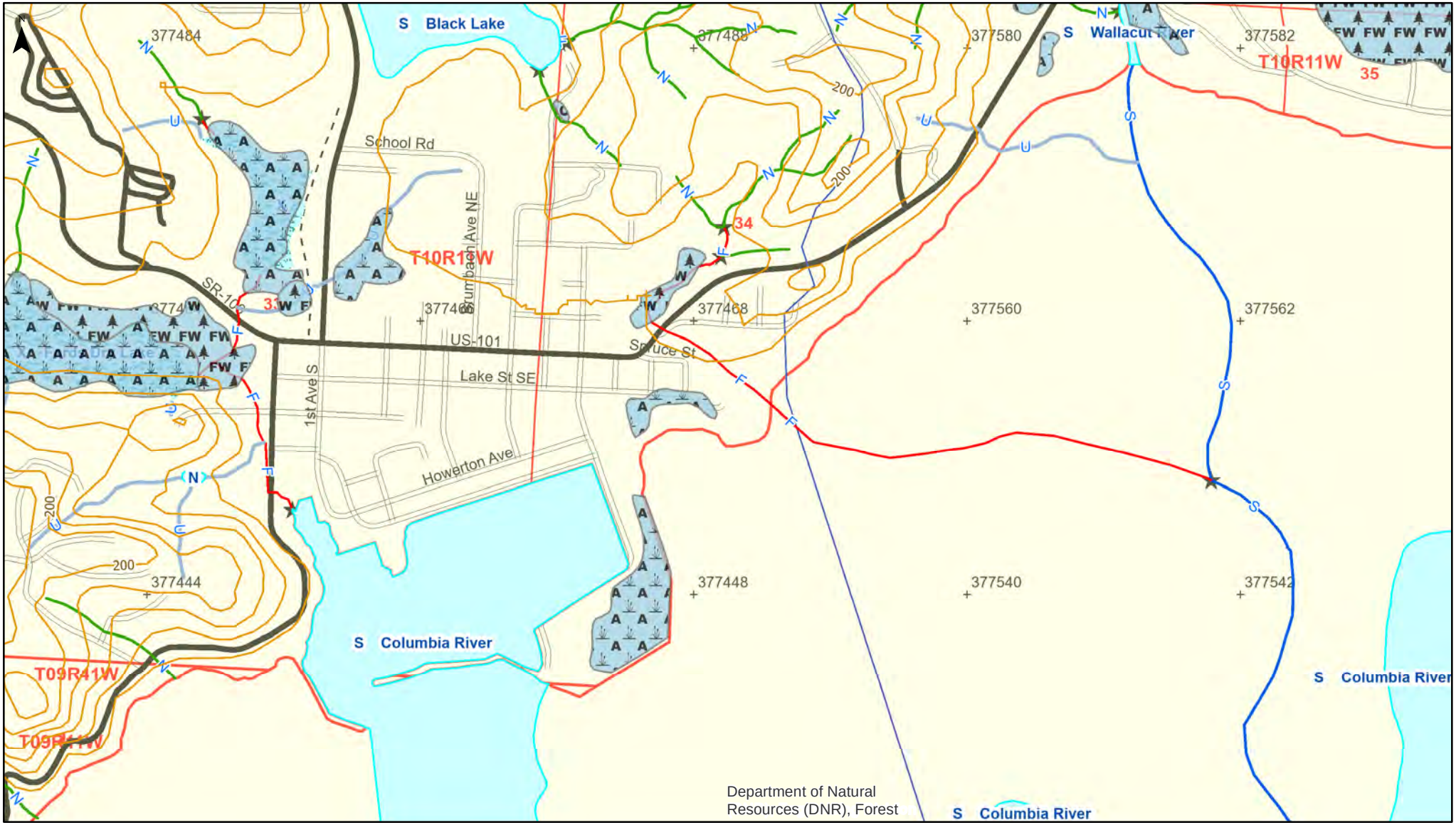
APPENDIX A
Published Data Review

Forest Practices Water Type Map



Map Symbols

- New Stream
- Proposed Water Type
- Stream Removal
- Break between water types
- Start and End Point of Surveyed Reach
- Natural Fish Barrier
- Manmade Barrier
- End of Fish or Last Fish

Additional Information

Legal Description

S35 T10.0N R11.0W, S33 T10.0N R11.0W
S03 T09.0N R11.0W, S04 T09.0N R11.0W
S34 T10.0N R11.0W

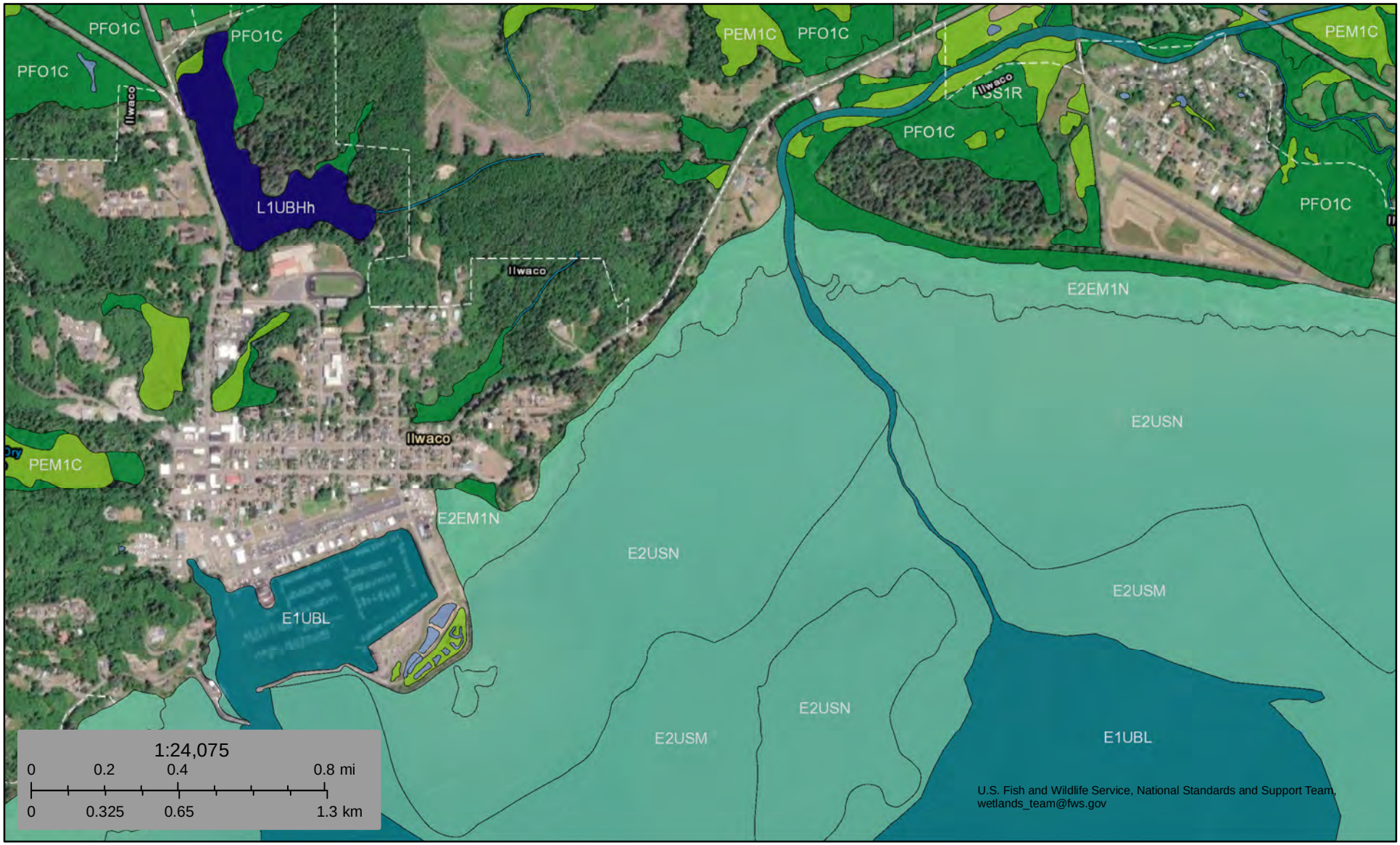
WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES

0 0.25 Miles

Date: 8/18/2022 Time: 6:21:47 PM

U.S. Fish and Wildlife Service
National Wetlands Inventory

Wetlands



June 29, 2022

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

Map Scale: 1:7,640 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 100 200 400 600

Feet
0 350 700 1400 2100

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Grays Harbor County Area, Pacific and Wahkiakum Counties, Washington
Survey Area Data: Version 20, Aug 23, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

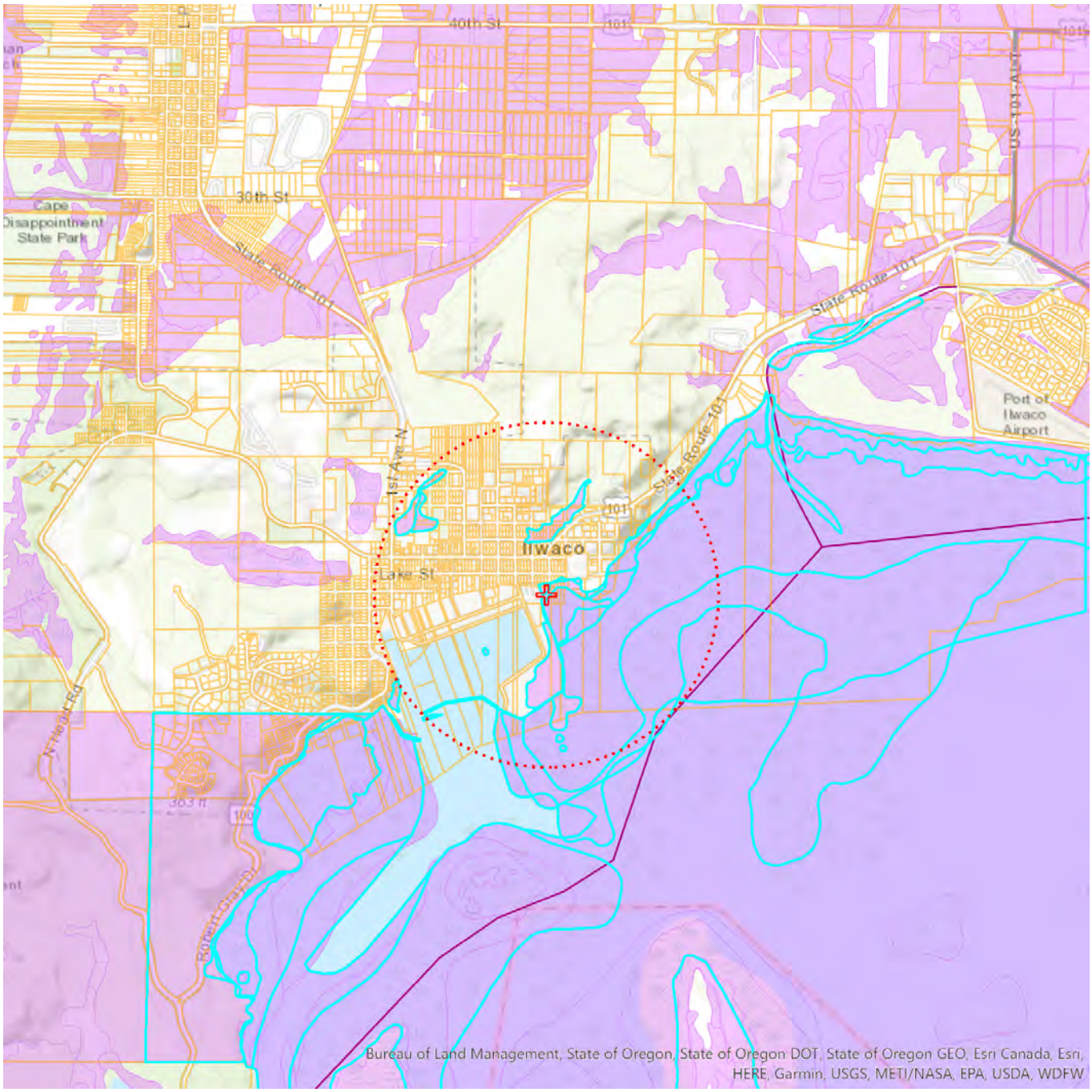
Date(s) aerial images were photographed: Jul 26, 2020—Jul 27, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
115	Palix silt loam, cool, 30 to 65 percent slopes	8.5	7.9%
147	Udorthents, level	15.9	14.7%
158	Willapa silt loam, cool, 1 to 8 percent slopes	9.6	8.9%
169	Water	74.0	68.5%
Totals for Area of Interest		**108.0**	**100.0%**

Priority Habitats and Species on the Web



Buffer radius: 0.5 Miles

Report Date: 06/29/2022

PHS Species/Habitats Overview:

Occurence Name	Federal Status	State Status	Sensitive Location
Marbled murrelet	Threatened	Endangered	No
Shorebird Concentrations	N/A	N/A	No
Waterfowl Concentrations	N/A	N/A	No
Wetlands	N/A	N/A	No
Purple martin	N/A	N/A	No
Estuarine and Marine Wetland	N/A	N/A	No
Freshwater Emergent Wetland	N/A	N/A	No
Freshwater Forested/Shrub Wetland	N/A	N/A	No

PHS Species/Habitats Details:

Marbled murrelet	
Scientific Name	*Brachyramphus marmoratus*
Priority Area	Breeding Survey
Site Name	T9-0N R11-0W S04
Accuracy	NA
Notes	Detection Status: 3
Source Dataset	WS_MMDetSect
Source Name	Not Given
Source Entity	WDFW Wildlife Program
Federal Status	Threatened
State Status	Endangered
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	Y
Display Resolution	AS MAPPED
ManagementRecommendations	http://wdfw.wa.gov/publications/pub.php?id=00026
Geometry Type	Polygons

Shorebird Concentrations	
Priority Area	Regular Concentration
Site Name	BAKER BAY
Notes	SHOREBIRD CONCENTRATION AREAS
Source Record	904452
Source Dataset	PHSREGION
Source Name	SKRILETZ, JEFF
Source Entity	WA Dept. of Fish and Wildlife
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS LISTED OCCURRENCE
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://wdfw.wa.gov/publications/pub.php?id=00026
Geometry Type	Polygons

Waterfowl Concentrations	
Priority Area	Regular Concentration
Site Name	BAKER BAY
Accuracy	1/4 mile (Quarter Section)
Notes	WATERFOWL WINTERING CONCENTRATION AREA.
Source Record	902356
Source Dataset	PHSREGION
Source Name	SCHIRATO, GREG
Source Entity	WA Dept. of Fish and Wildlife
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS LISTED OCCURRENCE
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://wdfw.wa.gov/publications/pub.php?id=00026
Geometry Type	Polygons

Wetlands	
Priority Area	Aquatic Habitat
Site Name	REGION 6 SALTWATER WETLANDS
Accuracy	1/4 mile (Quarter Section)
Notes	COASTAL SALT MARSHES SALT MEADOWS AND BRACKISH MARSHES
Source Record	904451
Source Dataset	PHSREGION
Source Name	GUFLER DAVE
Source Entity	WA Dept. of Fish and Wildlife
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

Purple martin	
Scientific Name	*Progne subis*
Priority Area	Breeding Area
Site Name	ILWACO MARINA
Accuracy	GPS
Notes	NESTIN IN TOP OF ROTTEN PILINGS AT MARINA.
Source Record	4592
Source Dataset	WS_OccurPolygon
Source Date	WS_OccurPolygon
Source Name	SCHMIDT, T/WDFW
Source Entity	WA Dept. of Fish and Wildlife
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS LISTED OCCURRENCE
Sensitive	N
SGCN	Y
Display Resolution	AS MAPPED
ManagementRecommendations	http://wdfw.wa.gov/publications/pub.php?id=00026
Geometry Type	Polygons

Estuarine and Marine Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Estuarine and Marine Wetland - NWI Code: E2EM1N
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

Estuarine and Marine Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Estuarine and Marine Wetland - NWI Code: E2EM1N
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

Estuarine and Marine Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Estuarine and Marine Wetland - NWI Code: E2EM1N
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

Estuarine and Marine Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Estuarine and Marine Wetland - NWI Code: E2RSPr
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

Estuarine and Marine Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Estuarine and Marine Wetland - NWI Code: E2USM
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

Freshwater Emergent Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Freshwater Emergent Wetland - NWI Code: PEM1As
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

Freshwater Emergent Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Freshwater Emergent Wetland - NWI Code: PEM1C
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

Freshwater Forested/Shrub Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Freshwater Forested/Shrub Wetland - NWI Code: PFO1C
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

Freshwater Forested/Shrub Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Freshwater Forested/Shrub Wetland - NWI Code: PSS1Ch
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

Estuarine and Marine Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Estuarine and Marine Wetland - NWI Code: E2USN
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

Estuarine and Marine Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Estuarine and Marine Wetland - NWI Code: E2EM1N
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

Estuarine and Marine Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Estuarine and Marine Wetland - NWI Code: E2EM1N
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

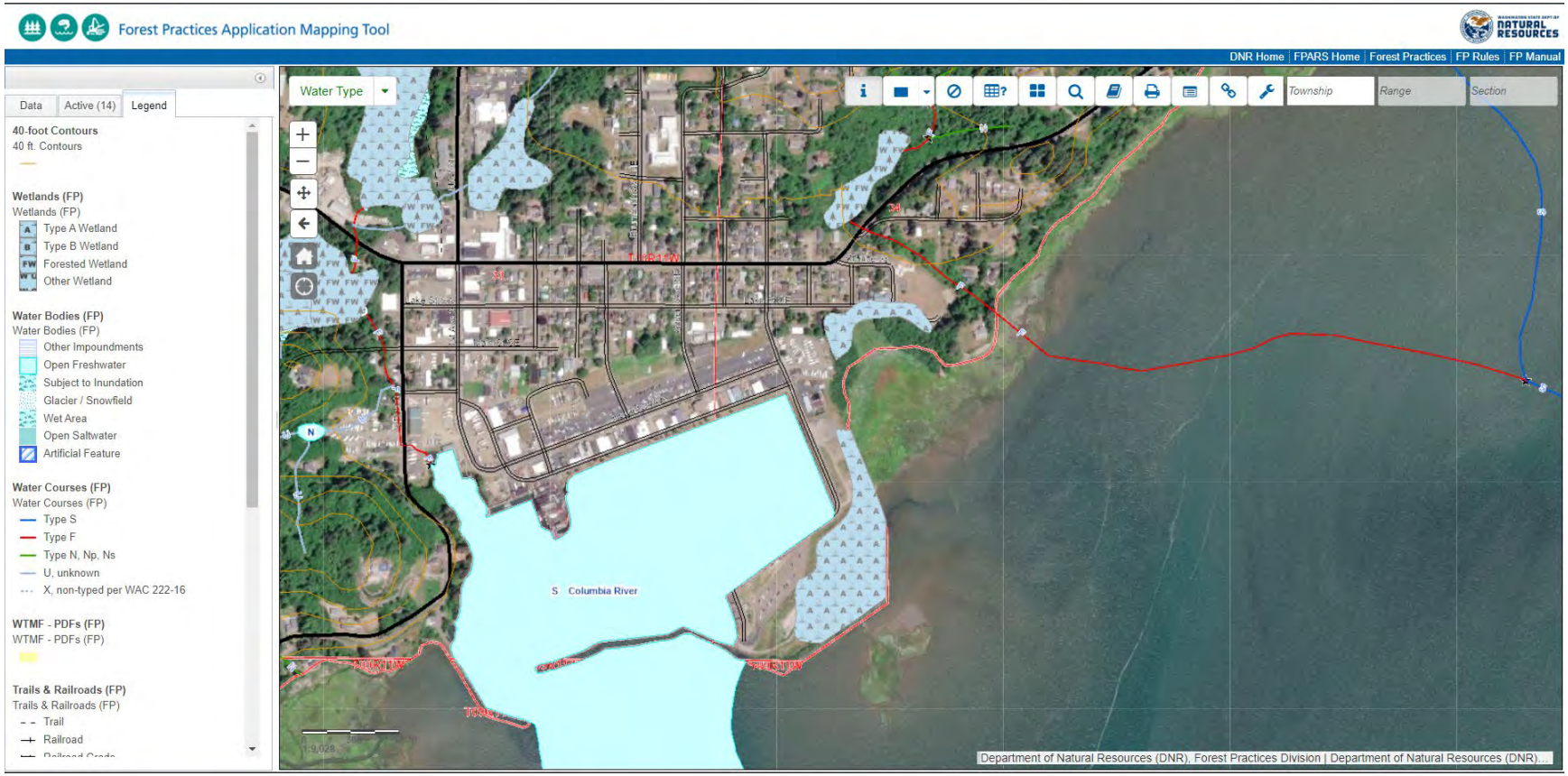
Freshwater Forested/Shrub Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Freshwater Forested/Shrub Wetland - NWI Code: PSS1S
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

Freshwater Forested/Shrub Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Freshwater Forested/Shrub Wetland - NWI Code: PSSR
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

Freshwater Forested/Shrub Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Freshwater Forested/Shrub Wetland - NWI Code: PSSR
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

Estuarine and Marine Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Estuarine and Marine Wetland - NWI Code: E2USN
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

Washington Department of Natural Resources Forest Practicies Application Mapping Tool (FPARS).



APPENDIX B
Site Photographs

Photograph 1. Looking north just east of the marina. A riprap bulkhead protects the access road to the boat launch at the marina. (June 15, 2022)

Photograph 2. Looking north over the estuarine wetland (Wetland A). (June 15, 2022)

Site Photographs – Wetland Survey

Port of Ilwaco Dredging and Dredge Material Placement Project
Ilwaco, Washington

GeoEngineers

Figure B-1

21551-003-01 Date Exported: July 5, 2022

Photograph 3. Tidal channels and areas of open water were identified in the wetland. (June 15, 2022)

Photograph 4. Estuarine Wetland A near the eastern portion of the investigation area. (June 15, 2022)

Site Photographs – Wetland Survey

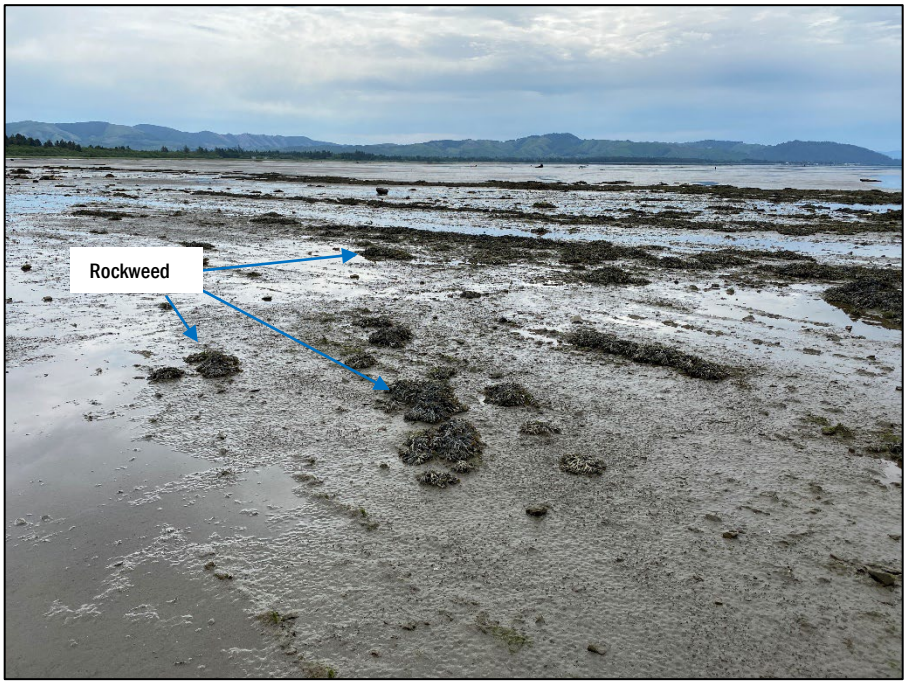
Port of Ilwaco Dredging and Dredge Material Placement Project
Ilwaco, Washington

GeoEngineers

Figure B-2

0422-148-01 Date Exported: June 22, 2020

Photograph 5. Columbia River adjacent to the estuarine wetland and investigation area. (June 15, 2022)



Photograph 6. Rockweed patchy area near the western side of the investigation area within the Columbia River. (June 15, 2022)

Site Photographs – Macrovegetation Survey

Port of Ilwaco Dredging and Dredge Material Placement Project
Ilwaco, Washington

GeoEngineers

Figure B-3

0422-148-01 Date Exported: June 22, 2020

Photograph 7. Non-native eelgrass (*Zostera japonica*) on the east side of the investigation area. (June 15, 2022)

Photograph 8. Non-native eelgrass on the east side of the investigation area. (June 15, 2022)

Site Photographs – Macrovegetation Survey

Port of Ilwaco Dredging and Dredge Material Placement Project
Ilwaco, Washington

GeoEngineers

Figure B-4

0422-148-01 Date Exported: June 22, 2020

Photograph 9. Ilwaco marina surface conditions. Breakwater shown in the background. (June 15, 2022)

Photograph 10. Vessel for completing the macrovegetation surveys shown with towed underwater camera on deck of vessel. (June 15, 2022)

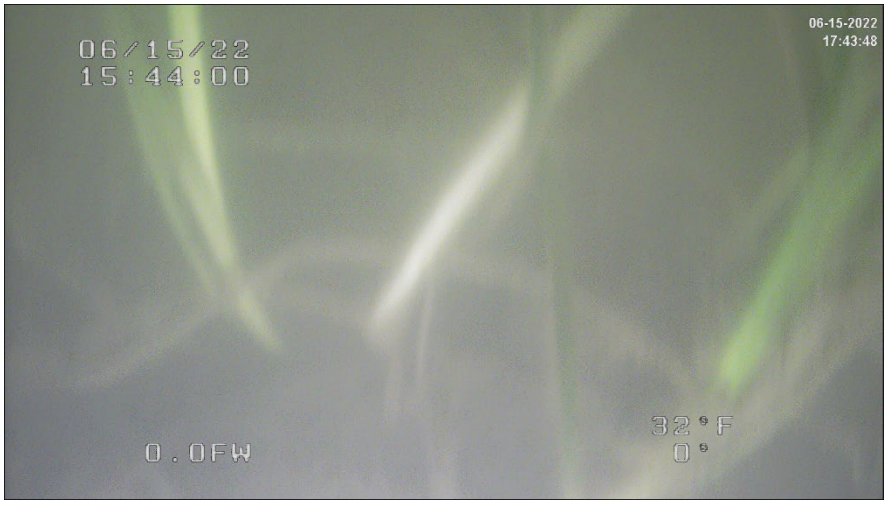
Site Photographs – Macrovegetation Survey

Port of Ilwaco Dredging and Dredge Material Placement Project
Ilwaco, Washington

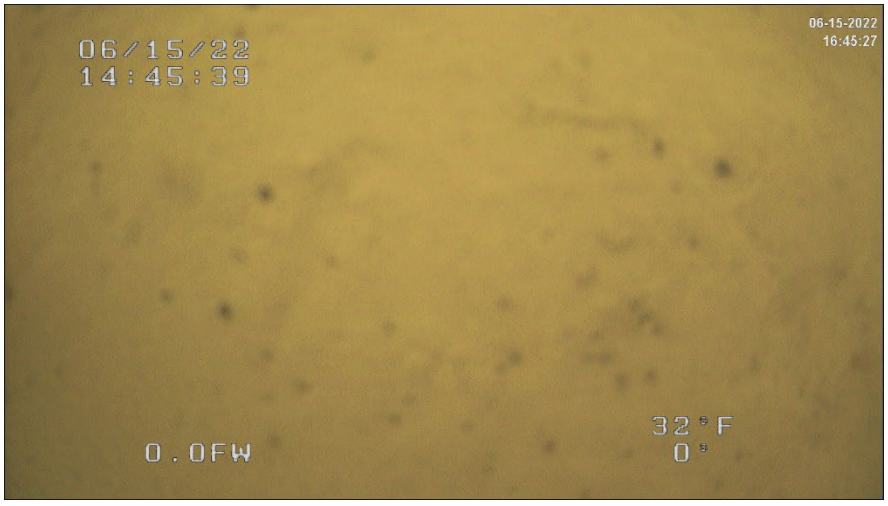
GeoEngineers

Figure B-5

0422-148-01 Date Exported: June 22, 2020



Photograph 11. Native eelgrass (*Zostera marina*) field verified during the survey within the Ilwaco marina. (June 15, 2022)



Photograph 12. Soft, mud bottom substrate conditions within the footprint of the proposed beneficial use area for the dredge material. No eelgrass was observed in this area. Siphon holes from clams visible in photo. (June 15, 2022)

Site Photographs – Macrovegetation Survey	
Port of Ilwaco Dredging and Dredge Material Placement Project Ilwaco, Washington	
GeoEngineers	Figure B-6

0422-148-01 Date Exported: June 22, 2020

APPENDIX C
Sample Plot Data Forms

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Port of Ilwaco Wharf Bulkhead and Gangeway Access City/County: Ilwaco Sampling Date: 6.15.22

Applicant/Owner: Port of Ilwaco State: WA Sampling Point: SP-1

Investigator(s): J. Dadisman Section, Township, Range: Section 34, Township 10 North, Range 11 West

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): Concave Slope (%): <5

Subregion (LRR): A Lat: Long: Datum:

Soil Map Unit Name: Water NWI Classification: EEM

Are climatic / hydrologic conditions on the site typical for this time of year? (●) Yes ( ) No (If no, explain in Remarks.)

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? (●) Yes ( ) No

Are Vegetation [ ], Soil [ ], or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	(●) Yes	( ) No	**Is the Sampled Area within a Wetland?**	(●) Yes ( ) No
Hydric Soil Present?	(●) Yes	( ) No		
Wetland Hydrology Present?	(●) Yes	( ) No		

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft x 30ft)	Absolute % Cover	Dom. Sp.?	Relative % Cover	Indicator Status
1.				
2.				
3.				
4.				
	= Total Cover			
Sapling/Shrub Stratum (Plot size: 5ft x 5ft)				
1.				
2.				
3.				
4.				
5.				
	= Total Cover			
Herb Stratum (Plot size: 5ft x 5ft)				
1. *Carex lyngbyei*	50	**Y**	45.5	OBL
2. *Schoenoplectus pungens*	40	**Y**	36.4	OBL
3. *Potentilla anserina*	20	N	18.2	OBL
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
	110 = Total Cover			
Woody Vine Stratum (Plot size: 30ft x 30ft)				
1.				
2.				
	= Total Cover			

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	110	x 1 =	110
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	110 (A)		110 (B)

Prevalence Index = B/A = 1.000

Hydrophytic Vegetation Indicators:

- [✓] 1 - Rapid Test for Hydrophytic Vegetation
- [✓] 2 - Dominance Test is >50%
- [✓] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] 5 - Wetland Non-Vascular Plants[1]
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? (●) Yes ( ) No

Remarks:

SOIL

Sampling Point: SP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-13	2.5Y	4/1	95	5YR	4/4	5	C	M	Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☑ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? ◉ Yes ○ No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☑ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? ○ Yes ◉ No Depth (inches):

Water Table Present? ◉ Yes ○ No Depth (inches): 11

Saturation Present? (includes capillary fringe) ◉ Yes ○ No Depth (inches): 0

Wetland Hydrology Present? ◉ Yes ○ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Port of Ilwaco Wharf Bulkhead and Gangeway Access City/County: Ilwaco Sampling Date: 6.15.22

Applicant/Owner: Port of Ilwaco State: WA Sampling Point: SP-2

Investigator(s): J. Dadisman Section, Township, Range: Section 34, Township 10 North, Range 11 West

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): Concave Slope (%): <5

Subregion (LRR): A Lat: Long: Datum:

Soil Map Unit Name: Water NWI Classification: EEM

Are climatic / hydrologic conditions on the site typical for this time of year? (●) Yes ( ) No (If no, explain in Remarks.)

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? (●) Yes ( ) No

Are Vegetation [ ], Soil [ ], or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	(●) Yes	( ) No	**Is the Sampled Area within a Wetland?**	(●) Yes ( ) No
Hydric Soil Present?	(●) Yes	( ) No		
Wetland Hydrology Present?	(●) Yes	( ) No		

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft x 30ft)	Absolute % Cover	Dom. Sp.?	Relative % Cover	Indicator Status
1.				
2.				
3.				
4.				
	= Total Cover			
Sapling/Shrub Stratum (Plot size: 5ft x 5ft)				
1.				
2.				
3.				
4.				
5.				
	= Total Cover			
Herb Stratum (Plot size: 5ft x 5ft)				
1. *Carex lyngbyei*	100	Y	100.0	OBL
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
	100 = Total Cover			
Woody Vine Stratum (Plot size: 30ft x 30ft)				
1.				
2.				
	= Total Cover			

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	100	x 1 =	100
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		100 (B)

Prevalence Index = B/A = 1.000

Hydrophytic Vegetation Indicators:

- [✓] 1 - Rapid Test for Hydrophytic Vegetation
- [✓] 2 - Dominance Test is >50%
- [✓] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] 5 - Wetland Non-Vascular Plants[1]
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? (●) Yes ( ) No

Remarks:

SOIL

Sampling Point: SP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	5Y 3/1	100					Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☑ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Rock

Depth (inches): 10

Hydric Soil Present? ◉ Yes ○ No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☑ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? ○ Yes ◉ No Depth (inches):

Water Table Present? ◉ Yes ○ No Depth (inches): 0

Saturation Present? (includes capillary fringe) ◉ Yes ○ No Depth (inches): 0

Wetland Hydrology Present? ◉ Yes ○ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX D
Ecology Wetland Rating Form

Wetland name or number _____

RATING SUMMARY – Western Washington

Name of wetland (or ID #): _____ Date of site visit: _____

Rated by _____ Trained by Ecology? ___Yes ___No Date of training _____

HGM Class used for rating _____ Wetland has multiple HGM classes? ___Y ____N

NOTE: **Form is not complete without the figures requested** *(figures can be combined)*.

Source of base aerial photo/map _____

OVERALL WETLAND CATEGORY _____ (based on functions___ or special characteristics_____

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 23 - 27

_____**Category II** – Total score = 20 - 22

_____**Category III** – Total score = 16 - 19

_____**Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality			Hydrologic			Habitat			
	Circle the appropriate ratings									
Site Potential	H	M	L	H	M	L	H	M	L	
Landscape Potential	H	M	L	H	M	L	H	M	L	
Value	H	M	L	H	M	L	H	M	L	**TOTAL**
Score Based on Ratings										

Score for each function based on three ratings *(order of ratings is not important)*

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	I II
Wetland of High Conservation Value	I
Bog	I
Mature Forest	I
Old Growth Forest	I
Coastal Lagoon	I II
Interdunal	I II III IV
None of the above	

Wetland name or number 

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number 

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

   NO – go to 2 **YES** – the wetland class is **Tidal Fringe** – go to 1.1

   1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

   NO – Saltwater Tidal Fringe (Estuarine) **YES – Freshwater Tidal Fringe**
   *If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

   NO – go to 3 **YES** – The wetland class is **Flats**
   *If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.*

3. Does the entire wetland unit **meet all** of the following criteria?
   ___The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size;
   ___At least 30% of the open water area is deeper than 6.6 ft (2 m).

   NO – go to 4 **YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
   ___The wetland is on a slope (*slope can be very gradual*),
   ___The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks,
   ___The water leaves the wetland **without being impounded**.

   NO – go to 5 **YES –** The wetland class is **Slope**

   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

5. Does the entire wetland unit **meet all** of the following criteria?
   ___The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
   ___The overbank flooding occurs at least once every 2 years.

Wetland name or number 

NO – go to 6 **YES** – The wetland class is **Riverine**

NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland.*

   NO – go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

   NO – go to 8 **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

   NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

*If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.*

Wetland name or number [redacted]

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? – [redacted] gime is tidal, – [redacted] Vegetated, and – [redacted] han 0.5 ppt Yes –Go to **SC 1.1** No= **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = **Category I** No - Go to **SC 1.2**	**Cat. I**
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? – [redacted] y undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less [redacted] 10% cover [redacted] native plant species. (If non-native species are *Spartina*, see page 25) – [redacted] t least ¾ of the lan [redacted] ard edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-[redacted] nowed grassland. – [redacted] wetland has [redacted] t two of the following features: tidal channels, depressions with open water, or [redacted] wetlands. Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes – Go to **SC 2.2** No – Go to **SC 2.3** SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes = **Category I** No = **Not a WHCV** SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes **– Contact WNHP/WDNR and go to SC 2.4** No = **Not a WHCV** SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? Yes = **Category I** No = **Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? Yes – Go to **SC 3.3** No – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 3.3** No = **Is not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = **Is a Category I bog** No – Go to **SC 3.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = **Is a Category I bog** No **= Is not a bog**	**Cat. I**

Wetland name or number _[redacted]

SC 4.0. Forested Wetlands Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? ***If you answer YES you will still need to rate the wetland based on its functions.*** — **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more. — **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm). Yes = **Category I** No = **Not a forested wetland for this section**	**Cat. I**
SC 5.0. Wetlands in Coastal Lagoons Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* Yes – Go to **SC 5.1** No = **Not a wetland in a coastal lagoon**	**Cat. I**
SC 5.1. Does the wetland meet all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2) Yes = **Category I** No = **Category II**	**Cat. II**
SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer yes you will still need to rate the wetland based on its habitat functions.*** In practical terms that means the following geographic areas: — Long Beach Peninsula: Lands west of SR 103 — Grayland-Westport: Lands west of SR 105 — Ocean Shores-Copalis: Lands west of SR 115 and SR 109 Yes – Go to **SC 6.1** No = **not an interdunal wetland for rating**	**Cat I**
SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = **Category I** No – Go to **SC 6.2**	**Cat. II**
SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? Yes = **Category II** No – Go to **SC 6.3**	**Cat. III**
SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = **Category III** No = **Category IV**	**Cat. IV**
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	

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GeoEngineers