Appendix F
Wetland Delineation Report, Tillamook PUD Project, Tillamook, Oregon

Report

Wetland Delineation Report
Tillamook PUD Project
Tillamook, Oregon

Prepared for

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Introduction

This document presents the results of a delineation of wetlands and other waters that CH2M HILL completed on behalf of the Tillamook People's Utility District (PUD) for a proposed transmission line project in Tillamook County, Oregon (Figure 1 in Appendix A).

The project area is located within both Tillamook County and the City of Tillamook on the northern Oregon coast. The project consists of a proposed 7.0-mile-long, 115-kilovolt (kV), overhead transmission line from an existing substation near the City of Tillamook heading west toward a proposed new substation near the Netarts/Oceanside area.

The project's study area for this report is an approximately 300-foot-wide corridor along the preferred transmission line route, as well as two short alternative routes (Figure 2 in Appendix A).

Delineation work was conducted to identify the locations of wetlands and other waters, and to determine whether U.S. Army Corps of Engineers (USACE) or Oregon Department of State Lands (DSL) permits for wetlands/waters disturbance are required for project implementation. The field investigation was conducted April 4–8, 2011 and August 15, 2012.

Report Organization

Subsequent sections of this report are organized as follows:

- A—Description of Site, Landscape Setting, and Previous and Current Land Uses
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Appendixes are as follows:

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A) Description of Site, Landscape Setting, and Previous and Current Land Uses
OAR141-090-0035 (7)(a)

The proposed project is located in Tillamook County and the City of Tillamook, Oregon. The project's study area is located in Township (T) 1S, Range (R) 9W, Section (S) 30 and Township (T) 1S, Range (R) 10W, Sections (S) 25, 26, 27, 28, 29, and 30. Tax lots in the study area are shown in Figure 2 in Appendix A.

Broadly, the study area is in the coast range ecoregion and the coastal lowlands subregion. This ecoregion is known for its mild temperatures and wet climate. The average annual precipitation in the Tillamook area is approximately 90 inches. Most precipitation arrives as rainfall from October to mid-May. The average temperature in Tillamook is 44 degrees Fahrenheit (°F) in winter and 58°F in summer (National Oceanic and Atmospheric Administration [NOAA], 2009–2010).

The study area is within the Tillamook Bay watershed and crosses through the Trask and Tillamook sub-basins. The east end of the study area travels through the Tillamook valley along the floodplain of the Trask and Tillamook rivers. It continues west to the timbered ridges above Oceanside City. The study area consists of a 300-foot-wide corridor along the preferred transmission line route. Specifically, the east end of the route starts west of the Tillamook substation and follows along the south side of Hoquarton Slough and the north side of Front Street from milepost (MP) 0.1 to MP1. It continues west, crossing the floodplain of the Trask River, Tillamook Channel, and Tillamook River (MP 1.1 to MP 2.6). The route heads west through private industrial forests (MP 2.9 to MP 7) until it reaches the proposed new Oceanside substation site.

Elevations within the study area range from approximately 3 to 4560 feet above mean sea level (Google Earth, 2011). Historical land uses in the study area include agricultural, logging, and fishing. Current land uses are still agricultural, logging, and fishing, along with commercial and residential uses.

B) Site Alterations
OAR141-090-0035 (7)(c)

Historically, much of Tillamook was a wetland (Tillamook County, 2008). Wetland draining and levee construction have allowed areas north and west of Hoquarton Slough to be developed for commercial and residential use. The following is a summary list of past events that have influenced current wetland conditions:

- Construction of levees and dikes and removal of wood jams to prevent flooding in the Tillamook watershed (1850s)
- Deforestation and creation of pasture and farmland in the Tillamook Basin (1863 to present)
- Hoquarton Slough cleared of snags and riparian vegetation by USACE (1889)
- Dredging and disposal of dredge spoils along the banks of the Hoquarton Slough and removal of riparian vegetation by USACE (1897 to 1919)
- Construction of dikes along portions of the Hoquarton Slough (1900 to 1901)
- Construction of U.S. Highway 101 in Tillamook County and opening of the Hoquarton Slough bridge (1931)
- Reforestation of the Tillamook Basin began, following fires (1949)
- Flooding caused large-scale damage north of Hoquarton Slough; the City and the Federal Emergency Management Agency began the process of moving businesses and residences out of the floodplain north of Hoquarton Slough (1996)
- Construction of roads, buildings, parking lots, and infrastructure in wetlands associated with the urbanization and industrialization of Tillamook (1970 forward)
- Construction of Hoquarton Interpretive Trail Park (2005)

C) Precipitation Data and Analysis
OAR141-090-0035 (7)(i)

Annual precipitation in the region averages approximately 90.4 inches of rain and 1.4 inches of snow for the water year (U.S. Department of Agriculture, Natural Resources Conservation Service [NRCS], 2002). Precipitation for the water year beginning October 2010 through the end of March 2011 was 44.34 inches (Weather Underground, 2011). Precipitation for the water year beginning October 2011 through the middle of August 2012 was 53.67 inches (Weather Underground, 2012). Table 1 presents the precipitation data for the 6-month period preceding the April 4, 2011, field investigation date. Precipitation data for the 2-week period preceding the April 4, 2011, field investigation totaled 3.38 inches. Precipitation during the field survey (April 4 –April 8, 2011) was 1.84 inches (Weather Underground, 2011). Table 2 presents the precipitation data for the 6-month period preceding the August 15, 2012, field investigation date. Precipitation data for the 2-week period preceding the August 15, 2012, field investigation totaled 4.41 inches. Precipitation during the field survey (August 15, 2012) was 0.00 inches (Weather Underground, 2012).

The precipitation was taken into consideration during observation or interpretation of wetland hydrology indicators or indicators of streamflow duration.

TABLE 1
Monthly Precipitation Data in Inches – April 4, 2011 Field Investigation

Date	Actual Precipitation	Normal Range*	Precipitation Outside Normal Range
October 2010	4.54	4.23–8.70	0
November 2010	9.49	9.90–16.17	{-0.41}
December 2010	8.61	10.06–16.45	{-1.45}
January 2011	7.83	8.64–15.70	{-0.81}
February 2011	5.57	7.86–12.70	{-2.29}
March 2011	8.30	7.25–11.64	0
Total	**44.34**	**47.94–81.36**	**-4.96**

Notes

*The range within which precipitation for the given period has a 70 percent chance of occurring.

Sources: NRCS, 2002; Weather Underground, 2011

TABLE 2
Monthly Precipitation Data in Inches – August 15, 2012 Field Investigation

Date	Actual Precipitation	Normal Range*	Precipitation Outside Normal Range
February 2012	5.28	7.86-12.70	(-2.58)
March 2012	9.49	7.25-12.70	0
April 2012	5.26	4.78-8.09	0
May 2012	4.76	3.30-5.77	0
June 2012	3.65	2.37-4.06	0
July 2012	0.37	0.80-2.01	(-0.43)
Total	**28.81**	**26.36-45.33**	**(-3.01)**

Notes

*The range within which precipitation for the given period has a 70 percent chance of occurring.

Sources: NRCS, 2002; Weather Underground, 2012

D) Methods
OAR 141-090-0030, OAR 141-090-0035 (7) (d-e), (g-h), (16) (a-b), (f), (d) or (g), (17), & (19-20)

The project's study area for this report is a 300-foot-wide corridor along the preferred transmission line route, as well as one short alternative route. Offsite determinations were made in some of the project area in the valley where access was restricted. LWI and NWI mapping was used in these areas as well as offsite roadway observations of vegetated community types.

Literature Review

Before the field investigation began, the following information was reviewed:

- City of Tillamook Local Wetland Inventory (LWI) maps (Wilson et al., 1996) (Figures 3a-3u in Appendix A)
- National Wetlands Inventory (NWI) maps—digital data (U.S. Fish and Wildlife Service [USFWS], 2010) (Figures 3a-3u in Appendix A)
- Tidal datum for Hoquarton Slough (DSL, 1989)
- Pacific Northwest Hydrography Framework (PNWHF) 24K Dataset—digital watercourse data
- Soil Survey Geographic Database of Tillamook County, Oregon (NRCS, 2007) (Figures 4a-4u in Appendix A)
- Hydric Soils List of Tillamook County, Oregon (NRCS, 2006)
- Aerial photographs (Figures 5a-5u in Appendix A)
- Topographic maps (Figures 6a-6u in Appendix A)

Field Study

The majority of the fieldwork was conducted over 5 days, April 4–8, 2011. Additional fieldwork to update minor alignment revisions was conducted August 15, 2012. Aerial photography signatures, suggesting inundation and potential wetland vegetation located in the same area as the NWI- and LWI-mapped wetlands, were also reviewed prior to the field investigation. NWI-mapped wetland identified from the review of existing information was field verified to determine whether it contained wetlands, or other waters (except when offsite determinations were required because of restricted access). Sample plots were located to characterize conditions within and immediately adjacent to potential wetlands (illustrated in Figures 6a-6u in Appendix A).

Field verification of drainages included observations of geomorphology, hydrology, and biology, as well as photo documentation. Potential waterways in the study area were mapped on to field maps (Figures 3a -3u in Appendix A) using Pacific Northwest Hydrography Framework stream mapping (PNHF, 2005). This mapping includes composite information on waterways from a variety of public agencies including U.S. Geological Survey (USGS), U. S. Bureau of Land Management (BLM), U.S. Forest Service (USFS), and Oregon Water Resources Department.. Because this mapping is conducted at a broad level and location and stream types are not all field verified, location, alignment, and stream type may vary from what appears on these maps. Ground Photography of potential waters may be found in Appendix C3.

CH2M HILL biologists visited all streams identified by the above mapping to verify presence, location, and alignment, and to make determinations regarding flow regimes. In some instances there was no evidence of the mapped streams as shown on the maps. This is often because initial mapping follows USGS topography mapping and the stream actually begins farther downslope than what is shown on the map. In other instances we found streams that were not mapped within the study area. These streams were generally upstream extensions of mapped streams.

The study are includes six waterways that are tidally influence. They include Hoquarton Slough (S01), Trask River (S02), Tillamook Channel (S03), Tillamook River (S04), Esther Creek (S05), and Tomlinson Slough (S06). The upper extent of jurisdiction for the tidally influenced streams is the *highest measured tide elevation,* 11.94 feet NAVD 88 (as given for Hoquarton Slough, the nearest reporting station). Based on review of USGS topography maps and FIRM floodplain mapping we concluded that the *highest measured tide elevation* either coincided with or was lower than top-of bank for each of these waterways. For the purpose of this study, we identified the upper extent of jurisdiction for these waterways as top-of-bank which we delineated on aerial site photos at a scale of 1 inch equals 200 feet.

Data collection, description, and analysis for wetlands and other jurisdictional waters of the United States followed procedures in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (Version 2.0) (U.S. Army Corps of Engineers [USACE], 2008) and in *Streamflow Duration Assessment Method for Oregon* (Nadeau, 2011).

The routine onsite wetland determination method was used to observe vegetation, soils, and hydrological conditions at representative locations. Paired sample plots were used to document wetland and upland areas adjacent to wetland boundaries. The *USFWS National List of Plant Species that Occur in Wetlands: Oregon Combined 1988 Region 9 List and 1993 Supplement List of Plant Species that Occur in Wetlands (Region 9)* (DSL, 2009) was used to determine the hydrophytic status of vegetation.

Desktop/Offsite Determination

A desktop study for wetlands was conducted using existing information (listed in the aforementioned literature review subsection) that included USGS topography, and LWI/ NWI maps and hydric soil where access was restricted or in one section, vegetation was too dense to access. Where possible, offsite areas were viewed from roadways during field

surveys, to note site characteristics. For the purpose of this study, wetlands mapped as NWI wetlands are assumed to be jurisdictional.

E) Description of Wetlands and Other Waters
OAR141-090-0035 (2),(7)(b), & (17)

Twenty-two wetlands were identified within the study area. Seventeen were delineated during field surveys and five were identified using the NWI mapping because of restricted access. Fourteen streams were delineated within the study area (Figures 6a-6u in Appendix A). Ground photographs of wetlands may be found in Appendix C1. Ground photographs of streams are found in Appendix C2.

Field-Surveyed Wetlands

W01 is 0.61 acres and is classified as a palustrine emergent (PEM)/depressional wetland. It is located on the east end of the study area (MP 0.1). The wetland is a low, flat field within the floodplain of Hoquarton Slough. Vegetation consists of wet meadow grasses with dominants of bentgrass (*Agrostis* sp.) and creeping buttercup (*Ranunculus repens*). Standing water with a varying depth of 0.25 to 3 inches was observed at the time of the site visit. The wetland boundary follows the toe of the slope and upland area characterized by a distinct shift in elevation. The wetland extends offsite to the north.

W02 which includes W02a (2.08 acre and W02b (3.456 acres) is classified as a palustrine scrub-shrub (PSS)/estuarine fringe embayment (EFB) wetland. It is located south of the Hoquarton Slough. The southern end of the wetland is divided by Hoquarton Trail crossing the wetland. Dominant vegetation includes willow (*Salix* sp.), Nutka rose (*Rosa nutkana*), and slough sedge (*Carex obnupta*). The wetland had standing water at the time of the site visit and has hydric soil mapped within depressions (Urban-land–Udorthents complex, 0 to 7 percent slope, flood [101B]). The wetland boundary is located below the knee of a gravel slope on both sides of the paved walkway. The wetland complex extends north of the study area.

W03 is 0.70 acres and is classified as a palustrine forested (PFO)/EFB wetland located along the shores of Hoquarton Slough. The wetland boundary follows the top of bank, with some fringe areas of emergent vegetation below the top of bank. Dominant vegetation includes reed canarygrass (*Phalaris arundinacea*) and some scattered red alder (*Alnus rubra*). The wetland complex extends north of the study area.

W04 is 0.45 acres and is classified as a PFO/depressional wetland located north of Front Street. Dominant vegetation includes red alder and slough sedge. The southern wetland boundary transitions to upland, with a shift in vegetation consisting of English ivy (*Hedera helix*) and Himalayan blackberry (*Rubus discolor*) as well as a higher ground elevation. The wetland extends north outside of the study area.

W05 is 5.76 acres, is classified as a PFO/PEM depressional wetland, and is part of a large wetland complex located west of W04 and adjacent to W07. Dominant vegetation is red alder, willow, salmonberry (*Rubus spectabilis*), cattail (*Typha latifolia*), and reed canarygrass. The wetland was predominantly inundated at the time of the site visit. The southern

wetland boundary transitions to upland, with higher ground elevation possibly related to the fill from the adjacent road prism, along with a shift in vegetation consisting of swordfern (*Polystichum munitum*) and blackberry. The wetland is part of a large wetland complex that extends north and west of the study area.

W08 is 7.37 acres and is classified as a PEM/flats wetland, located in the floodplain of the Trask River. The vegetation consists of wet pasture grasses. The mapped soil is a hydric soil series (Coquille-Brenner-Nehalem Association 0 to 3 percent protected [104A]). The southern end of the wetland boundary is defined by the edge of the adjacent road prism of Netarts Highway. The wetland is part of a larger wetland complex that extends north of the study area.

W09 is 0.87 acres and is classified as a PEM/flats wetland and located west of W08. A remnant of Stillwell Slough is in the northern portion of the wetland. Vegetation consists of wet pasture grasses, soft rush (*Juncus effusus*), and creeping buttercup. At the time of the site visit, the wetland was inundated to a depth of 2 inches. A hydric soil (Coquille-Brenner-Nehalem Association 0 to 3 percent [104A]) is mapped throughout the wetland. The southern wetland boundary follows the toe of the slope of the edge of the adjacent road prism of Netarts Highway. The wetland is part of a large wetland complex and extends west–northwest of the study area.

W10 is 2.12 acres and is classified as a PEM/flats wetland located north of Netarts Highway. Vegetation consists of wet pasture grasses. At the time of the site visit, the wetland was inundated to a depth of 2 inches. A hydric soil (Coquille-Brenner-Nehalem Association 0 to 3 percent [104A]) is mapped throughout the wetland. The southern wetland boundary follows the toe of the slope of the edge of the adjacent road prism of Netarts Highway. The wetland is part of a large wetland complex and extends north of the study area.

W11 is 2.48 acres and is classified as a PEM/flats wetland and located west and adjacent to W10 Vegetation consists of wet pasture grasses and creeping buttercup. At the time of the site visit, the wetland was inundated to a depth of 2 to 4 inches. A hydric soil (Coquille-Brenner-Nehalem Association 0 to 3 percent [104A]) is mapped throughout the wetland. The southern wetland boundary follows the toe of the slope of the edge of the adjacent road prism of Netarts Highway. The wetland is part of a large wetland complex and extends north and northwest along the Tillamook River.

W12 is 2.79 acres and is classified as a PSS/estuarine fringe river-sourced (EFR) wetland. It is located within the floodplain of the Tillamook Channel and the Tillamook River and is mapped on the NWI as PSSc/E2EMP. Dominant species in the shrub community are willow and salmonberry. Dominant species in the emergent community include slough sedge, saltgrass (*Distichlis spicata*), and soft rush. A hydric soil (Coquille-Brenner-Nehalem Association 0 to 3 percent [104A]) is mapped throughout the wetland. At the time of the site visit, the majority of the wetland had standing water with a depth of 6 inches and more. The east end of the wetland boundary is defined by a distinct shift in topography, most likely a result of fill material from the adjacent recreational-vehicle park. The wetland extends west–northwest and south of the study area.

W13 is 1.54 acres and is classified as a PSS/depressional wetland. It is separated from the west side of the Tillamook River by a low berm. The dominant vegetation is willow, reed

canarygrass, soft rush, and slough sedge. At the time of the site visit, the wetland had standing water at a depth of 6 to 8 inches. Mapped soil (Coquille silt loam, 0 to 1 percent slopes, diked [103A]) is listed as hydric. The wetland's eastern boundary is formed by the toe of the slope of the road prism of Netarts Highway. A portion of the southern wetland boundary follows along the toe of a fill slope from an adjoining parking lot. The wetland extends out of the study area to the north and south.

W15 is 0.22 acres and is classified as a PFO/depressional wetland. The wetland is located south, south west of the intersection of Netarts Highway and Bayocean Road. It is composed of two small depressions surrounded by fill material from a parking area. Dominant vegetation includes Sitka spruce (*Picea sitchensis*) and reed canarygrass at the outer edge of the depressions. Within the depressions, dominant vegetation is water parsley (*Oenanthe sarmentosa*). Wetland hydrology consists of standing water at a depth of 6 inches within the depressions and soil saturation at a depth of 7 inches near the wetland boundary. The wetland boundary is defined by fill material and lack of hydrology.

W18 is 0.04 acres and is classified as a PEM/slope wetland. It is located in an open area of forest ridge. The dominant vegetation is soft rush, slough sedge, and unknown grass. At the time of the site visit, standing water was observed flowing downslope in the wetland and soil was saturated to the surface. The wetland boundary follows a slight break in topography, as well as a distinct shift in vegetation from slough sedge and soft rush to swordfern and red elderberry.

W19 is 0.02 acres and is classified as a palustrine open water (POW)/depressional wetland. It is a "U"-shaped, small pond with steep sides and a mud substrate. At the time of the site visit, depth of water varied from 2 to 4 feet. The source of hydrology is potentially a spring and overland surface flow.

W20 is 0.01 acres and is classified as a PEM/depressional wetland. The wetland is located in a distinct depression. The dominant vegetation is skunk cabbage (*Lysichiton americanum*) and small-fruited bulrush (*Scirpus microcarpus*), with red alder located in the adjacent upland. Wetland hydrology is associated with adjacent slope subsurface and surface lateral flow. At the time of the site visit, the wetland was inundated with standing water at a depth of one inch. The wetland boundary is defined by a distinct rise in topography and by a change in vegetation from hydrophytic vegetation to swordfern and salal.

W21 is 0.01 acres and is classified as a PEM/depressional wetland. It is located adjacent to W20. The dominant vegetation is skunk cabbage and small-fruited bulrush, with red alder located in the adjacent upland. The wetland is located in a distinct depression. Wetland hydrology is associated with the adjacent slope, subsurface, and surface lateral flow. At the time of the site visit, the wetland was inundated with standing water at a depth of one inch. The wetland boundary is defined by a distinct rise in topography and by a change in vegetation from hydrophytic vegetation to swordfern and salal.

Offsite Wetland Determination

Offsite determinations were made because of restricted access or inaccessible due to dense brush. Five unverified LWI- and NWI-mapped wetlands (W07,W14,W16,W17 , W22 and a

small portion of W05) were identified in the desktop study area (Figures 3a-3u). Hydric soils were identified within the desktop study area (Figures 4a-4u).

The western portion of W05 is mapped on the NWI as PEMc and PSSc. This area was inaccessible to due dense brush. It is a low lying area. Vegetation observed from offsite consisted of dense stands of willow. The soil survey maps hydric soil (Coquille silt loam 0 to 1 percent.

W07 is 7.37acres and is mapped on the NWI as a PEMAd wetland. Vegetation observed from offsite consists of pasture grasses. The wetland appears to follow the top of the bank of a drainage ditch that surrounds the pasture. The soil survey maps hydric soil (Coquille silt loam 0 to 1 percent diked [103A]) within this area. Standing water was observed on the field.

W14 is 1.43 acres and is mapped on the NWI as a PEMAdh wetland. Vegetation observed from the roadway consists of wet pasture grasses and creeping buttercup. At the time of the off-site determination visit, areas of standing water were observed on the field. The Tillamook County soil survey mapped urban land-Udorthents complex 0 to 7 percent slopes and Coquille silt loam, 0 to 1 percent slopes diked a hydric soil unit within this area. The southern wetland boundary follows the toe of the slope of the edge of the adjacent road prism of Bayocean Road. A portion of Tomlinson Slough is located north of the wetland. The wetland is part of a larger wetland complex that extends north.

W16 is 1.59 acres and is mapped on the NWI as a PEMAdh wetland. Vegetation, which was observed from the road, consists of pasture grasses, creeping buttercup, and skunk cabbage. The soil survey mapped Condorbridge gravelly medial loam, which contains inclusions of listed hydric soil. Standing water was observed on portions of the field.

W17 is 2.64 acres and is mapped on the NWI as a PEMAd wetland. Vegetation, which was observed from the road, consists of pasture grasses, creeping buttercup, slough sedge, and skunk cabbage. The soil survey mapped Condorbridge gravelly medial loam, which contains inclusions of listed hydric soil. Standing water was observed on portions of the field. The wetland appears to be bound by a slope to the west and south, a road to the east, and a home to the north.

W22 is 2.51 acres and is mapped on the NWI as PFOA and PEMCd. Vegetation is unknown but appears composed of grass and emergent species. Two hydric soils are mapped in this area: Nestucca-Brenner silt loam, 0 to 3 percent slopes, and Coquille-Brenner-Nehalem Association 0 to 3 percent slopes, protected.

Table 3 lists the wetlands delineated within the study area.

TABLE 3
Wetlands within the Study Area

Wetland ID	Acres	Cowardin[a] Class	HGM Class[b]	Clean Water Act Section 404 Jurisdiction	Oregon Removal-Fill Law Jurisdiction
W01	0.61	PEM	Depressional	Yes(PJD)	Yes (PJD)
W02a	2.08	PSS	Depressional	Yes(PJD)	Yes (PJD)
W02b	3.56	PFO	EFB	Yes(PJD)	Yes (PJD)
W03	0.70	PEM	EFB	Yes(PJD)	Yes (PJD)
W04	0.45	PFO	Depressional	Yes (PJD)	Yes (PJD)
W05 (partial access)	5.76	PFO/PEM	Depressional	Yes (PJD)	Yes (PJD)
W07 (no access)	7.37	PEM	Flats	Unknown	Unknown
W08	2.88	PEM	Flats	Yes (PJD)	Yes (PJD)
W09	0.87	PEM	Flats	Yes (PJD)	Yes (PJD)
W10	2.12	PEM	Flats	Yes (PJD)	Yes (PJD)
W11	2.48	PEM	Flats	Yes (PJD)	Yes (PJD)
W12	2.79	PSS	EFR	Yes (PJD)	Yes (PJD)
W13	1.54	PSS/PEM	Depressional	Yes (PJD)	Yes (PJD)
W14 (no access)	1.43	PEM	Flats	Unknown	Unknown
W15	0.22	PFO	Depressional	Yes (PJD)	Yes (PJD)
W16 (no access)	1.59	PEM	Flats	Unknown	Unknown
W17 (no access)	2.64	PEM	Flats	Unknown	Unknown
W18	0.04	PEM	Slope	Yes (PJD)	Yes (PJD)
W19	0.02	POW	Depressional	Yes (PJD)	Yes (PJD)
W20	0.01	PEM	Depressional	No (PJD)	Yes (PJD)
W21	0.01	PEM	Depressional	No (PJD)	Yes (PJD)
W22 (no access)	2.51		Unknown	Unknown	Unknown
Total	36.36				

Notes

[a] Cowardin et al., 1979

[b] Adamus, 2001

EFB = Estuary Fringe Embayment

PEM = Palustrine Emergent

PFO = Palustrine Forested

PJD = Preliminary Jurisdictional Determination. PJDs are advisory only. Final jurisdictional determinations are made by the regulatory agencies.

POW = Palustrine Open Water

PSS = Palustrine Scrub-shrub

Other Waters

The study area is part of the Tillamook Bay watershed within the north coast basin. Five major tributaries make up the freshwater contribution to the Tillamook Bay. The study area project area crosses two of these tributaries: the Trask River and Tillamook River.

Fourteen streams were mapped in the field study area (Table 4; Figures 6a-6u). Ground photographs of streams may be found in Appendix C2. Locations of areas that PNWHF digital watercourse data identified as drainage (but that were not observed during the field investigation) are shown in Appendix C3.

TABLE 4
Stream Channels within the Study Area

Stream Reach ID	Stream Name	Flow Regime	Width at Widest Point (feet)	Preliminary Jurisdictional Determination,*Clean Water Act Section 404	Preliminary Jurisdictional Determination,*Oregon Removal-Fill Law
S01[1]	Hoquarton Slough	Perennial	-	Yes	Yes
S02[1]	Trask River	Perennial	-	Yes	Yes
S03[1]	Tillamook Channel	Perennial	-	Yes	Yes
S04[1]	Tillamook River	Perennial	-	Yes	Yes
S05[1]	Esther Creek	Perennial	-	Yes	Yes
S06[1]	Tomlinson Slough	Perennial	-	Yes	Yes
S07	Tributary of Tomlinson Slough	Intermittent	1.5	Yes	Yes
S08	Tributary of Tomlinson Creek	Intermittent	10	Yes	No
S09	Unnamed drainage	Intermittent	4	Yes	Yes
S10	Unnamed drainage	Intermittent	3	Yes	Yes
S11	Unnamed drainage	Intermittent	4	Yes	Yes
S12	Unnamed drainage	Perennial	3	Yes	Yes
S17	North Branch Fall Creek	Perennial	20	Yes	Yes
S21	Tomlinson Creek	Perennial	15	Yes	Yes

[1] *highest measured tide elevation*, 11.94 feet NAVD 88
* Jurisdictional determinations, including the applicability of exemptions, are preliminary only. Final determinations are made by the regulatory agencies.

Determination of flow regime was made based on best professional judgment of the CH2M HILL biologists using characteristics described in the Streamflow Duration Assessment Method for Oregon() (Nadeau, 2011).. Characteristics considered include channel width, depth, and gradient, in-channel structure and sequences, presence and type of erosional and depositional features, channel sinuosity, and potential presence of fish, amphibians, and/or macro-invertebrates.

In the field investigation, all streams in the mountain area (MP 2.9 – 7.0) were considered to be at least intermittent due to the likelihood of carrying continuous flow for at least three months of the year. Streams were considered perennial if they exhibited additional

characteristics as described above. The widths of potential waters were estimated in the field [Ordinary High Water Mark to Ordinary High Water Mark (OHWM to OHWM)].

All of the streams in the lowland area (MP 0.0 to 2.9) were determined to be perennial and tidally influenced: Hoquarton Slough, Trask River, Tillamook River, Tillamook Channel, Esther Creek, and Tomlinson Slough. Hoquarton Slough flows west and traverses the study area from east to west until it combines with Dougherty Slough, which flows into the Trask River, which then flows west into Tillamook Bay and the Pacific Ocean. The Trask River is one of the five freshwater tributaries of the Tillamook Bay. It flows south to north into Tillamook Bay and the Pacific Ocean. The Tillamook River (Lower Tillamook River [171002030302]) also one of the five freshwater tributaries of the bay, crosses the study area, flowing north into Tillamook Bay and the Pacific Ocean. The Tillamook Channel flows west from the Trask River to the Tillamook River (north of the study area), which flows west into Tillamook Bay and the Pacific Ocean. Esther Creek flows north–northeast and flows into the Tillamook River. Tomlinson Slough drains to the Tillamook River.

The upper extent of jurisdiction for the tidally influenced streams is the *highest measured tide elevation,* 11.94 feet NAVD 88 (as given for Hoquarton Slough, the nearest reporting station). Based on review of USGS topography maps and FIRM floodplain mapping we concluded that the *highest measured tide elevation* either coincided with or was lower than top-of-bank for each of these waterways. For the purpose of this study, we identified the upper extent of jurisdiction for these waterways as top-of-bank which we delineated on aerial site photos at a scale of 1 inch equals 200 feet.

Upland Vegetated Swales

The mapped drainages that did not contain stream channels were all upland vegetated swales. These swales generally were vegetated with upland vegetation such as Western Hemlock, Ponderosa pine, Salal, and swordfern. They did not have scoured beds, OHW marks, or other indicators of recent flow. Ground photographs of these drainages are provided in Appendix C3. Mapped locations of these drainages are provided in Appendix A, Figure 3.

F) Deviation from Local Wetland Inventory or National Wetlands Inventory

OAR141-090-0035(16)(e)

LWI- and NWI-mapped wetlands occur throughout the study area. Delineated wetland boundaries closely match those shown on LWI and NWI maps in the lower valley areas. The Tillamook LWI extends to the limits of the City of Tillamook. No LWI was available for the forested sections of the study area (MP 2.9–7.0). The wetland boundaries mapped during the field investigation vary from those identified on the NWI maps of these areas. NWI mapping in the forest shows wetlands along drainages that were not delineated as wetlands during the field investigation. The mapping method used during the field investigation is more precise for wetland delineation than are those used for mapping with NWI.

G) Wetland Mapping Method
OAR141-090-0035(7)(f), (11), (12),(13),(18), and (22)

Wetland sample plot locations and boundaries of wetlands were mapped within the study area using a hand-held, Trimble GeoXT, geographic positioning system (GPS) unit with submeter accuracy capability. Where precise topographic data were available, wetland boundaries were digitally drawn on a topographic map using ArcMap geographic information system (GIS) software. Acreages of wetlands within the study area boundaries were calculated using GIS software. The estimated accuracy of mapped wetland boundaries, study area, and sample plot locations is plus or minus 3 feet.

Streams were mapped by using existing PNW watercourse mapping, following field-verification. Stream locations in the field varied significantly from the PNW mapping at a small number of sites. For these sites, the stream mapping was edited to reflect the field observations. Editing was based on air photo interpretation and field observations.

Tax lot boundaries are from data provided by Tillamook County (Figure 2a-2u in Appendix A).

H) Additional Information

OAR41-085-0015(1-7), OAR141-090-0030(2), OAR141-090-035(6)(c),(16)(c), & (21)

No additional information.

I) Results and Conclusions
OAR141-090-0035(7)(i)

All field-verified drainages meet criteria for jurisdiction under the Oregon Removal-Fill Law as a perennial waterway. The Hoquarton Slough, Tillamook and Trask rivers, Esther Creek, and Tillamook Channel meet criteria for jurisdiction under the Rivers and Harbors Act because they are subject to the ebb and flow of tides and under the Clean Water Act because they are relatively permanent waters (RPW) that flows into the Pacific Ocean.

All of the wetlands and other waters identified in this report are potentially subject to federal and/or state jurisdiction. Jurisdictional determinations, including the applicability of exemptions, are made by the regulatory agencies on a case-by-case basis.

The regulatory conclusions in this report are provided as preliminary jurisdictional determinations (PJDs) and are listed in Tables 3 and 4. PJDs, including the applicability of exemptions, are advisory only. Desktop-surveyed wetlands will be field verified before PJDs are made. Final determinations are made by the regulatory agencies.

Waters of the State

Waters of the state include "all natural waterways, tidal and nontidal bays, intermittent streams, constantly flowing streams, lakes, wetlands, that portion of the Pacific Ocean that is in the boundaries of this state, [and] all other navigable and nonnavigable bodies of water in this state…." (OAR 141-085-0510(91)). Furthermore, intermittent streams are defined as "any stream which flows during a portion of every year and which provides spawning, rearing or food-producing areas for food and game fish" (OAR 141-085-0510(43)). "Food-producing areas" are not defined.

Intermittent Streams

Three intermittent stream channels (S09, S10, and S11) are potentially jurisdictional under the Oregon Removal-Fill Law because they are food-producing areas for food and game fish.

Waters of the United States

USACE asserts jurisdiction over the following waters:

- Traditional navigable waters (TNW)
- Wetlands adjacent to TNWs
- Nonnavigable tributaries of TNWs that are RPWs, where the tributaries typically flow year-round or have continuous flow at least seasonally (that is, typically 3 months)

- Wetlands that directly abut (that is, have a continuous surface connection to) such tributaries (U.S. Environmental Protection Agency [EPA] and USACE, 2008)

USACE will decide jurisdiction over the following waters based on a fact-specific analysis to determine whether they have a significant nexus with a TNW:

- Nonnavigable tributaries that are not relatively permanent
- Wetlands adjacent to nonnavigable tributaries that are not relatively permanent
- Wetlands adjacent to but that do not directly abut a relatively permanent nonnavigable tributary (EPA and USACE, 2008)

A "significant nexus" is determined through analysis of "the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical and biological integrity of downstream TNWs" (EPA and USACE, 2008).

USACE will decide jurisdiction over isolated (that is, nonadjacent) wetlands and waters based on a fact-specific analysis to determine whether impacts to those wetlands or waters could affect interstate commerce.

Traditional Navigable Waters (TNWs)

There are no traditional navigable waters in the site boundary. The nearest downstream TNW for all of the streams in the study area is the Tillamook Bay (USACE Portland District, 1994 and 2008).

Relatively Permanent Waters and Abutting Wetlands

Streams S01 through S21 contain wetlands within their banks, springs, seeps, or some evidence of groundwater discharge within or adjacent to their stream channels and are potentially RPWs. Wetlands W02, W03, W04, W12, and W13 abut stream S01; wetlands W12 and W16 abut streams S04 and S05; and wetland W20 abuts stream S12. The reaches of these streams and wetlands are considered jurisdictional until a final determination is made by USACE.

Non-RPWs and Adjacent Wetlands

No ephemeral streams were identified within the study area.

Isolated Waters and Wetlands

No isolated waters or wetlands were identified.

J) Disclaimer

This report documents the investigation, best professional judgment, and conclusions of the investigator. It is correct and complete to the best of my knowledge. It should be considered a Preliminary Jurisdictional Determination of wetlands and other waters and used at your own risk unless it has been reviewed and approved in writing by the Oregon Department of State Lands in accordance with OAR 141-090-0005 through 141-090-0055 and by the U.S. Army Corps of Engineers, Portland District.

Jurisdictional determinations, including the applicability of exemptions, are made on a case-by-case basis by DSL and USACE.