Attachment O
High Tide Line and Ordinary High Water Mark Determination

moffatt & nichol

915 Broadway Street, Ste. 100
Vancouver, WA 98660

(206) 622-0222
www.moffattnichol.com

MEMORANDUM

To: File

From: Taylor Meyers and Amber Roesler, Moffatt & Nichol

CC:

Date: 11/3/22

Subject: Port of Grays Harbor Terminal 4 HTL and OHWM Determination

M&N Job No.: 221760

High Tide Line Determination

Pursuant to 33 CFR Part 328.3, the term high tide line "*means the line of intersection of the land with the water's surface at the maximum height reached by a rising tide. The high tide line may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gages, or other suitable means that delineate the general height reached by a rising tide. The line encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm*."

In 2022, the USACE Seattle district provided three preferred methods for delineating the high tide line (HTL) (USACE 2022):

1.) Identify the 10-year average high tide based on future predicted tide data and supplement this finding with a field delineation.

2.) Use the 10-year average high tide as the HTL.

3.) Use the highest astronomical tide (HAT) as the HTL.

The HTL for Terminal 4 at the Port of Grays Harbor (herein referred to as 'Project Site') was identified using Method 2. A total of 10 years of future predicted tide levels from January of 2022 through December of 2031 were reviewed using data from NOAA tide gage 9441187 in Aberdeen, WA, approximately 0.6 miles west of the Project Site. The annual highest predicted tides are summarized in Table 1 below. Based on the described method, The 10-year average high tide for NOAA tide gage 9441187 and the anticipated HTL for the Project Site is 12.22 ft MLLW.

Table 1. Annual Predicted Highest High Tide

HTL Determination	
Year	**Highest High Tide (ft MLLW)**
2022	12.278
2023	12.138
2024	12.22
2025	12.39
2026	12.258
2027	12.057
2028	12.099
2029	12.346
2030	12.325
2031	12.029
Average	**12.214**

Ordinary High Water Mark Determination

Pursuant of the Washington Administrate Code (WAC) 173-22-030(11) the OHWM is defined as *"That mark that will be found by examining the bed and banks and ascertaining where the presence and action of waters are so common and usual, and so long continued in all ordinary years, as to mark upon the soil a character distinct from that of the abutting upland, in respect to vegetation as that condition exists on June 1, 1971, as it may naturally change thereafter, or at it may change thereafter in accordance with permits issued by a local government or the Department of Ecology."*

Pursuant of the Washington Department of Ecology (Ecology) guidance "*in any area where the ordinary high-water mark cannot be found, the ordinary high water mark adjoining salt water shall be the line of mean higher high tide and the ordinary high-water mark adjoining fresh water shall be the line of mean high water"* (Ecology 2016).

The permitted 2019, BHP Grays Harbor Potash Export Facility project identified an OHWM of 10.11 ft MLLW at Terminal 3. This OHWM was field delineated in July of 2019 and is equivalent to the MHHW for the Aberdeen NOAA Tide Gage (Station ID 9441187) (WSP 2019)

Terminal 3 is approximately 3.5 miles west of the Project Site. Given the proximity of Terminal 3 to Terminal 4, the OHWM at Terminal 3 is anticipated to be representative of the OHWM at the Project Site. To confirm the applicability of using the Terminal 3 OHWM, tidal datums were obtained at the Project Site and compared to tidal datums at Terminal 3 using VDatum ver. 4.5 (NOAA 2022) (Table 2). Tidal datums at the Aberdeen NOAA Tide Gage (Station ID 9441187) are also reported in Table 2. Tidal datums were similar and it was therefore determined appropriate to use the Terminal 3 OHWM for the Project site. The OHWM at the Project Site is anticipated to be 10.11 ft MLLW.

Table 2. Tidal Datums and Water Levels in Feet MLLW

Datum Description	Abbreviation	Terminal 3 Obtained Using Vdatum	Terminal 4 Obtained Using Vdatum
Mean Higher High Water	MHHW	10.03	10.16
Mean High Water	MHW	9.33	9.47

Datum Description	Abbreviation	Terminal 3 Obtained Using Vdatum	Terminal 4 Obtained Using Vdatum
Mean Tide Level	MTL	5.42	5.46
Mean Sea Level	MSL	5.54	5.60
Mean Low Water	MLW	1.49	1.46
North American Vertical Datum 1988	NAVD88	1.79	1.87
Mean Lower Low Water	MLLW	0.0	0.0