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**Humboldt Bay Harbor, Recreation
and Conservation District**
(707) 443-0801
P.O. Box 1030
Eureka, California 95502-030



**NOTICE OF PREPARATION
OF DRAFT ENVIRONMENTAL IMPACT REPORT**

Date: September 30, 2026
Project Title: Humboldt Bay Offshore Wind Heavy Lift Multipurpose Marine Terminal Project
Project Location: Humboldt Bay, California
Lead Agency: Humboldt Bay Harbor, Recreation and Conservation District

This notice announces that a California Environmental Quality Act (CEQA) Draft Environmental Impact Report (DEIR) is being developed for the Humboldt Bay Offshore Wind Heavy Lift Multipurpose Marine Terminal Project (Project). The DEIR will identify, evaluate and disclose possible environmental effects of the Project. The Humboldt Bay Harbor, Recreation and Conservation District (District) is the project proponent and the CEQA Lead Agency.

As specified in the CEQA Guidelines, the NOP will be circulated for a 30-day review and comment period. Agencies, organizations, and interested members of the public are invited to provide input on the scope of the environmental analysis. If you are a responsible or trustee agency, the views of your agency are requested as to the scope and content of the environmental information which is germane to your agency's statutory responsibilities in connection with the proposed project. In the event that no response or no well justified request for additional time is received by any responsible agency or trustee agency by the end of the review period, we presume that these agencies have no response. Comments may be submitted in writing during the review period and addressed to:

Chris Mikkelsen
Humboldt Bay Harbor, Recreation and Conservation District
P.O. Box 1030
Eureka, California 95502-1030
707-443-0801

projectcomments@humboldtbay.org

The NOP comment period begins on September 30, 2026 and closes at 5:00 p.m. on November 30, 2026. All comments concerning the scope of the DEIR must be submitted in writing to the District via either mail or email addresses above prior to the close of the public comment period as noted above. Please indicate a contact person in your comment letter. The District will consider all written comments received during the noticed public review period in the preparation of the DEIR.

**Environmental Impact Report Notice of Preparation
Humboldt Bay Offshore Wind Heavy Lift Multipurpose Marine Terminal Project**

Public Scoping Meeting

The District will hold scoping meetings to provide opportunities for agency staff and interested members of the public to submit comments on the scope of the environmental issues to be addressed in the DEIR. Two scoping meetings will be held on November 4, 2026. A meeting for agencies will be held on November 4, 10:00 am, and a Public Meeting will be held on November 4 at 5:30 pm. Both meetings will be held at the Eureka Veterans Memorial Hall, 1018 H Street, Eureka, CA 95501. Written comments regarding relevant issues may be submitted at the meeting.

Project Background

The State of California (State) has established goals of deploying 5 gigawatts (GW) of offshore wind energy by 2030 and 25 GW by 2045. Studies by the Federal Bureau of Ocean Energy Management (BOEM), the National Renewable Energy Laboratory (NREL), and the California Energy Commission (CEC) have indicated that major port development will be required throughout California for offshore wind energy goals to be realized.

BOEM has leased three sites near Morro Bay, California, and two sites near Humboldt Bay to private offshore wind energy (OSW) developers. The Harbor District is designing the Project to support OSW development for these leases and potentially other future leases where OSW will be developed on the U.S. West Coast. As necessary, the development and operations of offshore wind farms are expected to be analyzed in a separate California Environmental Quality Act (CEQA) document prepared by the California State Lands Commission and a National Environmental Policy Act (NEPA) document prepared by BOEM. Offshore wind farms and associated energy transmission are not included in the Project.

Unlike the U.S. East Coast, where fixed foundations are used for turbine installations, the West Coast ocean floor is much deeper, and floating foundations are necessary. It is anticipated that turbines installed off California's coast will have a capacity of 15 megawatts (MW) or greater. For the purposes of this analysis, 20 MW turbines were assumed for terminal design. Components for a 15+ MW turbine are so large that the only feasible way to transport them from one location to another is by waterborne transit. Road and rail transit will not be feasible. Therefore, port infrastructure is an essential part of achieving the OSW goals. In addition, assembly in open-water is not practical; therefore, floating foundations, towers, nacelles, and blades must be assembled within ports and the fully assembled WTG is towed to the offshore wind site.

The terminal will serve primarily as a facility for the staging and integrating of the WTG components and may manufacture concrete foundations. The marine infrastructure and upland improvements are required to prepare the terminal for use by OSW developers. Although the OSW industry is the proposed anchor tenant of the modernized port facilities, in the future, the multipurpose facilities could accommodate other uses. The specific OSW developer(s) are not yet identified, nor are the contractors that may be selected to develop the site on behalf of the OSW developer(s). Offshore wind farms and associated energy transmission are not included in the Project.

Project Location

The Project area is located on the Samoa Peninsula along Humboldt Bay, with the wet storage area located in the Bay east and southeast of the terminal area. Some minor Project components are located approximately 1.25 mile from the terminal on Woodley Island in Humboldt Bay (**Figure 1**). In addition, it is anticipated that

there will be one or more offsite mitigation areas within the vicinity of Humboldt Bay. The proposed project is located on the Samoa Peninsula of Humboldt Bay in Humboldt County California (Figure 1). The site was formerly used by the forest product industry for wood processing and shipping. Existing uses include storage of commercial fishing equipment, commercial fish landing/holding, limited forest product storage, and mariculture. Much of the site is currently vacant. There are remnants from past forest product industry uses at the site including utilities, buildings, docks, and other structures. This infrastructure is generally failing and in need of repair, replacement, or demolition.

Project Objectives

The Project's objectives are to:

- Redevelop and repurpose a blighted and largely unutilized industrial site that formerly operated for decades as a major regional employment center.
- Create a diversity of new jobs and stimulate regional economic development.
- Develop a project that establishes Humboldt Bay as a global leader in addressing climate change and energy decarbonization by serving a critical role in offshore wind-related renewable energy development.
- Develop a facility that can contribute to the State goals of deploying 5 GW of offshore wind energy by 2030 and 25 GW of offshore wind energy by 2045.
- Provide the facilities and infrastructure required for Humboldt Bay to serve as the first floating offshore wind staging and integration port in California.
- Design and construct the site in such a way that it can serve multiple purposes, either simultaneously with the OSW functions or after. Additional purposes could include breakbulk, dry bulk, wood product manufacturing/shipping, cargo laydown/storage/ transport, and/or other related maritime transport uses that require heavy-lift wharfs and large laydown yards.
- Develop a marine terminal site with modern environmental standards related to minimization of greenhouse gas emissions, on-site renewable energy generation, green building materials, the electrification of terminal operations, dark-sky design features, and the facilities needed to accommodate vessel shore power.
- Prepare the site for sea-level rise.
- Address and manage residual soil contamination if encountered at the site.
- Generate revenue that can be used for general Harbor District purposes throughout the rest of Humboldt Bay, including year-round maintenance of channel and marina depths, conservation, ecological restoration, and recreation programs.

Project Description

The Humboldt Bay Harbor, Recreation, and Conservation District (Harbor District), as a Trustee Agency, is proposing the Humboldt Bay Offshore Wind Heavy-Lift Marine Terminal Project (Project), which will redevelop a marine terminal on an approximately 180-acre site at the Port of Humboldt Bay, California (Figure 1). The Project will provide a new multipurpose, heavy-lift marine terminal facility to support the offshore wind energy industry and, potentially, in the future, other coastal-dependent industries. The Project also includes a 30-acre solar array and 1.2 mile long bike path adjacent to the terminal site but outside of the 180-acre terminal area, and additional improvements on Woodley Island to support the fishery and recreation communities.

The Project will serve primarily as a facility for the vertical integration, launching, and long-term maintenance of fully assembled offshore floating wind turbine generators (WTGs). The terminal will also serve as a facility

for the manufacturing, importing, staging, and preassembly of various WTG components, including the assembly of floating foundations for WTGs.

For purposes of CEQA analysis, the Project is divided into two main component areas: onsite and offsite. The onsite areas are further broken down into four subareas based on location: upland development, marine development, wet storage, and habitat mitigation. The offsite area includes the related project features on Woodley Island, approximately 1.25 mile from the terminal. These areas are defined below and, together, comprise the full Project area evaluated under CEQA (Figure 2a and 2b).

- Onsite area encompasses the landside terminal and associated wharves, access road improvements, the solar array, utilities, buildings and the Great Redwood Trail Authority (GRTA) bike path, as well as the associated wet storage areas.
- Offsite improvements include related project features located on Woodley Island, which are an improved dock and storage area as well as a new Woodley Island Waterfront Recreation Center (Sailing Center).
- Onsite areas are further broken down into the following subareas:
 - Upland development subarea: terminal and onsite areas landward (west) of Humboldt Bay (not including the approximately 9-acre Habitat Restoration Subarea). An area of approximately 207 acres.
 - Marine development subarea: extends from the top of the bank and into the bay to the federal navigation channel. An area of approximately 87 acres.
 - Wet storage subarea: includes wet storage (staging) areas and sinking basin located in the bay east of the terminal, on the east side of the federal navigation channel and northeast of the terminal, at the terminus of the federal navigation channel. An area of approximately 117 acres.
 - Habitat mitigation subarea: location on the north side of the terminal area, directly adjacent to the Bay that will serve as an onsite mitigation area for terrestrial impacts at the terminal. An area of approximately 9 acres.

Construction of the Project will include dredging marine sediments to deepen portions of the channel, demolition of all existing structures within the terminal area, relocation of three existing uses (i.e., mariculture, commercial fishing equipment storage, and a commercial fish landing/live-holding facility) to off-site locations, construction of marine infrastructure, and the land-side improvements necessary to support WTG assembly and operation of the Project. In addition, the Project is anticipated to include habitat restoration to mitigate impacts on freshwater wetlands, environmentally sensitive habitat areas (ESHAs), eelgrass (*Zostera marina*), osprey (*Pandion haliaetus*) nests, and fish and marine mammal species. The Project will also address the conversion of intertidal to subtidal habitat and increased benthic cover.

Construction is anticipated to be completed in three phases. Phase 0 will first develop the improvements to the North and West access roads, as well as construct a new utility corridor, a new solar array, and the on-site habitat restoration areas. Phase 0 will also include demolition of the existing materials within the terminal area. Phase 1 will consist of development of the majority of the terminal area (150 acres) and all wet storage areas. This phase will include all dredging, construction of the northern wharf, partial construction of the southern wharf, and development of buildings and infrastructure on the upland subarea. Phase 2 will include developing the remaining 30-acre portion of the terminal and expanding the southern wharf.

A full project description is attached as Attachment 1.

**Environmental Impact Report Notice of Preparation
Humboldt Bay Offshore Wind Heavy Lift Multipurpose Marine Terminal Project**

Key Environmental Issues to be Addressed in Environmental Impact Report

The DEIR will describe the reasonably foreseeable and potentially significant impacts of the proposed project (both direct and indirect). The DEIR will evaluate the cumulative impacts of the project when considered in conjunction with other related past, present, and reasonably foreseeable future projects. The DEIR will evaluate the full range of environmental topic areas required under CEQA:

• Aesthetics	• Mineral Resources
• Agriculture / Forestry Resources	• Noise
• Air Quality	• Population / Housing
• Biological Resources	• Public Services
• Cultural Resources	• Recreation
• Energy	• Transportation
• Geology / Soils	• Tribal Cultural Resources
• Greenhouse Gas Emissions	• Utilities / Service Systems
• Hazards and Hazardous Materials	• Wildfire
• Hydrology / Water Quality	• Cumulative Effects
• Land Use and Planning	• Growth Inducing Effects

When environmental documentation for this project is complete, it will be available for review at the District's office at: 601 Startare Drive, Eureka, CA 95501 and online at: www.humboldtbay.org.

1.1 Introduction

The Humboldt Bay Harbor, Recreation, and Conservation District (Harbor District), as a Trustee Agency,¹ is proposing the Humboldt Bay Offshore Wind Heavy-Lift Marine Terminal Project (Project), which will redevelop a marine terminal on an approximately 180-acre site at the Port of Humboldt Bay, California (**Figure 1**). The Project will provide a new multipurpose, heavy-lift marine terminal facility to support the offshore wind energy industry and, potentially, in the future, other coastal-dependent industries. The Project also includes a 30-acre solar array and 1.2 mile long bike path adjacent to the terminal site but outside of the 180-acre terminal area, and additional improvements on Woodley Island to support the fishery and recreation communities.

The Project will serve primarily as a facility for the vertical integration, launching, and long-term maintenance of fully assembled offshore floating wind turbine generators (WTGs). The terminal will also serve as a facility for the manufacturing, importing, staging, and preassembly of various WTG components, including the assembly of floating foundations for WTGs.

For purposes of CEQA analysis, the Project is divided into two main component areas: onsite and offsite. The onsite areas are further broken down into four subareas based on location: upland development, marine development, wet storage, and habitat mitigation. The offsite area includes the related project features on Woodley Island, approximately 1.25 mile from the terminal. These areas are defined below and, together, comprise the full Project area evaluated under CEQA (**Figure 2a and 2b**).

- **Onsite area** encompasses the landside terminal and associated wharves, access road improvements, the solar array, utilities, buildings and the Great Redwood Trail Authority (GRTA) bike path, as well as the associated wet storage areas.
- **Offsite improvements** include related project features located on Woodley Island, which are an improved dock and storage area as well as a new Woodley Island Waterfront Recreation Center (Sailing Center).

Onsite areas are further broken down into the following subareas:

- **Upland development subarea:** terminal and onsite areas landward (west) of Humboldt Bay (not including the approximately 9-acre Habitat Restoration Subarea). An area of approximately 207 acres.

¹ As defined under California Environmental Quality Act (CEQA) Guidelines Section 15386, a Trustee Agency is a state agency that has jurisdiction over natural resources affected by a project that are held in trust for the people of California. Trustee Agencies include the California Department of Fish and Wildlife, the State Lands Commission, the State Department of Parks and Recreation, and the University of California. Upon establishment of the Harbor District in the 1970s, the State of California granted the Harbor District, in trust, all ungranted tide and submerged lands in Humboldt Bay and provided that the Cities of Arcata and Eureka could transfer all or a portion of its grants to the district as well. Accordingly, the Harbor District is considered a Trustee Agency.

- **Marine development subarea:** extends from the top of the bank and into the bay to the federal navigation channel. An area of approximately 87 acres.
- **Wet storage subarea:** includes wet storage (staging) areas and sinking basin located in the bay east of the terminal, on the east side of the federal navigation channel and northeast of the terminal, at the terminus of the federal navigation channel. An area of approximately 117 acres.
- **Habitat mitigation subarea:** location on the north side of the terminal area, directly adjacent to the Bay that will serve as an onsite mitigation area for terrestrial impacts at the terminal. An area of approximately 9 acres.

Construction of the Project will include dredging marine sediments to deepen portions of the channel, demolition of all existing structures within the terminal area, relocation of three existing uses (i.e., mariculture, commercial fishing equipment storage, and a commercial fish landing/live-holding facility) to off-site locations, construction of marine infrastructure, and the land-side improvements necessary to support WTG assembly and operation of the Project. In addition, the Project is anticipated to include habitat restoration to mitigate potential impacts on freshwater wetlands, environmentally sensitive habitat areas (ESHAs), eelgrass (*Zostera marina*), osprey (*Pandion haliaetus*) nests, and fish and marine mammal species. The Project will also address the conversion of intertidal to subtidal habitat and increased benthic cover.

Construction is anticipated to be completed in three phases. Phase 0 will first develop the improvements to the North and West access roads, as well as construct a new utility corridor, a new solar array, and the on-site habitat restoration areas. Phase 0 will also include demolition of the existing materials within the terminal area. Phase 1 will consist of development of the majority of the terminal area (150 acres) and all wet storage areas. This phase will include all dredging, construction of the northern wharf, partial construction of the southern wharf, and development of buildings and infrastructure on the upland subarea. Phase 2 will include developing the remaining 30-acre portion of the terminal and expanding the southern wharf.

1.2 Project Background

The State of California (State) has established goals of deploying 5 gigawatts (GW) of offshore wind energy by 2030 and 25 GW by 2045. Studies by the Federal Bureau of Ocean Energy Management (BOEM), the National Renewable Energy Laboratory (NREL), and the California Energy Commission (CEC) have indicated that major port development will be required throughout California for offshore wind energy goals to be realized.

BOEM has leased offshore wind sites near Morro Bay, California, and Humboldt Bay to private offshore wind energy (OSW) developers. The Harbor District is designing the Project to support OSW development for these leases and potentially other future leases where OSW will be developed on the U.S. West Coast. As necessary, the development and operations of offshore wind farms are expected to be analyzed in a separate California Environmental Quality Act (CEQA) document prepared by the California State Lands Commission and a National Environmental Policy Act (NEPA) document prepared by BOEM. Offshore wind farms and associated energy transmission are not included in the Project.

Unlike the U.S. East Coast, where fixed foundations are used for turbine installations, the West Coast ocean floor is much deeper, and floating foundations are necessary. It is anticipated that turbines installed off California's coast will have a capacity of 15 megawatts (MW) or greater. For the purposes of this analysis, 20 MW turbines were assumed for terminal design. Components for a 15+ MW turbine are so large that the only feasible way to transport them from one location to another is by waterborne transit. Road and rail transit will not be feasible. Therefore, port infrastructure is an essential part of achieving the OSW goals. In addition, assembly in open water is not practical; therefore, floating foundations, towers, nacelles, and blades must be assembled within ports and the fully assembled WTG is towed to the offshore wind site.

The terminal will serve primarily as a facility for the staging and integrating of the WTG components and may also be used to manufacture concrete foundations. The marine infrastructure and upland improvements are required to prepare the terminal for use by OSW developers. Although the OSW industry is the proposed anchor tenant of the modernized port facilities, in the future, the multipurpose facilities could accommodate other uses. The specific OSW developer(s) are not yet identified, nor are the contractors that may be selected to develop the site on behalf of the OSW developer(s). The Project described in this environmental impact report (EIR) is based on current industry knowledge of port operations and OSW industry needs.

1.3 Project Objectives

The objectives of the Project are as outlined below.

- Redevelop and repurpose a blighted and largely unutilized industrial site that formerly operated for decades as a major regional employment center.
- Create a diversity of new jobs and stimulate regional economic development.
- Develop a project that establishes Humboldt Bay as a global leader in addressing climate change and energy decarbonization by serving a critical role in offshore wind-related renewable energy development.
- Develop a facility that can contribute to the State goals of deploying 5 GW of offshore wind energy by 2030 and 25 GW of offshore wind energy by 2045.
- Provide the facilities and infrastructure required for Humboldt Bay to serve as the first floating offshore wind staging and integration port in California.
- Design and construct the site in such a way that it can serve multiple purposes, either simultaneously with the OSW functions or after.
- Develop a marine terminal site with modern environmental standards related to minimization of greenhouse gas emissions, on-site renewable energy generation, green building materials, the electrification of terminal operations, dark-sky design features, and the facilities needed to accommodate vessel shore power.
- Prepare the site for sea-level rise.
- Address and manage residual soil contamination if encountered at the site.

- Generate revenue that can be used for general Harbor District purposes throughout the rest of Humboldt Bay, including year-round maintenance of channel and marina depths, conservation, ecological restoration, and recreation programs.

1.4 Project Location and Setting

1.4.1 Project Location

The Project area is located on the Samoa Peninsula along Humboldt Bay, with the wet storage area located in the Bay east and southeast of the terminal area. Some minor Project components are located approximately 1.25 miles from the terminal on Woodley Island in Humboldt Bay (**Figure 1**). In addition, it is anticipated that there will be one or more offsite mitigation areas within the vicinity of Humboldt Bay. Humboldt Bay, which is California's second-largest bay, is in Humboldt County, about 270 miles north of San Francisco and 100 miles south of the Oregon border. Humboldt Bay is 14 miles long and 4.5 miles wide at its broadest point, with a 48-foot-deep entrance and federal navigation channels between 26 and 48 feet deep.

The Samoa Peninsula is an approximately 8.2-mile-long sand spit separating Humboldt Bay and the Pacific Ocean. The peninsula hosts an assortment of coastal habitats, including beaches and dunes, coastal coniferous and deciduous forests, and freshwater and brackish wetlands. The eastern edge of the peninsula contains mud flats, eelgrass, and salt marshes. Multiple residential communities are located on the Samoa Peninsula including Fairhaven, Finnetown, Town of Samoa, and Manila.

The Port of Humboldt Bay is accessible by air, sea, and road, with U.S. Route 101 being the region's primary coastal transportation corridor, along with State Route (SR) 299, a transportation corridor that provides the Port of Humboldt Bay with direct access to Interstate 5 and the rest of the nation's federal surface and maritime transportation networks. Locally, the Samoa Peninsula is served by SR 255 and New Navy Base Road, a county road.

Shipping, commercial and recreational fisheries, boating, and oyster mariculture are important parts of the economy and culture in Humboldt Bay. Petroleum and forest wood products are the primary types of cargo arriving (petroleum) or leaving (forest wood products) the Port of Humboldt Bay.

1.4.2 Project Site and Environs

1.4.2.1 Project Site and Existing Conditions

The terrestrial portion of the onsite area covers approximately 227 acres situated in a developed industrial area of the Samoa Peninsula where timber processing, pulp mills, and other timber-related industrial operations historically occurred. A site plan showing the location of former operations and structures is provided in **Figure 3**. Louisiana-Pacific (LP) historically occupied the site as part of LP Kraft Pulp and Lumber Mill operations. Much of the large-scale industrial activity occurred between the period of 1920 to 2005, with current site operations limited to log storage and fishing-related activities including the storage of commercial fishing equipment, commercial fish landing and holding, limited forest product storage, and mariculture. Much of the site is currently vacant. There are remnants from past forest product industry uses at the site, including utilities, buildings, docks, and other structures. This infrastructure is generally failing and in need of repair,

replacement, or demolition. Existing railroad tracks, coastal riprap, roadways, asphalt work areas, industrial stormwater management infrastructure, and degraded industrial foundations, buildings, and structures/equipment cover the majority of the site; however, portions of the site are densely covered in shrub, bramble, or young tree growth, reflecting the time that has elapsed since the site was last used for industrial purposes.

1.4.2.2 Areas of Potential Concern

Properties within or adjacent to the terminal area have been identified as areas of potential concern, which are sites with known or suspected releases of hazardous substances. Four categories of sites of potential concern were identified for the terminal, as follows: (1) known unremediated cleanup sites, which are sites that occur within the terminal and have known, existing soil and/or groundwater contamination; (2) suspect sites, which are sites within the terminal site that are associated with current and former uses historically known to use, store, handle, and/or generate hazardous materials and have the potential to have resulted in soil and/or groundwater contamination; (3) remediated sites, which are sites within the terminal where documented remedial activities have occurred and may or may not have received closure from the Regional Water Quality Control Board (RWQCB); and (4) off-site sites, which are sites within the vicinity of the terminal with known contamination that may have migrated on to the terminal site or could migrate, onto the terminal site (**Figure 3**).

One known unremediated cleanup site, 9 suspect sites/areas, and 3 remediated sites have been identified within the terminal site; 4 off-site sites have been identified within the vicinity of the Project site (**Figure 3**). It should be noted that the one known unremediated cleanup site, identified as #14 in **Figure 3**, the Simpson Timber Company Samoa Site (GeoTracker ID: T0602393498 with a status of *Assessment & Interim Remedial Action*), is a cleanup site located at 930 Vance Avenue; it is not shown as located within the boundaries of the terminal. However, preliminary investigations indicate that a portion of the cleanup actions associated with a former refuse burner. On-terminal remediation activities include the 1999 removal of a 1,000 gallon leaking underground storage tank (LUST). The LUST file was closed by the Humboldt County Department of Health and Human Services (in coordination with the RWQCB) on 11 February 2003 based on excavation of contaminated soil and subsequent groundwater monitoring.

Known releases of hazardous substances have occurred at the site but have undergone investigation and cleanup under the oversight of the North Coast RWQCB. Areas previously investigated for release and cleanup include fuel storage facilities and areas where wood has been treated with a fungicide application (**Figure 3**). The primary constituents of concern in these areas are petroleum hydrocarbons and their associated constituents (e.g., diesel, motor oil, gasoline, benzene, polycyclic aromatic hydrocarbons (PAHs), and pentachlorophenol (PCP)). There are currently no active cases under regulatory oversight requiring investigation and cleanup at the Terminal.

Additional areas of the site with the potential for contaminants include the former refuse burners in the northern portion of the site (dioxin/furans, PCP, and PAHs), former structures with industrial uses (fuels and lubricants), and existing structures that may contain asbestos and lead-based paint. General areas of lesser concern include areas where dredged material was used as fill on the site; utility/conveyance lines, which may act as a preferential pathway for released materials; and soils with potentially elevated levels of metal where materials from salvage operations may have been stored.

The U.S. Environmental Protection Agency (EPA) is currently implementing several Phase I Environmental Site Assessments (ESA), of which several will be followed by a Phase II assessment. It is anticipated that the Phase 1 ESAs will be published before the end of 2026. The objective of the Phase II ESA will be to assess any potential localized areas of contaminants prior to site development. Cleanup, as required, will follow.²

1.4.2.3 Project Site Land Use Designations

All of the Project areas are located in the California Coastal Zone, which is within the jurisdiction of the County of Humboldt and the California Coastal Commission (CCC). The Project is subject to the Humboldt Bay Area Plan (HBAP), a component of the Humboldt County Local Coastal Program (LCP). For the south western portion of the terminal area, the County of Humboldt is typically responsible for implementing the LCP and issuing Coastal Development Permits. In contrast, the eastern portion of the terminal area, along Humboldt Bay, is within the retained jurisdiction of the CCC (**Figure 4**). The CCC and County of Humboldt have agreed to the Harbor District's request for a consolidated Coastal Development Permit (CDP) application to be processed by the CCC.

The onsite Project locations have five Humboldt County land use designations: Industrial (MC and MG), Natural Resource (NR), Commercial (CR), and Public Facility (PF). The majority of the onsite project area is within the combining zone of Industrial, Coastal Dependent (MC/A) (**Figure 5a**). Zone "A" refers to an Archaeological Resource Area Outside Shelter Cove combining zone overlay that designates the Project site as within an area potentially containing archaeological resources. It provides "reasonable mitigation measures where development would have an adverse impact upon archaeological and paleontological resources" (Humboldt County 2017). A Port Development Overlay Zone request is part of the Project in order to rectify some zoning issues (Section 2.13).

Additional zoning designations in areas along the western periphery of the Project site include MG (Industrial General), NR/W (Natural Resources/Coastal Wetland Areas), NR/W,B (Natural Resources/Coastal Wetland Areas/Beach and Dune Areas), and PF/D (Public Facility/Design Review). The portion of the Project within the bay is zoned NR/W; however, there is an apparent mapping error where an NR/W-zoned parcel extends onto developed uplands (**Figure 5a**). The offsite improvements on Woodley Island are within the City of Eureka and zoned PF-M (Public Facilities – Marina) (**Figure 5b**). The Project site includes parcels identified by Assessor Parcel Numbers (APNs) 401-031-014, -039, -040, -041, -054, -061, -067, -071, -072, -077, -078, -080, -082, -083; 401-111-005; 401-112-011, -013, -021, -024, -029, -030; 401-121-012; 401-322-010; 401-323-001, -003; 401-345-002, -006, -007; and 405-03-110.

1.4.2.4 Existing Tenants

There are existing tenants within the Project areas that will be relocated as part of the proposed Project. The existing tenants' uses include shellfish and seaweed mariculture, commercial fishing equipment storage, and hagfish (*Eptatretus stouti*) landing/live holding. (**Figure 6**).

² State Water Resources Control Board. 2026. *GeoTracker—Simpson Timber Company Samoa (T0602393498)*. Available: https://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0602393498.

1.4.2.5 Neighboring Land Uses

To the south of the terminal area is Redwood Marine Terminal II, the historic site of the Samoa Pulp Mill (constructed in 1965) and the current site of an in-bay oyster and clam nursery, along with various upland tenants. To the north and west of the terminal area is the unincorporated community of Samoa, which includes planned and existing residential development led by the Danco group and other urban uses. To the east is Humboldt Bay (**Figure 1**).

1.5 Project Components

The Project includes both upland and marine components as part of redevelopment of the Project site into a multipurpose, heavy-lift marine terminal facility.

1.5.1 Overview of Operations

1.5.1.1 Permitted Operations

The proposed 180-acre terminal, consisting of two Staging & Integration (S&I) sites and one Floating Foundation Assembly site, is expected to be used for the installation of future OSW projects in the designated Humboldt Wind Energy Area and future lease areas within Northern California and the Pacific Northwest. These future OSW projects are expected to be 1.5 GW to 2 GW each and use turbines rated to 20 MW, but the details regarding those projects are still under development. As noted, future OSW projects are not a part of the Proposed Project. The Proposed Project will serve as the marshalling port for the installation of OSW projects along the coast of Northern California and Oregon.

This description of proposed permitted operations at the terminal and wet storage areas is to inform the reader about expected port operations and define the equipment and component types that are anticipated. More detailed description of operations is found in the following sections.

Explanations of port operations are based on current industry knowledge; actual Project dimensions (e.g., anticipated wind farm size, turbine rating, foundation type) and port operations ultimately are decided on a project-to-project basis by the OSW developer and may differ from the general explanation provided here. The primary factor behind port criteria is the size of the WTG components and floating foundations. The size of these uniquely large components dictates the required upland acreage and bearing capacity for both the uplands and wharfs. Component size also influences the delivery vessels that will use the facility and foundation designs, driving the design criteria for navigational depth and berth/wharf lengths.

The terminal area is expected to be the location of final assembly for the OSW foundations and the location for the staging and full assembly (i.e., integration) of the WTG components (**Figure 7**). These two operations are the final onshore activities prior to tow-out and offshore installation of the fully assembled floating offshore wind (FLOW) turbine. In general, the two operations are defined as follows:

1. **S&I Site:** A site that will receive, stage, and store WTG components and be used to integrate the WTG onto the floating foundation before final tow-out to the OSW Project areas. Heavy

equipment such as ring cranes and crawler cranes are expected to be used during the S&I processes.

2. **Floating Foundation Assembly Site:** A site that will receive, stage, and store floating foundation subcomponents (e.g., columns, struts), assemble/produce the floating foundation systems, and transfer the assembled foundations from land to water for integration of the WTG components at the S&I site. Both concrete-based and steel-based foundation designs are expected to be accommodated by the Project.

An important operational consideration is that the onsite foundation assembly can support only one of the S&I sites with the proposed amount of space and assembly lines. As a result, the simultaneous operation of both S&I sites will require the other S&I site to import all the floating foundations needed for full assembly. For the Project, it is expected that additional foundations will be imported from another port on the West Coast, such as the proposed Pier 94/96 OSW Foundation Assembly Port in San Francisco.

Each S&I site contains up to 50 acres of landside space and will have access to the north and south heavy-lift wharf (1,700-foot and 1,800-foot) for the berthing of delivery vessels, WTG assembly, and WTG precommissioning.

In addition to the two S&I sites, a floating foundation assembly site is included in the remaining 80-to-100 acres depending on developer configuration of the terminal (**Figure 7**). This will provide significant economic benefits and create jobs as well as operational efficiencies. The floating foundation assembly site will have 600 feet of dedicated wharf frontage along the 1,800-foot South heavy-lift wharf for foundation launching and also access to a berth for delivery of subcomponents.

These Project components are described in detail in this section and shown in **Figure 7**. As described in Chapter 1, *Introduction*, the Harbor District is proposing to approve and implement specific activities (e.g., structure demolition, construction, and Project operations) related to OSW development. This EIR evaluates these specific activities at a project level.

1.5.1.2 Concrete Batch Plant and Material Storage

A concrete batch plant, if used, would be located on the upland portion of the terminal to support floating foundation assembly. It would be used to manufacture concrete from its raw materials, including cement, aggregates (stone and sand), water, and admixture chemicals depending on foundation design as both concrete and steel foundations are proposed. Concrete mixtures are based on engineering specifications. Concrete mixture specifications vary by altering the proportion of various raw materials. The batch plant is expected to be located at the southern end of the site, within the Floating Foundation Assembly Site (**Figure 8**). This area prioritizes being away from the residential areas on the northern end of the terminal site. The batch plant is expected to be approximately 2 acres in size, with the majority of the area being used for aggregate storage.

Up to two mobile concrete mixing plants and stockpile areas for aggregate and mixing materials will be located within the designated batch plant area (**Figure 8**). The batch plant is expected to produce between 60 and 120 cubic yards (yd³) of concrete foundations per hour during the operations phase. Daily operational hours at the batch plant will follow the general port schedule, which may operate up to 24 hours a day. However, most activities would likely occur within an 8-16 hour window. Water provided by the Humboldt Bay Municipality Water District (HBMWD) will also be used for batch plant operations.

Additional equipment for the batch plant will include approximately two front loaders, approximately three to six concrete mixing trucks, and approximately three to six dump trucks to transport aggregate material from the quay to the batch plant aggregate storage areas.

1.5.1.3 Operational Staffing

Workforce numbers are based on industry outreach and prior OSW knowledge from Moffatt & Nichol. Foundation production and assembly is assumed to require approximately 300 to 350 workers, with concrete foundation production expected to require more workers than a steel foundation design. S&I operations will, on average, require 150 workers. In total, approximately 650 employees are expected to operate concurrently on site between all expected OSW operations.

1.5.1.4 Future Operations

Other projects may occur at the terminal in the future but are not yet designed or proposed to be constructed or operated. Because details regarding these future projects are not available to facilitate impact analysis and no approvals will be provided for these future projects at this time, any discussion of the effects of these future projects would be speculative. Therefore, this EIR does not evaluate the potential physical changes to the environment associated with these future projects.

1.5.2 Proposed Uses and Operations in Upland Development Subareas at the Terminal

Four subareas are delineated within the onsite area, according to the type of construction and operational activity that will occur within them (**Figure 2a and 2b**). Onsite, these include the Upland Development Subarea, the Marine Development Subarea, the Wet Storage Subarea, and the Habitat Mitigation Subarea (**Figure 2a**). Additional Project features that are outside of the Upland Development Subareas on Woodley Island are referred to as Offsite Improvements (**Figure 2b**).

1.5.2.1 Upland Development Subarea

The Upland Development Subarea is landward (west) of Humboldt Bay. All nonmarine development in support of the terminal operations will occur in this area (**Figure 2a**).

Tenant Relocation

Commercial Fishermen Dock and Storage Area

Commercial fishermen currently store equipment within the Upland Development Subarea (**Figure 6**). Existing commercial fishing storage will be relocated to Woodley Island (**Figure 9**). This area on Woodley Island will be graveled and fenced. In addition, the Woodley Island Marina work dock (**Figure 9**) will be expanded to accommodate the increased need for moving equipment between the new storage area and vessels.

Hagfish Landing and Holding Facility

A permitted facility that unloads hagfish from a fishing vessel and temporarily holds them prior to shipping is located within the Upland Development Subarea (**Figure 6**). The facility includes a bay-water intake and discharge. This facility will be relocated to an off-site location that has not yet been

identified, and any such analysis would be speculative. Relocation of the facility is not part of the proposed Project, as such it will be reviewed and permitted under a separate process.

Initial Operations

The Project is expected to have two separate S&I terminals at the port. Initial operations will include preparing the terminals for receiving WTG components (**Figure 7**). The description of operations that follows applies to each of the two S&I sites individually. Each S&I site may support separate projects and have different project schedules.

The contracted operator at each terminal will first be tasked with assembling three to five crawler cranes and one quayside ring crane.³ The crawler cranes will be used for WTG component unloading, component storage, and moving components in the pre-integration area. The ring crane will be responsible for the integration of the WTG components with the floating foundation and set up at the integration berth. The developer, in conjunction with the port operator, will set up temporary warehousing and office locations on the terminal. Self-Propelled Modular Transporters (SPMTs) will also be delivered to the port and have dedicated storage locations when not in use.

Wind Turbine Generator Components Delivery and Storage

Crawler cranes positioned at the dedicated delivery berth will be used to unload WTG components from the vessels, with SPMTs used for the transport of the unloaded components from the delivery berth to the upland staging areas. Due to different original equipment manufacturer (OEM) designs and developer strategies, it is anticipated that WTG blades will either be stacked two to three high when stored or stored in a single layer. Crawler cranes in the uplands will assist in the storage of blades and other WTG components.

Before the integration process begins, a full set of WTG components (i.e., one nacelle, three blades, and three to four tower sections) will be transported from the upland staging areas to the pre-integration area located adjacent to the ring crane setup at the integration berth. This pre-integration area serves as the final staging area for the WTG components and will be where each component will be prepped for integration onto the floating foundation. The various WTG components will be delivered to the port by vessel. The size and weight of the WTG components are provided in **Table 1**.

Table 1. Anticipated WTG Component Dimensions

WTG Component	Approximate Length (feet)	Approximate Width (feet)	Approximate Height (feet)	Weight (tons)
Blades (3)	300 to 450	15 to 25	15 to 25	120 to 200
Nacelles (1)	75 to 100	35 to 50	35 to 50	1,000 to 1,500
Tower Section (3-4)	100 to 130	25 to 40	25 to 40	250 to 400

³ Anticipated design is similar to that of a SK6000 ring crane. Approximate height of the boom tip will be 800 feet to accommodate a working point of approximately 600 feet while assembling large WTGs. The expected dimension of the crane footprint is between 300 and 450 feet.

Floating Foundations

Delivery and Storage

Subcomponent delivery is anticipated to begin between 1 and 2 months before the beginning of the foundation assembly stage to supply the terminal with a surplus of foundation subcomponents to use in case of unforeseen delays in the component delivery schedule. This buffer minimizes the risk that the foundation assembly process will become a bottleneck for the entire Project. Based on previous investigations and through discussions with developers, 20 percent of the total required Project components should be stored on-site at any given time for the duration of the foundation assembly phase. The size and weight of the floating foundation components are provided in **Table 2**.

Both concrete and steel foundations are expected to be of a similar size and made up from the same major component types, these being columns and struts. It is anticipated that any chosen semi-submersible foundation design will consist of three or four columns, which will be connected by struts. The components can be made of steel, concrete, or a combination of both.

Table 2. Anticipated Floating Foundation Component Dimensions

Foundation Component	Approximate Length (feet)	Approximate Width (feet)	Approximate Height (feet)	Weight (tons)
Struts	300 to 450	10 to 15	10 to 15	500 to 1,000
Columns	30 to 60	30 to 60	75 to 100	750 to 2,000

Steel Foundations

For steel foundations, a semi-submersible delivery vessel arrives at the dedicated delivery berth at the foundation assembly terminal carrying struts and columns for two or three full foundation sets. One crawler crane will work in tandem with SPMTs to unload components. Foundation components will be transported by SPMTs to the dedicated storage location in the uplands of the foundation assembly terminal. The crawler crane will be permanently stationed at the delivery berth to assist in unloading activities. Once unloaded (expected to take 24 to 36 hours), the delivery vessel will leave port and return to the OEM facility. Depending on operator schedule and OEM distance, more than one delivery vessel will be used for foundation subcomponent delivery. No additional on-site steel production is required because subcomponents will be delivered to the foundation assembly terminal by delivery vessel.

Concrete Foundations

For concrete foundations, barges would be responsible for the delivery of raw materials and reinforcing steel for concrete production to the port. Concrete foundation production requires a dedicated area for the delivery of raw aggregate and concrete batching. The coarse and fine aggregates and cement delivered by barge would be unloaded by crawler crane and transported from the quayside to the batch plant by dump trucks. Admixtures and other concrete additives would be transported by truck to the port. It is anticipated that up to three barge deliveries and 20 truck deliveries per week will be required during concrete foundation production. Water lines connected to public utility infrastructure would bring water needed for concrete production to the port. Concrete foundations are expected to be built in a manner similar to that used for steel

foundations, using an assembly line–style production sequence and both cast-in-place and pre-cast sections.

Foundation Assembly

Foundation assembly is expected to be completed in an assembly line style with three or four assembly stages. Each stage is expected, on average, to be completed in a week, leading to a fully mature production line to output one foundation every week. Each assembly stage will have a dedicated crawler crane to assist in assembly.

Transport of the foundation between stages will be completed with SPMTs or a temporary dedicated rail system. Ultimately, the choice will come from the developer. If a rail system is chosen, this will be constructed during the OSW operator mobilization stage. Once complete, the foundation will be moved to the loadout berth and prepared for loadout onto the semi-submersible barge.

Although the assembly activities differ between steel and concrete foundation designs, both foundation types are assumed to follow the same transport offloading sequence once assembly is complete.

Steel Foundations Assembly

For steel foundations, the assembly process comprises combining the prefabricated foundation components that have been delivered to the port. Steel semi-submersible foundation designs are anticipated to comprise three columns with connecting struts between each column. Bolting and welding operations are expected to be done during this assembly process. The assembly process is expected to be completed in an assembly line style with three or four assembly stages. The final assembly stage will include a final inspection of the foundation and potential minor paint touch-ups, although the prefabricated components are expected to come pre-finished.

Concrete Foundations Production

Concrete foundations are expected to also be produced in an assembly-line style. The production of concrete foundation is anticipated to use both cast-in-place and pre-cast components, with precasting happening in temporary warehousing on-site. The additional equipment required for concrete foundation operations is listed below.

- Mobile batch plant(s)
- Aggregate storage locations
- Front loaders
- Concrete trucks
- Dump trucks
- Warehousing area for pre-casting

Foundation Loadout and Sinking Basin Operations

Once a foundation has been loaded onto the purpose-built semi-submersible barge, the barge, with assistance from two or three harbor tugs, will be transported to the dedicated sinking basin. Once transported to the sinking basin, the semi-submersible barge will de-ballast to allow the foundation

to begin floating. This operation is expected to take between 4 and 8 hours. Two harbor tugs will either transport the floating foundation directly to the integration berth at the S&I terminal or to wet storage if the integration berth is in use. The semi-submersible barge will ballast and then be returned to the loadout berth under assistance from harbor tugs. The foundation loadout operation is not expected to be a bottleneck to production because the duration to assemble a foundation (7 to 10 days) is expected to be significantly longer than the total float-out operation (8 to 16 hours). The semi-submersible barge will be dedicated to the operations and would not leave Humboldt Bay, strictly operating between the loadout berth and the sinking basin.

WTG Assembly

The WTG assembly process begins with the arrival of a completed floating foundation to the dedicated assembly berth, whether assembled on-site at the adjacent foundation assembly terminal or supplied from an external assembly port. With the necessary WTG components already in the pre-assembly area, the ring crane will lift components and transfer them onto the floating foundation where workers will complete the assembly and installation process. The order of installation of the WTG components is as follows: tower sections, nacelle, blades. Full assembly of the WTG components is expected to take between 3 and 5 days. The size and weight of the fully assembled WTGs are provided in **Table 3**.

Table 3. Anticipated WTG Dimensions

WTG Size	Approximate Blade Diameter (feet)	Approximate Height to Nacelle (feet)	Approximate Highest Elevation to Tip of Blade During Rotation (feet)
15 MW	300 to 400	Up to 550	950
20 MW	350 to 450	Up to 600	1,050

Landfill Solar Array

To supplement energy use at the terminal, the Project will include a large off-terminal, ground-mounted solar photovoltaic (PV) system on the nearby Harbor District-owned LP Samoa solid waste landfill (**Figure 7**). The total landfill area is approximately 30 acres, with three capped waste management units (WMUs) covering 15 acres. The WMUs are 30- to 35-foot-high capped mounds containing approximately 98 percent wood ash from a former pulp mill. The ash material stored in the landfill mounds is protected from rainwater inundation by a cap consisting of a 1 foot impermeable clay “barrier layer” made up of dredge material, which is covered by 2 feet of sand “vegetative layer”, and 6 inches of mulch. The final cap surface is sloped no steeper than 3H:1V on the sides and no flatter than 3 percent on top.

To avoid potential damage to the WMUs side slopes during construction, the solar arrays will only be located on three of the WMUs that are gently sloped at a maximum 5 percent grade, resulting in an approximately 800 kW combined solar PV system. The existing landfill caps will be enhanced by removing the top 2 feet of the existing cover material and replacing it with geomat and a light weight cellular concrete (LCC) layer such that there is a net zero weight addition to the mounds from the solar array, and to extend the expected useful life of the caps. A ballasted PV support structure and racking system will be installed on top of the new WMU caps to hold the PV system in place. The PV arrays will be combined at a central location at the base of the mounds utilizing standard 480V

switchgear service equipment, a main and feeder circuit breakers, and Pacific Gas and Electric (PG&E) metering, as well as control power and backup battery system to support safe and reliable interconnection. The system will be connected to the nearest PG&E 12 kV overhead distribution line located southeast of the landfill area through a utility owned pad mounted 12 kV step-up transformer and new service extension.

Class I Bike Path Trail within the GRTA Right-of-Way

As part of the Project, a new Class I bike path trail within the Great Redwood Trail Agency (GRTA) corridor will be provided, extending approximately 1.2 mile along the western length of the proposed marine terminal (**Figure 10**). The trail design follows design guidance provided in the Great Redwood Trail Master Plan and will consist of two 5-foot paved lanes with two 2-foot aggregate base shoulders, a striped and signed intersection where the trail crosses existing roadways, two community access points, and two community trailheads. The total footprint of the bike path trail will therefore be approximately 2 acres, although disturbance, signage, and native plantings may expand that footprint, with construction and railway relocation potentially reaching 3-to-4 acres. Striping and signage at the intersections will vary, based on the anticipated vehicular traffic, but, at a minimum, will include trail crossing signage, ladder crosswalk striping, and detectable warning surfaces on either side of the crosswalk. An additional crosswalk will be included across Vance Avenue to provide trail access to Peninsula Union School. One community access point be located at Vance Avenue and the Recology Humboldt County facility; another will be located just north of the Phyllis Rex Townhomes. One community trailhead will be located across from the Samoa United States Postal Service office; another will be located just south of the Timber Heritage Association driveway. Just north of the post office community trailhead, the existing railroad will be rehabilitated or moved to allow the Timber Heritage Association to continue to use it for small passenger railcars. In these locations, the trail will be located along the western edge of the GRTA right-of-way and the railroad will be relocated to the western edge of the right-of-way and include separation between the trail and the railroad, which will sit on a fill prism at an elevation higher than the trail.

Access Road Improvements

There will be two access points to the terminal site during construction and operation, the North and West Access Roads (2.6.4, *Operational Terminal Access*) (**Figure 11**). The North Access Road will accommodate a combination of worker vehicles and standard highway trucks for deliveries. Large overlength lowboy-type trucks are not anticipated to utilize the North Access Road. The West Access Road will accommodate a combination of worker vehicles, standard highway trucks, and heavy haul overlength lowboy type trucks for delivery of equipment.

Roadway improvements include modifications to LP Drive and Vance Avenue for the West Access Road, and Cookhouse Road, and Vance Avenue between Cookhouse Road for the North Access Road. These roads and intersections will be widened where necessary to accommodate the travel and turning radii of semi-trucks and other large equipment haulers that require access to the terminal site during construction and operations. These existing roads will also be rehabilitated with new pavement and shoulder material where deemed necessary to accommodate traffic loading and longevity of the public roads to be used for site access. In addition, signage and striping will be added at all impacted intersections to accommodate traffic entering and exiting the community of Samoa (**Figure 12**). This signage and striping includes stop striping at LP Drive and New Navy Base

Road, a stop sign and striping at LP Drive and Vance Avenue, stop striping at the intersection of Cookhouse Road and New Navy base Road and exit of the Timber Heritage Association driveway, stop striping on the eastbound lane of Vance Avenue where it meets Cookhouse Road.

1.5.2.2 Marine Development Subarea

The Marine Development Subarea extends from the top of the bank and into the bay to the federal navigation channel. Assembly and load-out of the floating foundations will occur in this area, as will the final vertical integration of the various offshore wind components into deployment-ready, fully constructed floating WTGs. Most of the marine development will occur in this area, except for foundation float-off and off-terminal wet storage that will occur in the Wet Storage Subarea (**Figure 2a**).

Wet Storage

Following the WTG assembly is the cold-commissioning phase. This phase consists of finalizing the interior mechanical and electrical system within the turbine and conducting final assembly tests of the turbine unit without allowing it to generate electricity. To complete the testing, a connection to the port's electrical grid or a mobile generator will be required. The duration of the cold-commissioning phase is anticipated to be between 1 and 3 days. Depending on developer strategy and port berth resourcing, the cold-commissioning process will either take place at the integration berth or adjacent wharf area. Depending on the OEM's procedures and available wind conditions, these tests may include assessing pitch and yaw; hydraulics, lubrication, and cooling; HCVAC and pumps; brakes and rotor lock; emergency stops and safety chains; and alarms, sensors, and communications.

The rotor will generally be stationary/locked for much of this work. Some procedures may include mechanically driven or controlled slow rotation. If the rotor is rotated it will not exceed 1 revolutions per minute (RPM; ~30 mph at the tip of a 140m long blade) for a maximum duration of 1 hour. At most, they would complete one rotation between 90 – 360 degrees at any given time within Humboldt Bay as there will not be enough power for higher speed or additional rotation. This would be the extent of turbine rotation at the Project site.

Wet storage areas used for short-term temporary mooring (staging) of floating foundations and fully assembled turbines (referred to as wet storage sites) will be developed. Wet storage is used for the temporary mooring of either floating foundations (without turbines affixed) or fully assembled WTGs on the floating foundation units as the units await the next step. Wet storage of floating foundations serves as additional inventory in the event of foundation assembly delays, ensuring uninterrupted operations for the integration process. They also allow for production of fully assembled turbines to continue until an adequate towing weather window is available.

Once fully assembled WTGs finish cold-commissioning and are certified for completeness, they are ready to be installed at an offshore wind farm location. Ideally, fully assembled WTGs are towed directly from the integration or wet storage out of Humboldt Bay, but due to various reasons, such as assembly delays or weather holds, the fully assembled turbines would instead be moved to one of the wet storage locations to allow assembly of the next WTG to continue.

While in wet storage and during tow out, the WTGs are required to be connected to a mobile generator to continue to power the WTG to prevent degradation of the bearings within the rotor

assembly. This is because the subtle rocking motion while the WTG is afloat would cause internal bearings to vibrate against each other in the same location and lead to a process called false brinelling – a form of structural wear and indentation that can ruin the bearings before the turbine ever generates power. To prevent this, the mobile generator is used to periodically drive the rotor at very low speeds (**Table AI**) to redistribute the grease and shift the contact points on the bearings.

Transport of the fully assembled WTG, both between the port and wet storage, is to be conducted by one anchor-handling tug vessel and two to three harbor/ocean tugs working in tandem. Assembled turbines are expected to be in the wet storage holding area from a few days to several weeks, depending on developer scheduling and weather impacts, and to be in use all year. All will be dredged to a minimum depth of -38 feet (ft) mean lower low water (MLLW).

Two wet storage areas have been identified, as necessary, to service the two S&I sites: (1) Floating Foundation Wet Storage-North, and (2) Floating Foundation and Fully Assembled Turbine Wet Storage-South (**Figure 7**).

The north wet storage area will be approximately 45 acres and located at the northern end of the Project site closest to the State Route 255 bridge. The north area will be used to accommodate up to two floating foundations and includes dredging for the sinking basin (see discussion below). Due to proximity to the bridge, the northern area can be used for wet storage of foundations only, not fully assembled WTGs. .

The south wet storage area will be approximately 71 acres east of the South Wharf and near Tuluwat Island. This area will be used for the temporary mooring of up to seven floating foundations and/or fully assembled WTGs during operation of the two S&I sites.

Sinking Basin

Numerous technologies have been proposed for the load-out of assembled foundations from the land-side to the water-side, and the chosen technology may vary among projects based on foundation design and developer preferences. However, industry outreach and extensive research indicated that the use of a semi-submersible barge may be the most common, practical, and flexible solution. Semi-submersible barges require a location deep enough, approximately 60 feet at minimum, to submerge and float off foundations, known as a sinking basin.

For the Project, a conceptual assessment of the project site adjacent to the Samoa Channel combined with expected dimensions of a 20 MW floating foundation and purpose-built semisubmersible barge, indicated that minimum sinking basin footprint of 500 ft by 600 ft is required to service the port. The sinking basin location was determined to be best located within the footprint of the Floating Foundation Wet Storage-North site due to proximity to the Project and wet storage areas (**Figure 7**).

Due to physical constraints of the Samoa Channel and Samoa Bridge, a larger sinking basin on the order of 900 ft by 650 ft (approximately 13.5 acres) required for float off operations of a semisubmersible delivery vessel is not feasible at the Project area. Since one of the two S&I sites will receive foundations from an external assembly via semisubmersible delivery vessels, float off operations are expected to be conducted outside of the Humboldt Bay Channel entrance. A combination of Anchor Handling Tug Vessels and Ocean Tugboats would then transport the floating

foundations through the Humboldt Bay Channel System to one of the S&I port sites at the terminal location.

Mooring and Berthing

Based on limited available space, a fixed mooring system will be utilized with mooring lines for maintaining position of the floating foundations or fixed mooring dolphins with catenary mooring lines. This will limit the travel of foundations when at anchorage. The north area will include both fixed breasting dolphin or a catenary mooring design. The south wet storage area will include both the fixed breasting dolphin and mooring dolphin hybrid design (**Figure 7**).

Ballasting

Ballasting operations are required to level and stabilize the floating foundations during offloading from the wharf to the water and during vertical assembly. Bay water will be used for ballasting, which can be done by flooding foundation compartments or using pumps. Foundation ballasting may be required in the following circumstances:

- WTG Vertical Integration: Flooding floating foundation compartments while tower sections, nacelle, and blades are installed.
- WTG Tow-Out Preparation: Flooding floating foundation compartments as preparation for tow-out of the fully assembled WTG.

Wet Storage Structure

Each wet storage slot supporting a floating foundation or fully assembled turbine will consist of two pile-supported platforms and a monopile. The pile-supported platforms will be approximately 40 feet wide by 200 feet long and supported by 48-inch-diameter steel pipe piles (**Table 4**). The monopile, which will be centered between the two platforms, will be approximately 60 inches in diameter and will support an approximately 15-foot by 15-foot concrete deck. 5 ft wide gangways (i.e., trestle) will be constructed between the platforms to provide access between them. The concrete platforms will be fitted with mooring bollards, super cones, and energy absorbing fenders, while the monopile be fitted with mooring bollards. **Table 3** provides a summary of the pile sizes and the number of piles that will be used for wet storage.

Table 4. Wet Storage Pile Information

Component	Width (feet)	Length (feet)	Depth of the Deck	Steel Pipe Pile Size (inches)	Number of Piles
Platforms	40	200	3	48 × 2	650
Monopiles	15	15	3	60 × 2	15

Mobile Generators on WTGs

Once a WTG is fully assembled, the nacelle, which houses the gearbox and control systems, requires a constant power source to keep the internal control systems functioning. Without this power source, internal components could be damaged from external movements of the blades turning and rotating the nacelle. While berthed at the integration/commissioning berth, it is expected that plug-in electrical power will be used to power the nacelle, both for testing operations and for powering

the control systems. For the south wet storage location, diesel-powered generators are expected to be used to power the nacelle control systems for the fully assembled turbines. These generators would be mobile generators that would be attached to the turbine foundations while they are moored at each wet storage slot. Generators would be in constant use while assembled turbines are moored. It is expected assembled turbines could spend between 3 days and several weeks at wet storage waiting for a tow-out opportunity, which is dependent on available tugs and periods of fair weather when tow-out operations can happen.

The power rating of each generator is expected to be up to 120 kilowatts (kW) (150 kilovolt-ampere [kVa]), with generator dimensions of around 10 × 4 × 6 feet (length, width, height). Diesel fuel capacity is anticipated to be between 90 and 120 gallons, with run times between 24 and 36 hours. Tug vessels would be used for refueling with diesel being sourced from nearby facilities or on bunkering barges. The mobile generators will be placed on the foundation before the assembled WTG departs the port and will be operational while in wet storage and until arrival at the offshore installation site. Once the assembled WTG is installed offshore, the mobile generators will be removed and returned to the port between use.

Tenant Relocation: Mariculture Operations

There are currently two shellfish farms and one seaweed farm within the Marine Development Subarea (**Figure 2a**). These farms are operated by private, non-profit, and academic entities with state, local, and federal regulatory approvals that are held by the Harbor District through a program known as the Humboldt Bay Mariculture Pre-Permitting Project. The shellfish and seaweed farms will be relocated to an area that has not yet been identified; the permitting and approval of those sites are not part of this Project as analysis of any such impacts would be speculative.

1.5.2.3 Habitat Restoration Subarea

In the approximately 9-acre Habitat Restoration Subarea, wetlands and environmentally sensitive habitat areas (ESHAs) will be created and restored to partially mitigate biological impacts in the Upland Development Subarea (**Figure 13**). In addition, structures suitable for osprey nest relocation will be included in the design.

Proposed Uses

The Habitat Restoration Subarea currently includes areas that are ruderal and dominated by nonnative invasive plant species. Habitat restoration, including estuarine and freshwater wetland establishment, will provide on-site mitigation for some of the Project impacts on wetlands and ESHAs and accommodate some relocated osprey nests (**Figure 13**). Habitat restoration will develop a mosaic of habitat types that are significantly higher in quality than those that will be affected by the Project's upland development. This is because wetlands within the Habitat Restoration Subarea have developed for a longer period of time due to earlier abandonment of activities in that subarea. However, the existing wetlands in the Upland Subarea are characterized by fill substrates and nonnative and invasive species in the understory; in many cases, they are artificially induced as a result of past industrial development. Estuarine wetlands along Humboldt Bay in the Habitat Restoration Subarea are high quality and able to support special-status salt marsh species and sensitive salt marsh habitat.

Based on the preliminary mitigation plan developed for the Habitat Restoration Subarea in 2024, nearly all of the remnant sensitive natural communities in the mitigation area will be avoided during the implementation of this plan; however, some minor impacts are unavoidable during the creation of new depressions and other restoration activities. Estuarine and freshwater channels will be excavated to meet design specifications for tidal influence and be adaptable to anticipated sea-level rise. Additional areas will be planted with a diverse palette of native plants, which will provide higher-quality habitat and improved ecological function through the removal of invasive species and industrial debris and the planting of native species.

1.5.3 Proposed Uses in Offsite Improvement Areas

1.5.3.1 Woodley Island Storage Area and Dock

The Woodley Island Marina Dock will be modified to support service for fishing vessels relocated as part of the Project (**Figure 9**). The expanded Woodley Island Marina Dock will include a landside, approximately 4-foot shallow founded retaining wall; and an extension to the existing dock structure (**Figure 9**). The expanded dock will result in a marginal wharf from the landside to the existing berth face, which will maximize the footprint to provide the largest marine structure. The expanded dock will also include a new 5-ton davit crane with a 20-foot reach, similar to the two stationary davit cranes on the existing dock. In addition, a landside storage yard (**Figure 9**), which includes a 50,000 SF gravel storage yard with a 15-foot by 100-foot carport, and 1,200 linear feet of perimeter chain-link fencing, will be included as part of the expansion.

1.5.3.2 Woodley Island Waterfront Recreation Center (Sailing Center)

The Project will include a waterfront recreation center, which will be located at the eastern end of the Harbor District's property on Woodley Island to improve community access to the bay (**Figure 14**). The proposed waterfront recreation center will include a combination of site improvements and open pavilions located on approximately 2 acres of developed land with existing lawn and paved surfaces (**Figure 2b**). The covered space will include an open pavilion and will be constructed on one level to optimize ground-level access and views of the bay. Maximum structure heights will be approximately 35 feet; the structure will be up to 10,000 square feet in size. Exterior lighting will be designed to allow safe access for users while minimizing distraction from site features and views of the bay. Low fixture placement and shielded fixtures will be incorporated to minimize visual disturbance and compliance with Dark Sky standards.

1.6 Terminal Facilities

1.6.1 Terminal Buildings

Proposed terminal buildings will include warehouse/shop and equipment storage buildings, and administrative and employee support buildings such as those shown in **Figure 7**. The Project will include the development of one permanent building on site that will consist of an administrative and employee support section up to 30,000 SF and warehousing space up to 60,000 SF. This proposed building will be located near the Southern Entrance and will include a dedicated parking lot for employees and visitors. Additional employee support locations consisting of trailers/conex boxes

are expected to be brought to each individual project site at the terminal. In addition to the permanent warehousing building, temporary warehousing buildings will be constructed on-site by each OSW project developer. It is expected that these temporary warehouses will be assembled from pre-fabricated sections and be standing for the duration of the project developer lease. Total warehousing square footage on-site is anticipated to be up to 220,000 SF with temporary warehousing consisting of up to 160,000 SF spread across several buildings. The exact style and orientation of the temporary warehousing buildings will be dependent on each individual project; however, **Figure 7** provides a reasonable layout and size of the buildings needed to support the operations.

1.6.1.1 Warehouse and Storage Building

Based on the requirement of existing offshore wind production facilities, warehouse and storage needs vary greatly, depending on the operator and phase of production. In order to maintain flexibility for terminal operations, it is anticipated that the permanent warehouse building will be supplemented by temporary warehouse buildings. Foundation assembly operations is expected to require the greatest amount of temporary warehousing space, up to 100,000 SF, with S&I operations anticipated to require up to 60,000 SF.

The temporary warehouses will most likely be one-story, long-span steel structures with metal-panel skins; with dimensions approximately 200 and 300 feet wide by 300 to 500 feet long and up to 50 feet in height. This type of warehouse structure is most frequently constructed of pre-fabricated components, which can be rapidly assembled on-site, thereby minimizing construction activity and associated off-site impacts such as the movement of materials and construction vehicles.

Conditioned storage spaces (i.e., space for electronic equipment or specialized parts) within the warehouse buildings will be constructed to meet applicable energy codes. It is anticipated that the warehouse and storage buildings will have minimal utility requirements. Spaces intended primarily for unconditioned storage will require electrical service for lighting and mechanical ventilation, while conditioned storage spaces will require electrical service for lighting and mechanical equipment.

1.6.1.2 Shop and Equipment Spaces

Shops and equipment spaces will be constructed as needed to support maintenance of outdoor assembly facilities and machinery. These spaces are expected to be housed within the warehouse structures. The shop spaces may be constructed of prefabricated metal, with smaller, separate structures constructed with conventional light-gauge metal or a wood frame; site built; or modular. It is anticipated that shop and equipment spaces will require three-phase power, water, and wastewater utilities. Natural gas will not be required.

1.6.1.3 Administrative and Employee Support Spaces

Management and administrative support office spaces, employee meeting rooms, and storage and locker facilities will be required for terminal employees. A central administration building will be constructed on-site to be the primary location for administrative and employee support. The administrative building may be one to three stories and approximately 100 to 150 feet wide by approximately 150 to 200 feet long. Construction of this building will include a concrete foundation and will be a steel-framed structure and will adhere to applicable building and zoning codes. The

building façade is expected to be brick or stone. Although not having the largest building footprint expected at the terminal, the administrative and employee support building will be the most visible to individuals outside of the terminal site. Exterior lighting of the public-facing facades of these spaces will utilize shielded fixtures to direct light within the building perimeter and limit off-site light pollution, as needed. Lighting controls will also be designed to reduce light levels to the minimum level necessary for required functions. Utilities required to support the administrative and employee support space will include electricity, telecommunications, water, and wastewater connections. It is not anticipated that natural gas will be required. In addition to the central administration building, it is expected that OSW developers will bring in additional employee support areas at each site on the terminal in the form of mobile trailers or conex boxes. The additional employee spacing is expected to have a footprint up to 10,000 SF at each site on the terminal and require access to the electrical utilities. Wastewater at these additional employee support areas is expected to be self-contained. Additionally, small guardhouses may be placed at entrances to the terminal site.

1.6.2 Terminal Site Lighting

The proposed lighting design consists of high-mast lighting (HML) poles strategically placed along the facility perimeter and along the limits of the terminal areas to provide appropriate illumination levels. HML poles will have a mounting height of 150 feet, with each containing four to six luminaires that will be individually aimed for precision light projection while directing light toward the interior of the terminal. The HML poles will provide complete coverage for operational and security requirements.

Port terminals require lighting systems that provide reliable, safe, and efficient illumination levels to support port operational activities, maintenance, and security requirements. Until recently, the primary focus of the design criteria for lighting systems for port terminals was the technical requirements (i.e., determining a light source, calculating illumination levels and uniformity ratios). Although light quality has been addressed within industry-recommended practice, the impacts on marine ecosystems and nearby communities have recently become a significant focus of port lighting design. Beginning in 2023, DarkSky developed specific guidelines for high-quality lighting design in port terminals. The goal was to develop guidelines that supported sustainable designs while minimizing the exposure and disruption of marine life and nearby communities due to artificial lighting. These guidelines were finalized and issued in 2025.

1.6.2.1 DarkSky Approved Port Marine Terminal Lighting Program

The Project intends to incorporate the guidelines of the DarkSky Approved Port Marine Terminal Lighting (PMTL) Program to optimize the lighting design while minimizing the effects of light pollution on nearby communities, adjacent waterways, and environmentally sensitive areas. The PMTL Program recognizes port lighting projects that incorporate sustainable lighting design practices to reduce light pollution while meeting illumination requirements for safe port operations. The program promotes design practices that minimize glare, light trespass, and sky glow, thereby significantly reducing the impact of artificial lighting on nearby communities and marine ecosystems.

The PMTL Program requires the port terminal to be divided into working zones. For lighting purposes, each working zone must have its own controls to meet operational and non-operational lighting settings.

All lighting will continue to meet applicable design codes (ANSI/IES RP-40-19). DarkSky compliance will support designs that are efficient and while minimizing impact to adjacent areas. The standard places special emphasis on light control in order to minimize glare, light trespass, and skyglow while providing adequate illumination levels for port operations. Selected luminaires shall provide adequate optical control to precisely direct and confine light to the intended operational areas. The lighting design shall confine and direct light to its respective work zone. At least 90 percent of the total lumens emitted by the lighting system shall be contained within the designated work zones to minimize light trespass and unnecessary illumination outside the operational areas.

1.6.3 Site Finalization

At the conclusion of building construction, the areas surrounding the buildings will be finished to grade with dense-grade aggregate (DGA) and geogrid described further in section 2.7.6.5, *Dense-Grade Aggregate*. The final stage will include construction of permanent site fencing, barriers, access gates, and security check points.

Perimeter control around the terminal site will consist of two different types of measures surrounding the entirety of the site, excluding the portions of the terminal site that are directly adjacent to Humboldt Bay. One control measure may be an architectural sound wall that will be used to prevent noise pollution for the Phyllis Rex Townhomes and the town of Samoa. The exact extents of the soundwall still need to be evaluated, but it is expected to be installed from the Phyllis Rex Townhomes to the Timber Heritage Association building. The other perimeter control measure will be an ornamental metal fence that will be installed around the entirety of the terminal site where the sound wall is not needed. Final design of building and fencing aesthetics will be influenced by ongoing discussion with the local residents, final perimeter fencing design may be influenced by evaluation of noise minimization measures, and all perimeter designs will be subject to requirements of permitting agencies.

Access to the terminal site will be controlled through three access gates. At each of the two terminal entrances, an ornamental metal gate matching the style of the perimeter fencing will be installed. The third access gate will be a chain link gate installed at the entrance to the North Access Road where it connects to Vance Avenue. This gate will match the chain link fence of the adjacent Timber Heritage Association property. All three gates will be designed to include a locking mechanism to control entrance into the terminal site.

1.6.4 Operational Terminal Access

1.6.4.1 Vehicle Access

There will be two access points into the terminal site during operation, the North and West Access Roads (**Figure 11**). The North Access Road will accommodate a combination of worker vehicles and standard highway trucks for deliveries. Large, overlength lowboy-type trucks are not anticipated to utilize the North Access Road. The West Access Road will accommodate a combination of worker

vehicles, standard highway trucks, and heavy-haul overlength lowboy-type trucks for delivery of equipment.

North Access Road

The North Access Road will follow an alignment similar to that of the existing access road off Vance Avenue and be constructed of two 12-foot aggregate-base lanes with 4-foot aggregate-base shoulders that will be sloped to drain toward the adjacent vegetated areas. The new road will be higher in elevation than the existing road, will tie in to Vance Avenue at an approximate elevation of 16.5 feet (NAVD88), and will maintain a minimum road surface elevation of 16.1 feet until it ends at the terminal site.

West Access Road

The West Access Road will follow an existing paved and gravel segment of the private access easement, between Vance Avenue at Recology and the recently constructed Phyllis Rex Townhomes in Samoa. The West Access Road will parallel to the GRTA corridor into the terminal site.

The West Access Road will be constructed to have two 12-foot paved lanes, two 6-foot Class II bike lanes, and two 2-foot aggregate-base shoulders that will be sloped to drain to the west, away from the terminal. Cyclists that wish to continue north will be provided access to the GRTA corridor Class I bikeway where the bike lanes cease on the West Access Road.

1.6.4.2 Bicycle Access

As described in detail in Section 2.5.2.1, *Class I Bike Path (multi-use trail) within the GRTA Right-of-Way*, a new Class I Bike Path trail within the GRTA right-of-way will be constructed and will extend the approximate length of the proposed marine terminal (approximately 1.2 miles in length) from LP Drive to the new North Access Road adjacent to the marine terminal (**Figure 10**). The trail will be built in compliance with the GRTA Master Plan and consist of two 5-foot paved lanes with two 2-foot aggregate-base shoulders, striped and signed intersections where the trail crosses existing roadways, two community access points, and two community trailheads.

1.6.5 Operational Utilities and Site Drainage at the Terminal

1.6.5.1 Existing Utilities

The utilities on the terminal site consist of electrical, fire-protection water, storm drain, and sanitary sewer utilities. These utilities will be re-routed outside of the terminal area or demolished and removed from the site.

1.6.5.2 Proposed Utilities

The utilities that are proposed to serve the terminal site are for domestic potable water, fire-protection water, storm drains, sanitary sewers, electrical distribution, roof-mounted solar, and telecommunications. Utilities in the uplands will be installed after the pre-loading operation is completed in a given area and the surcharge has been removed (discussed in section 2.7.6, *Soil Improvements*). Installation will include trenching and excavation to place buried conduits and duct banks, pipes, and structures (e.g., utility vaults), and may include stone bedding, followed by

backfilling and compacting to close the excavation. The wet utilities, electrical, and telecommunications infrastructure serving the site will be installed within a utility corridor up to 30 feet wide that follows the Vance Avenue and the West Access road alignments. Utilities within the site will be installed primarily within a utility corridor that will range between approximately 26-ft and 43-ft wide along the perimeter of the terminal site (**Figure 15a and 15b**). The proposed potable water lines will maintain a minimum horizontal separation of ten (10) feet from sanitary sewer lines and five (5) feet from other utilities.

Buildings at the terminal will require domestic water, fire suppression systems, sanitary sewer, telecommunication, and power. The wharves require water for fire suppression and electrical power. The utility corridor has reserved space for a joint trench that is anticipated to include telecommunications and electrical. The on-site potable water line and sanitary sewer lines will also run within the utility corridor but may not share the joint electrical and telecommunications trench. It is expected that two sanitary sewer lift stations will be connected to the buildings on-site and routed to the Samoa Wastewater Treatment Facility (WWTF).

Domestic Water Supply

The HBMWD will supply domestic water from the Mad River to the terminal site. The domestic water point of connection is at LP Drive on the western boundary of the terminal site where it connects to the existing 15-inch HBMWD domestic water main. Due to the estimated potable water and fire suppression demand at the site, the domestic water supply flow is not enough to continually feed the system. Therefore, an approximately 510,000-gallon tank is proposed for storage at the terminal. The tank will be refilled by the domestic water supply (**Figure 15a**).

During operations, domestic water is anticipated to provide water for restrooms, sinks, kitchens, drinking fountains, and other similar uses at all site buildings as well as water for the fire suppression system in the yard and buildings, and the concrete batch plant. The water pipes will largely run around the perimeter of the terminal site with offshoots to service areas as required. Each of the proposed buildings at the terminal will have a gross floor area of approximately 30,000 SF to 60,000 SF (see 2.6.2, *Terminal Buildings*) totaling up to 240,000 SF. Using the water demand of 0.09 gallon per day per SF, in accordance with the California Plumbing Code, the terminal site is anticipated to have a potable water demand of 15 gallons per minute to accommodate the proposed buildings. Currently it is anticipated the site will have two concrete batch plants in the designated area during operations. Based on the estimated water required to produce one foundation in a seven (7) day period, a single batch plant is estimated to require approximately 70 gallons per minute (GPM).

Fire suppression for the terminal site will be provided by the domestic water supply; the sprinkler system for the three proposed buildings will be designed in accordance with the National Fire Protection Association (NFPA) requirements. The terminal yard will have hydrants installed along the perimeter of the terminal site so as not to interfere with terminal operations. However, the size of the terminal yard poses a challenge for the perimeter hydrants to also sufficiently reach the center of the yard in the event of a fire. To address this issue, the use of underground hydrants in the center yard area and FDCs at the wharves will be installed. If the FDCs at the wharf are allowed to use seawater for fire suppression by the Samoa Fire Marshall, the full potable water system must be flushed if brackish water is used. Alternatively, the FDCs at the wharf could be stand-alone pipes that would not tie into the full potable system. In addition if brackish water is used for fire

suppression, the responding pump trucks will need to have stainless pumps that would be capable of handling brackish water.

Table 5 provides the total terminal site water demand for site operations and **Table 6** provides total water demand for fire suppression.

Table 5. Total Domestic Water Demand for Terminal Site Operations

Use	Demand (gallons per minute)	Demand (gallons per 24-hours)
Domestic (potable)	15	17,280
Concrete Batch Plant	140	201,600

Table 6. Total Water Demand for Fire Suppression at the Terminal Site

Use	Demand (gallons per minute)
Fire Sprinklers	2,000
Fire Hydrants	1,625

Sanitary Sewer and Wastewater Treatment

Sanitary sewer pipes will be installed on the terminal site to service the three proposed buildings. The sanitary sewer system will collect wastewater from the on-site buildings via a gravity collection system of manholes and pipes. The gravity network will terminate at one of two proposed sanitary lift stations to be developed on-site, based on the development phase. These lift stations will pump the wastewater through a force main to an off-site force main that convey flow to the Samoa WWTF.

Sanitary sewer pipes will maintain a minimum of ten (10) foot horizontal offset from water lines. In those instances where the sanitary sewer pipe and the water pipe are less than this, or where a vertical separation is less than 18-inches, the sanitary sewer piping will be encased in concrete per the applicable code requirements.

Wastewater treatment will be provided by the Samoa WWTF. The facility treats wastewater using primary settling tanks, pre-anoxic tanks, recirculating biological filtration units, and ultraviolet (UV) light disinfection. The disinfected and treated effluent will be pumped from the WWTF to an intertie with the ocean outfall pipe at Redwood Marine Terminal II. The Samoa WWTF is a modular system and can be expanded as needed, within the existing facility footprint, to accommodate increased wastewater flows. The force main that conveys the treated effluent from WWTF to the ocean outfall is approximately 0.75 mile long and 4 inches in diameter; it follows the proposed alignment for Vance Avenue included in the Samoa Improvement Plans from the Samoa Pacific Group (**Figure 15a**). Proposed upgrades to the Samoa WWTF by the Peninsula Community Service District are currently in the design phase and are anticipated to be completed prior to construction of the terminal site. Proposed upgrades are to ensure that there is adequate water delivery capacity to not only serve the terminal's anticipated wastewater generation but the ongoing and planned growth of the community of Samoa.

Storm Drainage

Because the terminal will create greater than 5,000 square feet of impervious surfaces, it is considered a “regulated project,” in accordance with the Humboldt Low-Impact Development Stormwater Manual and the Phase II Municipal Separate Storm Sewer System (MS4) Permit.⁴ As a regulated project, the Project must treat and retain runoff from the 85th percentile, or 24-hour, storm event. In the Humboldt Bay area, the 85th percentile, or 24-hour, storm event is equivalent to a storm that results in a rainfall of approximately 0.65 inches of rain in 24 hours.⁵

The terminal will utilize a combination of LID best management practices (BMPs) that include underground infiltration galleries, at-grade bioretention facilities, and treatment control BMPs to treat stormwater runoff from impervious areas prior to discharging from the site. In addition, the designs will meet the criteria of the State Water Resources Control Board (SWRCB) Statewide Trash Provisions to trap particles 5 millimeters and greater and not bypass trash below the design storm under the maximum operational loading conditions. According to the National Oceanic and Atmospheric Administration (NOAA) Atlas 14 database, the 1-year, 1-hour rainfall intensity within the vicinity of the Project site is 0.425 inch (i.e., a storm event that results in 0.425 inches of rain in 1 hour).⁶

All existing storm drain systems identified within the terminal site will be removed or abandoned in place with slurry fill, based on geotechnical recommendations. The new site grading and drainage plans proposes to collect runoff, based on the proposed contour grading (**Figure 16a and 16b**). Within the entire north end of the site, adjacent to the wharf and within the perimeter of the ring cranes, stormwater will be collected in grate inlets with low-impact development (LID) treatment media that also have trash capture capacity, then outfall to the bay (**Figure 16b**). Within the southern portion of the site, adjacent to the wharf, grate inlets will also be used to collect stormwater runoff. However, because the southern end of the site already has good stormwater runoff infiltration rates, the stormwater will first be conveyed to infiltration galleries to treat the water-quality volume (WQV) before bypassing larger storm events into the bay. Within the southern end of the site, and outside the ring crane perimeter, trench drains will collect the stormwater runoff and similarly convey it to infiltration galleries prior to bypassing the larger storms into the bay.

Bio-filtration planters with WQV capacity and 10-year overflow risers will be installed around the buildings for rooftop stormwater collection and LID treatment. The treated and overflow runoff will connect to the closest infiltration gallery; larger storm events will be bypassed to the bay.

⁴ State Water Resources Control Board Order No. 2013-0001-DWQ, NPDES No. CAS000004, as amended by Order WQ 2015-0133-EXEC, Order WQ 2016-0069-EXEC, Order WQ 2017- 0031-DWQ, Order WQ 2018-0001-EXEC, Order WQ 2018-0007-EXEC, and Order WQ 2019-0009-EXEC. General Permit for Waste Discharge Requirements for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems.

⁵ North Coast Stormwater Coalition. Humboldt Low Impact Development Stormwater Manual v3.0. August 18, 2021.

⁶ National Oceanic and Atmospheric Administration (NOAA). Point Precipitation Frequency Estimates. NOAA Atlas 14, Volume 6, Version 2. Retrieved July 15, 2026, from <https://hdsc.nws.noaa.gov/pfds/>.

Infiltration Galleries

Underground infiltration galleries (Rotondo StormPod Lo-Pro or equivalent)⁷ will store and infiltrate the 85th percentile WQV. Infiltration rates were tested in eight locations around the site; the most favorable conditions were in the southern portion of Surcharge Area 1 and all of Surcharge Areas 2 through 5 (**Figure 16b and 16c**). Accordingly, infiltration galleries are proposed in these areas. A combination of trench drains and grate inlets will convey the WQV from the backlands to the galleries where it will infiltrate into the subsoils at a design rate that will achieve drawdown within 72 hours. The infiltration galleries will have overflow pipes that will allow storm events exceeding the WQV to discharge to the bay.

Bio-Filtration Planters

Bio-filtration planters are proposed to collect and pre-treat site runoff prior to sending the flow to StormPods (infiltration vaults). Bio-filtration planters consist of four distinct components:

- **Surface Ponding Zone** — Provides temporary surface storage of precipitation and runoff that promotes infiltration into the lower components.
- **Soil Media Layer** (typically consisting of a sand/compost mix) — Allows for storage of runoff in the void spaces of the media, supports plant growth, and provides treatment through filtration, volatilization, biological uptake, media adsorption, and vegetative transpiration.
- **Gravel Storage Layer** — Allows storage of runoff in the void spaces between the rock and promotes infiltration into the native soils below. The gravel layer may or may not include an underdrain, which allows discharge in the occasional case that the storage and volumetric losses (infiltration and evapotranspiration) are insufficient to retain all precipitation and runoff.
- **Underlying Native Soil** — Infiltration into the native soil is dependent on the characteristics of the native soil. Infiltration into the native soils is promoted by ensuring that the native soil beneath the bioretention basin is uncompacted. Because the bio-planters are near the tops of fill slopes, impermeable liners and underdrain pipes will be installed to prevent undermining the slopes.

Bioretention and Trash Capture

In areas with low infiltration rates near the proposed wharves and heavy-lift equipment, such as the ring cranes, runoff will be treated by structural media infiltration devices that also utilize bioretention processes for stormwater treatment. Modular Wetland Systems (MWS) bio-filtration vaults will be installed to remove trash and treat stormwater before discharging to the bay. The MWS is a pre-engineered biofiltration system that includes a pretreatment chamber with filtration cartridges, a biofiltration chamber with an underdrain system, and a discharge chamber with an orifice control structure. The biofiltration chamber contains a sorptive media mix that does not include organic material.

⁷ StormPod is a modular, single-chambered, precast groined arch system that is engineered for underground installation. The arch design system is capable of supporting fill depths between approximately 1 foot and up to 25 feet. It can support high loading requirements and is modular, allowing multiple configurations as well as easy maintenance.

The biofiltration vaults will be located either at each grate inlet or at the downstream end of the trench drains to treat runoff prior to discharging to the storm drain system. Consistent with the Humboldt LID manual, the biofiltration vaults will be designed to treat runoff from the 85th percentile, or 24-hour, storm event. The biofiltration vaults will also be designed to capture trash and debris up to the 1-year, 1-hour storm event.

Drainage

Existing off-terminal drainage currently either flows to collection points in Samoa and is conveyed through the site via subsurface stormdrain pipes or flows overland onto the terminal. Due to the ground improvements and proposed grading of the backland, off-terminal runoff is anticipated to collect and pool along low points of the terminal site boundary where it was previously collected or flowed across the site, either ponding or discharging to the bay. New stormdrain pipes will be installed that connect to existing drainage collection points and conveyed through the site to existing outfall locations.

Off-terminal drainage originating in the northern portions of the site, flowing to the site in the vicinity of the Timber Heritage Association property, will be conveyed through an existing vegetated swale that discharges to Humboldt Bay and flows under the existing access road. A new box culvert will be installed with the new North Access Road. Off-terminal drainage originating along the community Samoa currently flows to a collection point near the Post Office. The existing pipes that convey stormwater under the terminal site to Humboldt Bay will be replaced with equal or larger pipes and discharge at an existing outfall location. Off-terminal drainage originating between LP Drive and the Phyllis Rex Townhomes will be conveyed along the western boundary of the West Access Road, following the existing drainage path and vegetated areas adjacent to LP Drive. To relieve drainage collection at certain points along the raised terminal boundary, the terminal will install 10-year and 100-year overflow pipes throughout the site (**Figure 16b**).

1.6.5.3 Electrical Infrastructure

Existing Utility Infrastructure

The terminal site is currently fed from PG&E's 1103 circuit, a 12 kV distribution line on wood poles that currently transverse the terminal site from the Fairhaven substation 12 kV switchyard to Samoa. At this time, the load-hosting capacity of the Fairhaven 1103 circuit is 7.27 MW, which may be adequate to feed Phase 1 of the Project; however, with the planned buildout of this terminal, as well as buildout of Samoa, an alternate design is being proposed. A PG&E service application will be necessary to confirm load serving and PV generation capacity.

Proposed Electrical Infrastructure

The Project will include overhead and underground utility relocations, construction of transmission lines, and installation of electrical substations and microgrids. The proposed electrical infrastructure will serve the site with redundant 60 kV lines from the Fairhaven substation.

Project construction phasing is detailed in section 2.7.1, *Project Phasing and Schedule*. Although the operational Phase 1 load is estimated to be 24.641 megavolt amperes (MVA), the combined electrical load for Phase 1 and 2 of terminal development is estimated to be 28.812 MVA. Individual phase loads could be independently fed by a single 12 kV line, but this will require an upgrade of the

Fairhaven substation transformer bank and 12 kV yard and will not provide redundancy in the power supply to the site. Therefore, for planning purposes, redundant 60 kV lines from the Fairhaven substation will ultimately feed the site, each independently capable of supplying power to the full site once Phase 1 and Phase 2 development are complete.

An overhead double-circuit 60 kV transmission line on about 60-foot-tall steel poles will be constructed from an upgraded 60 kV switchyard at the Fairhaven substation to the terminal site. A 15-foot expansion of the existing Fairhaven-Evergreen Pulp-Fairhaven Power Plant 60 kV PG&E easement will be required to accommodate this new transmission pole line. Once at the terminal's southern boundary, the lines will transition underground and be routed to their prospective substation. Optionally, one of these lines could be fed from the Fairhaven Energy Storage Project, once built, for backup "islanded" terminal operations when the utility is unavailable.

Two new substations will be constructed at the terminus of the new transmission lines for transformation from 60 kV to 34.5 kV for distribution throughout the terminal site. One substation will be constructed during Phase 1 (Substation North) and the other substation during Phase 2 (Substation South).

Power distribution throughout the site will be through a 12.47 kV underground ring with 15 kV outdoor switchgear located at each substation. This switchgear will be equipped with a main circuit breaker and four feeder circuit breakers, one to feed the loads associated with each phase and a normally open tie breaker to feed the other substation in case one of the two redundant 60 kV electrical services is down, along with the two spare breakers. Each building will be fed at 12.47 kV from outdoor 15 kV switchgear. Power will be stepped down to 480 volts (V) for interconnection of a roof-mount PV system, a grid-interactive battery energy storage system (BESS), a backup generator, and building 480 V loads. All pad-mount transformers associated with the terminal will utilize natural ester insulating fluid for reduced flammability and biodegradability.

For Phase 2 of the terminal, PG&E circuit 1103, which currently traverses the Phase 2 terminal site, will be rerouted around the terminal site overhead or underground to the community of Samoa. A new or expanded utility easement will be required around the south and west boundaries of the site to accommodate rerouting of this circuit.

The Pulp Mill 60 kV substation and 12 kV switchyard is expected to be upgraded and sized to provide an additional 5 MW of dedicated capacity to the terminal site. Given the additional 5 MW of capacity, it is proposed that the Phase 1 2.5 MW landfill PV system connect to the Pulp Mill substation from a new overhead or underground interconnection 12 kV distribution line. Interconnection at this location will require a new 12 kV switchyard, which is anticipated to comprise a 15 kV switchgear lineup, including PG&E metering, a main circuit breaker, and a feeder circuit breaker for collecting power from step-up transformers located throughout the array.

Phase 1 Building Substation and Microgrid

A Phase 1 microgrid electrical substation is proposed to be sited adjacent to the Storage and Assembly Building. It will provide power to the facility as well as serve critical loads in the north end of the terminal. A 480 V microgrid is proposed for the Storage and Assembly Building in Phase 1 of terminal construction.

Photovoltaic System

The proposed PV system is based on a 50,000-square-foot Storage and Assembly Building. The PV system will include a roof-mounted PV array with an approximate system size of 300 kilowatts direct current (kWDC). The system will utilize rows of 420-watt, high-efficiency monocrystalline modules that will be flush-mounted in rows in landscape orientation at a tilt of 14 degrees. The modules will have a flush-mount attachment to a standing-seam metal roof. The design includes International Building Code access pathways and smoke ventilation setbacks.

Power generated by the arrays will utilize alternating-current (AC) conversion through three 100 kW, 480 V inverters adjacent to the building for 480 V three-phase interconnection into a building's 480 V switchgear. These inverters are UL 1741-SA listed and can be frequency controlled by the BESS to ramp PV output and balance generation with the load. The direct-current (DC)/AC ratio is 1.01 for minimization of equipment variation on the overall site; however, inverter capacity could be downsized to a DC/AC ratio of up to 1.25, with minimal clipping with further inverter optimization. The inverters are anticipated to be connected to the building's 480 V switchboard through a solar subpanel and a visible, lockable disconnect to be located next to the inverters for ease of shutdown in the case of a fire.

Battery Energy Storage System

The terminal includes a 1.9 MW BESS with 3 hours of energy storage. The duration is based on a battery load estimate of 1.3 MVA for Phase 1 critical loads. Shedding of noncritical loads during grid outages can be implemented to extend the hours of resiliency; however, the power distribution system must be designed to accommodate this.

15 kV Switchgear

The substation includes a new 12.47 kV, outdoor-rated main switchgear lineup containing a controllable main breaker to be supervised by a Schweitzer Engineering Laboratories 700GT+ Intertie and Generation Relay Islanding Controller, which interfaces with the assembled site controller to provide seamless transitions to an islanded battery-powered state and retransfers back to the local utility grid. The main switchgear contains all the metering, control, and uninterruptible power supply equipment required for operation and for PV, BESS, and load control and monitoring to ensure safe, stable grid-connected and microgrid operation. The switchgear feeds a loop-feed, pad-mount 12.47 kV step-down transformer and secondary 480 V switchgear for interconnection of the battery and generator and to feed the building and wharf loads.

Emergency Generator

A 2 MW generator for emergency backup operations will serve the Phase 1 critical load of 1.3 MVA. The expected runtime of the emergency generator is based on the reliability of the grid serving the terminal site but will include a subbase day tank for a minimum of 24-hour runtime. For short-term grid outages, the microgrid battery system will provide backup power. With the ability of the Humboldt Bay Generating Station to island during state-wide Public Safety Power Shutoff (PSPS) events, long-term transmission-level outages due to out-of-county safety issues are expected to be infrequent. Generator runtime could range from 12 hours to 500 hours per year. Generator operation of 1 hour per month is required for maintenance purposes to ensure proper lubrication of the generator and verify system functionality and load transfer capability. Generator operation may be required during future electrical infrastructure work as the Project phases are implemented.

Phase 1 Distribution Substations

The 12.47 kV distribution will be looped around the site perimeter to serve loads around the terminal site. Substations will be provided to serve offshore OEM equipment, vehicle/equipment charging, and ring cranes. In addition, power will be provided quayside for vessel shore power.

Phase 2 Building Substation and Microgrid

The preliminary design for a Phase 2 substation and microgrid is similar to that of Phase 1, with the primary differences being the increased number of buildings available for solar generation and the higher estimated load and projected battery (critical) load in Phase 2.

Photovoltaic System

The combined available rooftop space of 560,000 square feet for Phase 2 buildings was used to model system performance and estimate the annual production of solar energy. The general equipment specifications and design are similar to those for the Phase 1 design.

Battery Energy Storage System

Phase 2 also includes a 1.9 MW/2-hour BESS with 1.5 hours of energy storage. The duration is based on a battery load estimate of 2.3 MVA for the Phase 2 critical loads. Shedding of noncritical loads during grid outages can be implemented to extend the hours of resiliency.

15 kV Switchgear

In general, the 15 kV switchgear will be similar to Phase 1 equipment but sized and specified for individual or groups of buildings and their associated solar generation capacities.

Emergency Generator

There will be a 2 MW generator for emergency backup operations to serve the Phase 2 critical load of 2.3 MVA. The expected runtime of the emergency generator is based on the reliability of the grid serving the terminal site. As in Phase 1, the microgrid battery system will provide backup power and generator runtime could range from 12 hours to 500 hours per year. Generator operation of 1 hour per month is required for maintenance purposes to ensure proper lubrication of the generator and verify system functionality and load transfer capability.

Off-site Landfill Solar Panel Installation

As described in detail in Section 2.5.2.1, *Landfill Solar Array*, the nearby Harbor District-owned LP Samoa solid waste landfill has been identified as a site for local off-site solar generation from a large, ground-mounted solar PV system (**Figure 7**). Solar energy generated from the approximately 800 kW combined PV system will be used to supplement energy use at the terminal. The PV system will connect to the upgraded Harbor District substation from an underground 12 kV line during Phase 1 of terminal construction. Interconnection at this location will require a new 12 kV switchgear lineup, including PG&E metering, a main and a feeder circuit breaker collecting power from step-up pad-mount transformers distributed throughout the array, control power, and a backup battery system.

Phase 2 Terminal-Wide Microgrid Option

For Phase 2 of terminal construction, the Fairhaven Energy Storage Project and the landfill PV system could be integrated into a terminal-wide microgrid that could provide a significant amount of solar energy and site resiliency. This size of a microgrid has the potential to serve a large portion, if not all, of the terminal site's loads during grid outages.

Phase 2 Distribution Substations

The 12.47 kV distribution will be looped around the site perimeter to serve loads around the terminal site. Substations will be provided to serve offshore OEM equipment, vehicle/equipment charging, and ring cranes. In addition, power will be provided quayside for vessel shore power.

1.7 Operations and Maintenance Dredging

A total of 31,000 yd³ of annual accretion is predicted to occur within the Project footprint (primarily from sand shoaling). As a result, and to maintain operations, it is likely that approximately 124,000 yd³ will need to be dredged every 4 years, most likely using the same equipment used by USACE to dredge the navigational channel. The model result indicates that the future U.S. Army Corps of Engineers (USACE) operations and maintenance (O&M) dredging volume in the federal navigation channels is predicted to decrease.

These volumes were derived from sand and fine sediment transport modeling using the MIKE-21 model suite developed by DHI, with coupled hydrodynamics and sand transport (ST) and mud transport (MT) modules. MIKE-21 is an advanced software suite for simulating and analyzing water flow, currents, wave conditions and processes in marine and coastal environments. The model grids (both the existing condition and the with-Project scenario) and boundary conditions (in terms of tides and freshwater discharge) were the same as those used for tidal hydrodynamics. Complete ST and MT model development, input parameters, and model calibration are provided in a Coastal Processes Report (Moffat & Nichol 2026).

1.8 Construction and Demolition at the Project Terminal

The Project includes demolition of existing structures, site preparation, marine terminal construction, dredging, establishment of wet storage sites, habitat restoration, and relocation of Existing tenants currently on the terminal site.

1.8.1 Project Phasing and Schedule

Overall site development will occur in multiple phases, as shown in **Figure 17**, and follow the schedule shown in **Table 7**.

- Phase 0 will consist of improving the North and West access roads, onsite demolition and all onsite improvements (i.e., utilities, access roads, landfill solar array), the offsite improvements on Woodley Island, and constructing the onsite mitigation/habitat restoration area.

Construction dates are dependent on funding and permitting, but construction is assumed to start in 2028 and be completed in 2029.

- Phase 1 will consist of the majority of the on-site development of the site to accommodate S&I and foundation assembly activities as well as create a sinking basin for the semi-submersible barge and the wet storage areas in the waters adjacent to the terminal site. Phase 1 development includes, soil improvements over the entire 180-acre terminal site as well as construction of the full 1,700 feet of the northern wharf but only 600 feet of the southern wharf. Phase 1 is assumed to start in 2029 and be completed in 2034. Operations on the northern S&I site could start as early as 2034.
- Phase 2 will consist of developing the electrical infrastructure along the remaining approximately 30-acre property currently owned by Sniper Enterprises and constructing the remaining approximately 1,200 feet of the southern wharf to accommodate the second S&I site. Phase 2 is assumed to start in 2035 and be completed in 2037.

Table 7. Construction Schedule

Milestones	Duration	Anticipated Timeline
All Permits in Hand		2028
Constraints		
In-Water Work Window	July 1–October 15 each year ^a	
Assumptions		2028–2037 construction scenario ^b
Marine Construction Shift	12 hours per day (6 a.m.–6 p.m., with pile driving limited to 7 a.m.–5:30 p.m.)	
Marine Construction Workdays	6 days per week	
Dredging Work Hours	24 hours per day	
Dredging Workdays	7 days per week	
Upland/Backlands Shift	10 hours per day (6 a.m.–4 p.m.)	
Upland/Backlands Workdays	7 days per week	

^a. Three seasons require longer clamshell dredging windows and pile removal, but cutter suction dredge windows and pile-driving activities will be kept within the work of July 1 through October 15 each year.

^b. The actual construction period may occur at a later date, depending on permitting, funding, and developer timelines.

1.8.2 Construction Access and Material Delivery

1.8.2.1 Construction Access

Construction access will be from both land and water to the terminal site. Two land-based access points will be constructed during Phase 0 and used during Phases 1 and 2 (**Figure 17**). The North Entrance will be at the north side of the site and accessed from Vance Avenue. The West Entrance will be at the southwestern side of the site and accessed from the West Access Road that connects to New Navy Base Road.

It is expected that any large deliveries, such as construction crane components and piles, will be delivered through the West Access Road or from water by barge. A construction road on-site will need to be maintained at all times to allow for unobstructed movement of equipment, material, and personnel within the site. The contractor will be responsible for this and will need to coordinate with all subcontractors to resolve access conflicts and facilitate construction access and material deliveries.⁸ Smaller deliveries and the construction workforce will most likely use the North Entrance to gain access to the site but may use the West Access Road when necessary if certain work makes access impractical or unsafe.

The waterfront construction area will be accessed directly from Humboldt Bay using floating equipment including tugs and barges. Due to the shallow depths near shore, the contractor will most likely need to perform some amount of the planned dredging to deepen shallow and gain closer access to the construction site. Early Phase 1 construction activities include dredging and construction of the southern wharf to provide waterside access. Crew boats will be utilized to transport the workforce to and from the floating equipment.

The contractor will be required to coordinate directly with the California Department of Transportation (Caltrans) and appropriate local authorities, such as the police and local road departments, regarding the use of public roads, particularly with respect to wide, long, or heavy loads. Similarly, the contractor will be required to coordinate with the U.S. Coast Guard and the Harbor District with respect to marine access, mobilization and moorage of floating equipment (e.g., derrick barges, flat barges, hydraulic dredges, tugs) at the site.

1.8.2.2 Material Delivery

Common construction materials will be delivered to the terminal site by truck using either of the entrances described above. DGA will be transported to the terminal site by barge and truck. Larger quantities used for the wharf and backlands will most likely be supplied by barge, while smaller quantities will be delivered by truck. The material will be offloaded from the barge into the backlands either by a derrick barge and bucket or a barge that has an integrated conveyor system that can offload material directly from the barge to the backland staging area.

The steel piling (piles) can either be brought to the terminal site in full lengths on a material barge or in smaller sections by truck and subsequently spliced together on-site. Once spliced, the piles will need to be rehandled onto a material barge for use by the pile-driving derrick barges or for landside crane operations. The piles can be stockpiled directly behind the landside crane within its swing radius. If the piles come in full lengths, there may be a need to rehandle the piles into the backlands and stockpile them to ensure the material barge can be used to receive the next load of piles.

1.8.2.3 Equipment Delivery

Large floating equipment (e.g., derrick barges, hydraulic dredges, flat barges, scows) will be brought to the terminal site by tugboat. Land-based equipment will be brought to the site by trucks. Some larger equipment such as crawler cranes will require multiple truck loads and multiple days to assemble on-site. Some of these large loads will require special permits and coordination with local authorities if the load is too wide, too long, or too heavy per regulations.

⁸ The contractor will be the entity hired by the Harbor District to complete construction of the project.

1.8.3 Staging

The terminal will require on-site staging areas for the contractor and subcontractors to accommodate the contractor's temporary offices, material storage and stockpile areas, equipment storage and maintenance areas, supplies, and parking for the construction management and construction workforce. This area will typically be given a designated area in the backlands; however, due to the site improvements, it is anticipated the staging area will need to relocate multiple times throughout the terminal as the preload surcharge area moves. Schedule permitting, materials could be stockpiled after the first surcharge area is completed to avoid rehandling.

In addition, the contractor will require designated water access staging, water laydown areas, and moorings for derrick barges, dredges, material barges, tugs, and crew boats. The contractor may request the installation of multiple mooring points in the terminal water work limits to moor vessels, barges, and other floating equipment. The water access staging may also include temporary gangways and floats that connect to shore on-site for construction workforce access, or the contractor may make use of the existing marine facilities in the Project area, in which case the floating equipment's crew will park off-site.

1.8.4 Temporary Construction Facilities

Temporary or permanent perimeter fencing and guard access checkpoints/gates will be installed prior to the start of construction to secure the area. Rerouting of existing utilities while new infrastructure is constructed will be necessary prior to the start of construction. In addition, the installation of a temporary trestle may be necessary for access to the waterside structures needing demolition. The trestle will run parallel to the shore such that a crane can gain access to the waterside structures to be demolished. Approximately 3,000 linear feet of trestle may be needed. The trestle will be supported with approximately 200 temporary steel piles and a temporary deck.

1.8.5 Demolition

The Project will require demolition of various structures in the backlands as well as the existing onsite waterside timber wharf structure and pilings. All existing facilities on the terminal site will be demolished (**Figure 18**). The demolition phase (Phase 0) will include the following:

- Demolition of backlands structures, utilities, foundations, etc.
- Demolition of existing wharf structures and removal of piling and bulkheads (275,000 square feet of deck removal and approximately 3,800 piles).
- Demolition of three timber piers.
- Disposal of treated wood waste.
- Disposal or recycling of demolished concrete and asphalt.
- Removal of debris along rock slope and regrading of slope as required.
- General clearing and grubbing in preparation of mass grading and surcharge placement.

The upland/backland structures will be removed using excavators and other equipment (e.g., graders, loaders, backhoes) to demolish and process the structures. The processed materials will be

sent by truck to West Central Landfill, Anderson Landfill, or Glenn County Solid Waste Disposal, depending on the material type and hazardous classification. Hazardous materials resulting from or generated during demolition activities will be handled, transported, and disposed of pursuant to applicable state and federal guidelines. Concrete demolition will consist of a combination of on-site reuse, off-site recycling, and off-site disposal.

Removal of debris along the shoreline rock slope will be performed by excavators, land-based cranes, or water-based cranes, depending on the location (i.e., depth or distance from the shoreline) and weight of the debris.

The wharf deck will be demolished by either a backhoe or excavator by driving onto the deck and peeling the deck from the outer edge back to the shore. If the wharf is not strong enough to support this then it will be demolished using a trestle to provide necessary access to the structure farthest from shore or from the water using a floating crane. The waterside edge of the wharf will most likely require dredging to facilitate access for the floating demolition equipment.

If a trestle is used, it will be built so that a crane can walk from the land and onto the trestle to reach sections of the wharf that are too far away to be reached from the shore. Removed structure pieces can be laid on the trestle; another piece of equipment will move them from the trestle and back to the land to be processed. The crane would be assisted by a waterside crew, using a combination of work boats (or skiffs) and work floats for access underneath the wharf. These will work in tandem to rig the crane into sections of the wharf, with the waterside crew using a saw to disconnect the rigged section from the remaining structure.

If a floating crane is used, a similar waterside crew will be used to assist with rigging and removal of the sections. The removed section will be placed on a material barge next to the floating crane. Removed sections will then be rehandled into either the backlands or another laydown area to be processed and sent to a landfill.

The remaining piles will be removed either by dry pulling or by vibratory hammer. Dry pulling is performed by wrapping a pile with a chain sling to choke it. The chain is attached to rigging and back to a crane; the crane pulls on the pile to remove it. If the piles do not come out, or break during removal, the contractor may use a vibratory hammer. The vibratory hammer hangs from the crane and uses a hydraulic clamp to attach to the head of the pile. The hammer has an internal mechanism that oscillates and causes the pile to vibrate and liquefy the soil surrounding it, allowing the pile to be extracted with less force. The removed piles will be rehandled to the backlands or another laydown area to be processed and then sent to a landfill. Any timber piles not fully extracted within the dredge template will be cut at the design finish grade and removed using a clamshell dredge.

1.8.6 Dredging

The proposed Project includes new dredging to accommodate berths for vessels, new wharfs, wet storage for floating foundations and fully assembled WTGs, and a sinking basin. Material will be removed using hydraulic or mechanical dredging methods depending on placement/disposal location site(s). The dredge design depth will be -40 ft MLLW at the approach to wharfs and -38 ft MLLW at the wet storage areas. A sinking basin will be dredged to -60 ft MLLW within the north wet storage area. A summary of the dredge quantities associated with each area as well as type of dredging is summarized in **Table 8**.

Table 8. Dredge Quantities

Dredge Method Equipment	Dredge Area	Grade Volume (yd ³)	Including 2 ft Overdredge
Cutter Suction Dredge	North Wet Storage and Sinking Basin	720,000	800,000
	South Wet Storage	2,100,000	2,300,000
	Approach Area	1,850,000	2,010,000
Clamshell Dredge	Approach Area planned for placement at HOODS	60,000	70,000
	North Wharf Slope	790,000	810,000
	South Wharf Slope	510,000	530,000
Total Dredging		6,030,000	6,520,000

Humboldt Open Ocean Disposal Site (HOODS)

*Please note volumes are adjusted upward for conservative analyses in the EIR assessment.

1.8.6.1 Sediment Management

The western bank, shoreline of the terminal requires the demolition of the old wharf, removal of piles, and removal of rock and other debris. This work must be completed with a clamshell dredge. Material found suitable for ocean disposal will be placed at the Humboldt Open Ocean Disposal Site (HOODS) or beneficially reused at available receiver site. If material is not suitable for open water placement, the material will be rehandled on land and beneficially used as fill or disposed of at a landfill. Approximately 500,000 yd³ is assumed to be rehandled on land and approximately 910,000 yd³ is estimated to be suitable for placement at HOODS (**Table 9**).

The south wet storage area, north wet storage area, and sinking basin are predominantly sand and are planned for placement as surcharge of direct placement on the Samoa Beach. The dredging must be conducted with a hydraulic CSD to mobilize the sediment for placement on land as surcharge or pumping to the beach as nourishment. Approximately, 5,110,000 yd³ is planned for use as temporary surcharge (2.6.7.4, *Soil Preloading Surcharge*) or beneficial re-use. If placed as surcharge, material will then be hauled to Samoa Beach or other approved site(s) for beneficial use after surcharge is complete. Dredged material will be dewatered within the respective surcharge areas using weirs. Weir structures used for dewatering will be constructed in each surcharge area to be filled with hydraulically placed dredged material.

Table 9. Dredging Work Summary

Dredge Type	Quantity (yd ³)	Disposal Location
Cutter Suction Dredge	5,110,000	Surcharge/Beach
Clamshell Dredge	910,000	HOODS,
Clamshell Dredge	500,000	Mechanically Unloaded Onsite
Total Dredge Quantity	6,520,000	

1.8.6.2 Dredging Schedule

Dredging activities are expected to take 5 years (**Table 10**). The sequence of dredging is aligned with soil surcharge requirements to prepare the terminal site (2.6.7.4, *Soil Preloading Surcharge*) in order to minimize material rehandling and to accommodate in water work windows where possible.

The in-water work window is typically July 1 through October 15 of each year in Humboldt Bay. Clamshell dredging of shoreline and material deemed unsuitable for placement at HOODS in Years 1 and 2 will most likely need an extended window to complete the work within the proposed timelines (**Table 10**). The extended in-water work window in Year 1 is for the purpose of completing the Phase 1 South Wharf to support Year 2 dredging. The Year 2 dredging will utilize the South Wharf to unload dredged material not suitable for placement in the marine environment (per USACE/USEAP guidance). The proposed clamshell window extension for Year 2 is to allow the relatively slower operation of dredging and rehandling of the anticipated unsuitable material, which is critical to keep the Phase 1 North Wharf demolition and construction path on schedule.

Dredging operations will work continuously 24 hours a day. The CSD will work 7 days per week, while the clamshell is assumed to work 6 days per week. The dredges will be crewed by either two crews working 12 hours or three crews working 8 hours per day. The wharf areas and wet storage areas are far enough away from each other that dredging operations can be run independently of each other.

Table 10. Anticipated Dredging by Construction Year for Both Clam Shell Dredging and Cutter Suction Dredging Activities.

	Clamshell Dredging		Cutter Suction Dredging	
	Season Quantity (yd ³)	Season Duration	Season Quantity (yd ³)	Season Duration
Year 1	455,000	March 15 - June 30 ^a	1,000,000	July 1 - Oct 15
Year 2	500,000	Feb 1 - Oct 15	800,000	July 1 - Oct 15
Year 3	455,000	July 1 - Oct 15	1,050,000	July 1 - Oct 15
Year 4			1,150,000	July 1 - Oct 15
Year 5			1,110,000	July 1 - Oct 15
Totals	1,410,000		5,110,000	

^a Dredge season is performed early to allow rock placement and pile driving to occur inside regular in water work season.

1.8.6.3 Dredging Construction Methods

It is expected that the contracted dredging operator will need multiple pieces of equipment to dredge the large quantities of sediment within the Marine Subarea. However, the waterfront areas are only large enough to efficiently accommodate two or three pieces of floating equipment, along with support barges. It is expected the contractor will have a combination of two or three dredges or derrick barges at a time during the construction phase. In addition, the Wet Storage Subarea is far enough away from the wharf work areas that additional dredge work can occur simultaneously.

Multiple types of dredging are required to meet Project needs. Portions of the material may be used for surcharge and construction fill at the terminal site. The Harbor District is also pursuing opportunities to beneficially use the dredged material for beach nourishment at Samoa Beach or other beneficial reuse areas. The dredge material must have the appropriate grain size and be tested for contaminants for these uses to occur. In addition, a portion of the dredged material may be disposed of at the HOODS. The *suitability* of dredged material depends on the destination and/or use

of the material. Based on sediment chemistry results⁹, contamination of dredged material is not of sufficient magnitude to preclude ocean disposal apart from one location (North Wharf dredge area), which failed initial biological testing parameters but is being further tested at higher resolutions under a new Sampling Analysis Plan. The rest of the tested sediment material has been demonstrated to be suitable for placement at HOODS or beneficially used to nourish the beach. Based on discussion with resource agencies, the desire is to beneficially reuse all the material if possible. Therefore, it is assumed the sandy materials will be placed at a nearby beach. Dredge material with higher clay contents (aka, fines) can cause turbidity plumes when placed in the nearshore environment and is therefore *unsuitable* for beach replenishment but may be suitable for other beneficial use options, like wetland or saltmarsh habitat replenishment to combat sea-level rise.

Hydraulic dredging using a CSD will be implemented in the sandy areas where material is to be temporarily placed on the terminal as surcharge or directly in the nearshore. Hydraulic dredging will not be used in areas where obstructions are expected, such as areas with large rocks or timber pile remnants. Clamshell dredging is ideal for more precise work or if obstructions are expected, such as along the wharf face. It is assumed clamshell dredging will be used for initial passes where there could be debris or timber pile remnants, final grade cleanup work, and cutting slopes.

Access to Samoa Beach for the transport of dredged material will be via the sand ramp at the intersection of LP Drive and New Navy Base Rd. Additionally, a temporary culvert of minimum diameter of 48 inch will be installed under New Navy Base Rd roughly 100 ft south of the centerline of the LP Drive intersection. The culvert will be made available to the hydraulic dredging operation as a direct pipe route. The dredge pipe will be threaded through the culvert so that dredge material can be pumped to Samoa Beach without interfering with traffic on New Navy Base Rd or heavy-duty truck access to the Recology Humboldt County facility. Additional culverts or sand ramps will be constructed within the Project site for vehicle and construction equipment access around the Project site at the pipeline crossings.

As discussed in Section 2.8.5, *Demolition*, the timber wharf demolition will happen simultaneously with dredging to gain access to the piles for removal. Therefore, multiple vessels (i.e., dredges, tugs) and supporting equipment (i.e., barges, scows, tenders) will be used simultaneously during in-water work.

1.8.6.4 Dredging Equipment

The discussion below describes derrick barges and the types of dredges that are expected to be used for the Project. Material may be dredged and placed by hydraulic and/or mechanical methods.

⁹ The first field and testing program was implemented in March 2026 as proposed in the approved SAP (Moffatt & Nichol (M&N), 2025), consistent with the Evaluation of Dredged Material Proposed for Ocean Disposal (Greenbook) (U.S. Environmental Protection Agency [EPA]/ U.S. Army Corps of Engineers [USACE], 1991), the Evaluation of Dredged Material Proposed For Discharge in Waters of the U.S., and the Inland Testing Manual (ITM) (USEPA/USACE, 1998), the Upland Testing Manual (UTM; USACE, 2003). Sampling was conducted in accordance with U.S. Army Corps of Engineers Nationwide Permit 6 (File No. SPN-2024-00109), California Coastal Commission Coastal Development Permit Waiver No. 1-24-0192-W, and the North Coast Regional Water Quality Control Board General 401 Water Quality Certification (WDID No. 1B25041WNHU; ECM PIN No. CW-900403).

Cutter Suction Dredge

Hydraulic dredging using a CSD is a highly efficient method of removing material using a revolving cutterhead to till material that is suctioned through the intake behind the cutterhead powered by a centrifugal pump and transported via submerged or floating pipeline to the disposal location. The cutterhead is positioned at the end of a ladder that is limited in its reach, even including a ladder extension. CSD can dredge approximately 15,000 to 20,000 yd³ of sediment in a day.

Disposal or transport of dredged material associated with hydraulic dredging relies on maintaining material in a suspension through the CSD pipeline between the removal and deposition points with approximately 15 percent dredged material and 85 percent water. Material removed through hydraulic dredging may be placed through the open end of the pipeline. Hydraulically placed material can be pumped to the surcharge areas, Samoa Beach, or other nearby beneficial reuse area.

During dredging activities, CSDs are positioned by a tugboat. Once in place, the dredge will hold its position and move itself through its cut using two spuds located opposite the working end and two swing anchors on the working end. A separate crew will lay out an assortment of floating and/or submerged pipelines that attach to the dredge and continue to the disposal area. The dredge will use a cutter head that is lowered to the excavation depth; the dredge will then move in a sweeping motion to remove material. Large CSDs have the ability to pump dredge material over a couple miles through pipelines. The discharge end of pipeline is tended by bulldozers and front-end loaders. Shore pipe is frequently extended to facilitate fill design. Periodic surveys will be taken to check the progress of both the dredging area and the disposal site fill.

In general, this method of dredging does not produce as much turbidity as a clamshell operation. CSD operations require an assortment of ancillary equipment to support the dredge, including a derrick barge, work boats, stiff-leg anchor barge(s), crew boats, and a fill equipment such as dozers, loaders, and often excavators. CSD operations typically occur 24 hours per day, 7 days per week.

Clamshell Dredge

Mechanical dredging uses a clamshell bucket or an excavator to remove material and either place the dredged sediments in a bottom dump hopper barge or scow. Clamshell dredging utilizes cables to raise and lower the bucket through the water column, allowing clamshell dredges to reach greater depths than a hydraulic dredge may be able to achieve. Clamshell buckets may be use-specific, such as an environmental cable arm bucket used to remove contaminated sediments while minimizing risk of contaminant migration or deposition of residuals. Material removed by mechanical means is typically transported via hopper barges or scows to the placement site where material may be bottom dumped by opening a split-hull barge or rehandled onto a wharf. Mechanical backhoe dredging with a barge mounted excavator may be most effective in relatively shallow waters and are best suited for moderately consolidated or hard-packed materials. A single clamshell dredge can remove up to 5,000 yd³ of sediment in a day when not working around piles and debris.

During dredging activities, the dredge, along with a scow, will be moved into position by tug. The dredge will use a bucket to excavate material and place it into a scow. Once the scow is full, a tug will bring an empty scow and swap it with the full scow. The tug will tow the full barge from the dredge location out to the offshore disposal area, HOODS, where the barge will bottom dump the material. Periodic surveys will be taken to check dredging progress. Besides the tugboats used for disposal operations, clamshell dredges often require an assist tug that stays with the dredge when working in

areas with high currents. It is anticipated that the clamshell dredge operations will occur 24 hours per day, 6 days per week.

Split Hull Dump Scow

Split hull dump scows are utilized by clamshell dredge operations to transport mass quantities of dredge material over the ocean. Dump scows have a massive hinge that runs through the centerline of their hulls and use hydraulic rams to open and close so that dredge material can be placed along the sea bottom at desired locations. Typical dump scow capacities range from 500 yd³ to 5,000 yd³. Dump scows are not equipped with their own propulsion and are moved by tug boats.

Derrick Barge

Derrick barges are floating platforms that require tugboats to mobilize or demobilize. The barge is modified or designed to support crawler or pedestal-mounted cranes. Derrick barges are secured into position through the use of spuds, which are usually pipe piles that can be raised and lowered into the sea floor, or through the use of anchors. Typically, a derrick barge will require a minimum of 5 to 12 feet of draft.

Derrick barges are typically configured to have longer booms for more head room (i.e., the distance from the working surface to the boom tip). They have additional winches compared to similar floating cranes like clamshell dredges. Derrick barges will be used for demolition, pile driving, heavy lifts, and wharf construction support.

Temporary Moorings

It is anticipated the dredging in Phase 1 of the terminal construction will make use of five temporary mooring buoy locations near the entrance to Humboldt Bay. The mooring buoys will be temporarily anchored to the bottom and will be capable of holding derrick barges for the purpose of storage and staging during dredging activities. Barges will be held to the mooring buoys using soft lines. Barges will either swing on a large single-point mooring or be secured in a fixed direction using a two-point mooring system.

1.8.7 Soil Improvements

The components and equipment anticipated to be used at this site will necessitate the wharf handling a load rating of 6,000 pounds per square foot (PSF) and the backlands handling 3,000 PSF. The backlands of the terminal site are required to be consolidated by preloading the site with a surcharge of soil to reduce the amount of remaining settlement expected from the future loading when the site is operational. To accelerate the required time the preload surcharge must remain in place, wick drains (or prefabricated vertical drains) will be installed to facilitate the movement of pore water out of the soil (see Section 2.7.7.3, *Soil Preloading Surcharge*).

1.8.7.1 Site Grading

The entire approximately 180 acres of the terminal site in the upland subarea, once demolished, will be elevated to provide protection against future sea-level rise and graded to provide laydown areas for the windfarm components. Soils will be compacted to sustain loads from the equipment that will move the components around. The site will be graded to provide positive drainage to the proposed

stormwater collection facilities with a minimum grade of 0.5 percent and a maximum grade of 1.5 percent¹⁰ (**Figure 16a**).

The terminal site will be raised, with elevations varying from approximately 14.3 feet up to approximately 21 feet to accommodate sea-level rise for the design life of the terminal components. The wharfs will be sloped toward the backlands at an approximately 0.5 percent slope, resulting in a slightly lower elevation than the face of the wharf to promote drainage away from Humboldt Bay. In addition, to avoid placing drainage systems in the transitional area from the wharf to the backlands, which is the high operation zone, the approximately 0.5 percent downslope will be continued for 50 to 100 feet before changing slope in the upward direction. The northern (narrower) end of the terminal site will employ a sawtooth grading pattern from east to west and gradually increase to an elevation of approximately 17 feet. The sawtooth pattern ridgelines in the north-south direction will create 1- to 2-acre drainage subareas for the collection of stormwater. The perimeter of the terminal site will have 2:1 slopes in order to avoid discharging water toward adjacent off-site properties. The southern end of the terminal site is approximately twice as wide as the northern end of the terminal site, with generally higher ground elevations. The wharf grading will match the same slopes as previously discussed. The southern end will have a similar east-west sawtooth slope but with longer runs between the slope grade breaks. As in the north, the highest elevation will be approximately 21 feet, and the perimeter of the terminal site will have 2:1 slopes to meet the existing grade.

Approximately 300,000 yd³ of material will be used to build berms within soil Surcharge Areas 1 and 2, described in Section 2.8.7.4, *Soil Preloading Surcharge*. Approximately 50,000 yd³ of surplus site material will be trucked offsite.

1.8.7.2 Cement Deep Soil Mixing and Jet Grouting

To strengthen the near-shore soil properties adjacent to the Samoa Channel and reduce lateral spreading that could undermine the wharves, either cement deep soil mixing (CDSM) or jet grouting will be used behind the near-shore slope, depending on the final design and site-specific conditions.

If CDSM is selected, the work will be performed by a specialty drilling rig that has soil mixing attachments. The auger will simultaneously drill, inject cementitious grout, and mix the soil as it gets to the required depth; it will also inject cementitious grout and mix the soil as it is extracted. The drilling rig will be supplied with water and grout from a mobile batch plant in the immediate vicinity of the work. During this process, cement replaces as much as 40 percent of the native material; this residual spoil (cementitious soil) becomes available for use on-site. Residual material may be used as backfill, surcharge, or berm material. This will be used as the first source of fill in the backlands after the soil preload surcharge operation is complete.

If jet grouting is selected, the work will be performed using a specialty drilling rig equipped with jet grouting attachments and generally follow a similar installation procedure as that for CDSM. The drill rod will advance to the required treatment depth before high-pressure cementitious grout is injected as the drill string is rotated and withdrawn to mix the grout and soil and form soil-cement columns. The drilling rig will be supplied with water and grout from a mobile batch plant in the immediate vicinity of the work. During this process, excess grout and displaced native soil will be brought to the ground surface as spoil. Jet grouting spoil typically contains a higher proportion of

¹⁰ Excluding access ramps, driveways, and perimeter cut/fill slopes.

excess grout and water, resulting in wetter, more fluid material compared to CDSM. Similar to CDSM, this residual material may be used as backfill, surcharge, or berm material. This material will be used as the first source of fill in the backlands after the soil preload surcharge operation is complete.

1.8.7.3 Wick Drains

It is anticipated that demolition of the site and some amount of site grading will have taken place prior to beginning installation of wick drains. Wick drains must be in place prior to applying soil surcharge. Wick drains are expected to be installed approximately 95 feet deep and placed in a 3.5-foot triangular pattern. As many as four wick drain installation machines will be needed to meet schedule demands early in the Project; this can be scaled back once the surcharge operation becomes the critical path. The wick drains provide a route for water to travel from the soil as it is squeezed by the weight of the surcharge mound, thereby resulting in compacted soil.

The wick drain installation operation initially requires laying out, or flagging, the wick drain locations. A wick drain installation machine will push or vibrate the wick drain into the ground. An assisting worker will then cut the wick drain and set up the machine to install the next wick drain.

Depending on the conditions of the soil on-site, the wick drain machine may experience conditions that are too hard to reach the design tip location. If this happens, a pre-drilling operation will need to occur. Pre-drilling involves using a drill mounted on an excavator or a specialty drilling rig to drill or auger the location of the wick drains and loosen the soil. If required, this operation will start prior to wicking in a given area. Drilling is slower than wick drain installation; therefore, more drill rigs will be required than wick drain installation machines to meet the construction schedule.

1.8.7.4 Soil Preloading Surcharge

The uplands at the terminal are required to be consolidated through preloading with a surcharge of soil in order to reduce the amount of settlement expected when the site is operational. Dredged material will be placed and serve as surcharge material. The preload surcharge must remain in place for 9 to 12 months in order to meet design parameters. Wick drains (or prefabricated vertical drains) will be installed to facilitate the movement of pore water up and out of the soil at the surface so that the soil may better compress. Surcharge soil could comprise reused soils from on-site dredged sediment from the adjacent marine subarea, if suitable, or imported material.

Approximately 16 to 20 ft of surcharge material will be placed on the graded surface to bring elevation to 31 to 35 ft in elevation (MLLW) and sequentially applied across the site in five distinct areas (**Figure 16c**). This sequential “rolling” of the surcharge will be necessary owing to the amount of material needed and the phasing of dredging activities (Section 2.7.8, *Dredging*). Each area will require berms that are 2 feet higher than the surcharge material; each area may have a surcharge crest that is 2 feet higher to promote drainage. It is assumed that a total of approximately 3,850,000 yd³ of surcharge will be required (**Table 11**). Once the required settlement of each surcharge is observed, the surcharge will be moved to an adjacent footprint where it will sit for another 9 to 12-months. This process will be repeated until all needed areas are consolidated. Some areas may retain a surcharge for more than a year if the initial amounts available from dredging or rolling over are unavailable during the initial surcharging.

Table 11. Approximate Volume of Surcharge for Terminal Area

Surcharge Area	Volume of Dredged Material Placed (yd ³)	Vertical Thickness of Surcharge Layer Added (ft)	Settlement Durations (months)
Area 1	970,000	16	12
Area 2	810,000	20	9
Area 3	820,000	20	9
Area 4	530,000	20	9
Area 5	720,000	20	9
Totals	3,850,000	--	--

The weight of the surcharge and length of time surcharge is left in place is designed to provide sufficient compaction to improve the stability of the ground to support the large equipment. Dredged material will be temporarily placed on land as surcharge material (preloading) and must be hydraulically pumped onto land. Prior to dredging, berms must be built to contain the dredged material in each of the surcharge areas.

During the first year of construction, berms will be built around Surcharge Area 1 and 2. The berms will be made from approximately 300,000 yd³ of onsite soil and built to of 33 ft MLLW and 37 ft MLLW, respectively, for Area 1 and Area 2. Berm construction is estimated to take approximately 3 months and to start in the first quarter of Year 1. Then approximately 970,000 yd³ of dredged material (~16 ft thick layer) will be hydraulically pumped onto Area 1 to bring surface elevation to +31 ft MLLW. This material is anticipated to be dredged with a cutter suction dredge (CSD) operating within the approach dredge area shown in **Figure 16c**. The surcharge will remain in place for 12 months. At the end of settlement, the site will have compressed (lowered in elevation) by 2 to 3 ft. A portion of the surcharge will remain to meet elevation design needs.

During the second year of construction, approximately 810,000 yd³ of dredged material (~20 ft thick layer) will be hydraulically pumped onto Area 2 to bring surface elevation to +35 ft MLLW. This material is anticipated to be dredged with a CSD operating within the approach dredge area shown in **Figure 16c**. The surcharge will remain in place for 9 months. As Surcharge Area 1 reaches the end of its surcharge period, approximately 780,000 yd³ of the surcharge layer will be rehandled with land equipment (i.e., rolled) to Area 3 (**Table 11**). The sequence continues each year until each area has settled and is meeting the compaction needs for the terminal design. Surcharge material from Area 2 will be rolled to Area 4 then surcharge material from Area 3 will be rolled to Area 5. When no more dredged material is needed for surcharge, the material will be rehandled to the Samoa Beach for beneficial use as beach nourishment or other beneficial uses.

A summary of the surcharge volume needed, the anticipated material needed to stay on site after settlement and the duration of settlement is provided in **Table 12**.

Table 12. Surcharge Plan by Area

Surcharge Area	Surcharge Volume (yd ³)	Volume to Remain in Area after Settlement (yd ³)	Volume of Surcharge to be Removed after Settlement
Area 1	970,000	190,000	780,000
Area 2	810,000	150,000	660,000

Surcharge Area	Surcharge Volume (yd ³)	Volume to Remain in Area after Settlement (yd ³)	Volume of Surcharge to be Removed after Settlement
Area 3	820,000	150,000	670,000
Area 4	530,000	100,000	430,000
Area 5	720,000	130,000	590,000
Totals	3,850,000	720,000	3,130,000

1.8.7.5 Dense-Grade Aggregate

Dense-grade aggregate (DGA) ground cover (base) is a cost-effective solution to meet the site uses and design needs of 3,000 PSF when compared to alternative cover materials roller-compacted concrete or reinforced-steel concrete. Typically, a 3-foot section of DGA is required for the soil to accept a 3,000 PSF loading. However, it is likely that this can be reduced to less than 3 feet, depending on comprehensive geotechnical data collection and detailed analysis. Any reduced amount of DGA in the backlands would be replaced with surcharge material in order to meet final grade elevations (**Figure 16a**).

DGA material may be delivered by truck or by barge. Barge delivery will most likely include offloading with a conveyor system, which may be more efficient than trucking, especially if the material can be loaded onto the barge directly from a waterfront quarry barge.

Based on an anticipated 3-foot profile of DGA, up to approximately 48,300 yd³ of DGA will be needed during Phase 0 of terminal construction to build access roads to the site. It will not be needed on-site again until after site preparation of the backlands during Phase 1, which will be approximately 6 years following the conclusion of Phase 0. Due to the lack of constructed wharfs in Phase 0, Phase 0 DGA will likely be brought to the site by truck from a local source. The larger quantity of DGA used for the wharf and backlands will most likely be supplied by a waterfront quarry and barges. This volume is estimated to be approximately 685,300 yd³ in Phase 1 and 137,400 yd³ in Phase 2, for a total of 871,000 yd³ of DGA in Phases 0, 1, and 2. In addition, as seen in other wind terminals where DGA is used as a base, there will be some amount of localized settling in areas of long-term storage and along the routes where components are moved. These localized areas will require filling with additional DGA as a maintenance action during Phase 1 and 2 of construction.

1.8.8 Slope Stabilization

1.8.8.1 Shoreline Stabilization

A rock revetment will be constructed to provide protection from erosion along the shoreline at the terminal. Revetment typology is currently used at the site, is easy to maintain and adapt to sea-level rise, and is the most common shoreline treatment for working ports. Replacing the existing scattered rock and debris shore protection with clean rock in a more compact footprint can also provide a benefit to the bay ecosystem.

The rock revetment will require a 4-foot-thick section at a 2H:1V slope. The rock revetment is the simplest structure to construct for slope protection. The sloped nature of the revetment requires placing rock below the high-tide line (**Figure 19**).

The rock revetment will be constructed either by land-based or barge-based equipment. The shoreline will be graded prior to installation of shoreline protection rock. Periodic surveys will be performed to confirm grades are met.

1.8.8.2 Dredge Slope Stabilization

In addition to shoreline rock revetments, rock will also be placed along dredged slopes under and adjacent to the wharves to stabilize those slopes; it will extend up to the shoreline in some areas (**Figure 19**). Rock will be brought to the Project site by a material barge loaded at an off-site quarry and tended by a tugboat. The material barge will be moored to a floating crane, which will be positioned such that stone can be pushed off the side of the material barge using a loader at the desired location. More precise placement of rock to fill low points, or when getting close to design thickness, will be accomplished with a floating crane using a rock tub. The rock tub is loaded by the loader on the material barge; the crane will hold the rock tub over the location where it intends to dump the rock and tilt the bucket to dump the rock. Periodic surveys will be performed to confirm grades are met.

1.8.9 Wharf and Mooring Dolphine Construction

Wharf construction will include construction of the following structures:

- North and south marginal wharves.
- Near-shore mooring dolphins.

The structures will comprise reinforced-concrete decks supported by steel pipe piles. The wharves will be located above the shoreline slopes of the dredged berthing area. The near-shore mooring dolphins will be located at the southern ends of the respective wharves; they may be situated either within the dredged berthing area or along adjacent side slopes, depending on the final layout and berth geometry. **Table 13** provides a summary of the wharf components.

Table 13. Summary of Wharf Components

Component	Width (feet)	Length (feet)	Depth of the Deck(feet)	Pile Size (inches)	Number of Piles
North Wharf	150	1,700	3	36 × 1	1,200
				36 × 1.5	755
North Side Mooring Dolphins	40	40	3	36 × 1.5	30
South Wharf	150	1,800	3	36 × 1	1,260
				36 × 1.5	800
South Side Mooring Dolphins	40	40	3	36 × 1.5	30
Total					4,075

1.8.9.1 Pile Driving

Pile driving will occur once all dredged-slope stabilization material is in place to avoid any damage to the piles, which could occur if rock were placed around an existing pile. In addition, access to the slope to place rock and perform quality control surveys will be hindered if the piles were already in place. Depending on the size and reach of the water-based crane, a portion of the pile rows will be installed from the water using a derrick barge for wharf construction, while the remaining landward piles will be installed using a land-based crane. It is anticipated that all piles will consist of open-ended steel pipe piles. Pile installation will begin with a vibratory hammer for positioning and initial driving, followed by an impact hammer to achieve designated capacity.

Pile driving within a specific location and inclination tolerances require the use of templates to guide and control the pile during installation. Templates can take many forms; however, a common arrangement consists of horizontal steel beams welded together to create slots or guides that maintain pile alignment during driving. These templates may be secured to previously installed piles or temporary piles. The crane may also use driving leads attached to a fixed point as a template. The leads can be secured in several ways, with the preferred method being a “spotter,” which is a hydraulic ram connected between the leads and the crane. Alternatively, the bottom of the leads can be connected directly to a fixed point.

A vibratory hammer will be used for the initial driving of the pile. The vibratory hammer clamps onto the pile and oscillates at a high speed. The oscillation causes the soil around the pile to vibrate and liquefy, reducing resistance. As a result, the weight of the pile will advance it downward. Once the pile can no longer advance, or is within approximately 10 feet of the design-tip depth, an impact hammer will be used to complete the installation. The impact hammer is required to seat the pile and confirm achieved capacity.

Pile Installation Phasing

- North Wharf – Phase 1: Installation of approximately 1,950 steel pipe piles (1,350 in water, 600 on land) measuring 175 feet long and having a diameter of 36 inches.
 - The berthing and mooring dolphins will require approximately thirty 200-foot-long, 36-inch-diameter steel pipe piles in water.
- South Wharf – Phase 1: Installation of approximately 745 steel pipe piles (515 in water and 230 on land) measuring 175 feet long and having a diameter of 36 inches.
 - The berthing and mooring dolphins will require approximately thirty 200-foot-long, 36-inch-diameter steel pipe piles in water.
- South Wharf—Phase 2: Installation of approximately 1,320 steel pipe piles (915 in water and 405 on land) measuring 175 feet long and having a diameter of 36 inches.

In total, approximately 4,075 piles will be installed (2,840 in water and 1,235 on land).

Pile Installation Timing

Pile driving may be conducted simultaneously or in sequence. If simultaneous, two waterside pile-driving rigs and one landside pile-driving rig could work on wharf structures while a fourth could be

working on one of the wet storage mooring structures. Simultaneous pile driving may be necessary when constrained to in-water work windows.

1.8.9.2 Wharf Deck Construction

Once piles are driven to the full width of the wharf for a given length of wharf, falsework will be installed on the piles by a water-based crew using work boats and work floats to gain access to the piles. Falsework is a temporary supporting structure that attaches to the piles and is designed to hold the weight of forms, rebar, concrete, and other construction-related live loads. It is typically made up of friction collars, which are beams that are squeezed onto the piles with enough force to support a vertical load. Steel beams are then placed from collar to collar. Alternatively, a hanging support could be attached to the pile on which a steel beam will rest.

A crane will assist by holding the falsework in position while the crew erects the falsework. The crane can be either land- or water-based. Formwork is then placed on top of the falsework by the same assist crane to create the form of the concrete pour. Formwork is typically made of wood beams that span between the falsework steel beams and is topped with specialty plywood that has a smooth surface, making it is less likely to bond to concrete so it can be used multiple times. The contractor may also choose to use reusable forms, which are modular and made of steel.

Once the formwork is installed, rebar will be installed as well as any embedded items such as utility conduits (water, electrical) and vaults, bolts, and anchors. Once all embedded items are installed, concrete for the main deck will be poured. Concrete pour lengths are limited by the amount of concrete that can be poured and finished as well as the curing methods implemented in a work shift. The main wharf is 150 feet wide and 3 feet deep; therefore, the length of the pours will most likely span four to six bents, for an approximate pour length of 50 to 80 feet per pour. The concrete will be placed using a concrete pump truck that can reach all areas of the concrete pour. The pump truck will be positioned on the landside of the wharf and supplied by a continuous supply of concrete from concrete mixer trucks.

Once the concrete reaches sufficient strength and curing is complete (approximately 28 days), the falsework and formwork will be removed by a water-based crew in work boats and work floats with the assistance of a crane. Once the falsework and formwork are dropped, they will be rehandled into the backlands to be reused or demobilized once all pours are complete.

The main deck will be poured separately from deeper sections of the wharf (such as the waterside beam) as well as areas where the concrete is above the elevation of the main deck pour (such as any curbs) or any embeds that have critical elevation requirements such as vaults. These areas will be poured separately for ease of construction and happen after the main deck pour has cured and falsework and formwork has been removed. Concrete trucks will be able to drive directly onto the new wharf deck for access to pour the secondary concrete.

Once the secondary pours are completed, the bollards and fenders will be installed with either a small mobile crane or forklift that can drive directly onto the new wharf deck.

1.8.10 Demobilization

This activity consists of demobilizing the contractor's workforce and equipment from the worksite and staging areas. This includes all activities for transport of the contractor's personnel, equipment,

and operating supplies off of the site, including temporary offices and other general facilities the contractor may have installed. The contractor is responsible for cleaning up and restoring all work areas prior to demobilizing. The staging areas will be restored to their original condition, or finished design conditions, unless required otherwise. All waste, contaminants, temporary works, excess materials, and facilities will be removed.

Land-based equipment will be demobilized by trucks. Some larger equipment, such as crawler cranes, will require multiple truck loads and multiple days to disassemble. Some of these large loads will require special permits and coordination with local authorities if the load is too wide, too long, or too heavy per regulations.

Water-based equipment will be demobilized in the same fashion that it was mobilized to the site. Water-based access, staging, laydown and mooring areas will be removed and restored to their original condition.

1.8.11 Construction Staffing

The size of the construction workforce will fluctuate throughout the duration of the construction of the Project's terminal. The average workforce will be 90 personnel, with up to 165 personnel during the peak for Phases 0 and 1. Phase 2 will have, on average, 45 personnel and up to 115 personnel when utilities are being installed. The numbers include the contractor team, Construction Management Team (CMT), highly skilled trades, journeymen, and laborers.

The labor demand will initially be focused on water-based demolition, backlands demolition, and dredging. The labor will increase to include earthwork and wick drain operations. This will remain constant for the first 18 to 24 months, at which point additional labor will be required to construct the wharves, utilities, and buildings.

The construction workforce will be resourced primarily from the local labor market, except for specialized individuals furnished directly by the contractor(s). It is anticipated that these specialized individuals will find local housing for the duration of their part of construction. Therefore, there will be no requirement for a labor camp to be set up for the construction.

1.8.12 Best Management Practices

For erosion and sedimentation, BMPs are defined within the Construction General Permit (CGP), Order No. 2022-57-DWQ, NPDES No. CAS000002. The CGP regulates stormwater and non-stormwater discharges associated with construction activities disturbing 1 acre or more of soil. A Project-specific Stormwater Pollution Prevention Plan (SWPPP) will be prepared and implemented consistently with the requirements of the CGP. The contractor will develop the SWPPP for the Project site and implement identified BMPs. Common BMPs included in a SWPPP involve reducing erosion of the stock piles; covering metal stockpiles; installing oil containment around equipment that uses fuel, oil, or grease; and filtering runoff into storm water systems. Construction activities at the Project site would implement BMPs that include, but are not limited to, the following measures:

- Erosion controls such as geotextiles and mats, earth dikes and drainage swales, hydraulic mulch, hydroseeding, wood mulch, slope drains, and soil binders.
- Sediment controls such as street sweeping, storm drain inlet protection, and linear sediment controls, including silt fencing, fiber rolls, sandbag barriers, and gravel bag berms.

- Wind erosion controls such as wind screens or applications of water or other dust palliatives to prevent or minimize dust nuisance.

BMPs will be implemented for pile driving and wharf construction. Work would be conducted within the established in-water work window as these windows are intended to avoid periods when sensitive fish species are present in the Project area. A vibratory hammer will be used for as much of the pile driving as possible to limit the sound disturbance caused by impact hammers. When impact hammers are required to complete pile installation, soft-start procedures will be implemented to provide fish and marine mammals an opportunity to move away from the work area before full-energy pile driving begins. Potential impacts on marine mammals can be mitigated through the use of a marine mammal monitor, with pile-driving operations suspended when marine mammals are observed within designated exclusion zones.

1.9 Habitat Restoration Subarea Construction

Habitat Restoration Subarea construction will create and enhance on-site wetland and ESHA habitats. Areas will be lowered in elevation to introduce tidal influences and develop salt marsh habitat. The North Access Road for the terminal will separate the freshwater wetland area from the estuarine wetland. The freshwater wetland will be hydrologically connected to the estuarine wetland through a culvert under the access road to mimic natural salt marsh to freshwater marsh ecotones along Humboldt Bay (**Figure 13**).

Freshwater wetland creation will consist of excavating an area that is currently upland fill to suitable depths and allow the development of freshwater wetland hydrology and establishment of native hydrophytes. Estuarine wetland creation will consist of excavating an area that is currently upland fill to suitable depths to allow the development of estuarine wetland hydrology and establishment of native salt marsh vegetation adjacent to Humboldt Bay, offering direct habitat connectivity and the potential for hydrologic connectivity and creation of tidally influenced wetlands.

Coastal wetlands will be created along the perimeter of both the created estuarine and freshwater wetlands and represent the transition from three-parameter conditions to upland. Although this area will rarely have wetland hydrology, the pronounced hydrology of the adjacent wetland areas will support the deeper-rooted hydrophytes proposed for this area.

Sensitive natural community establishment and enhancement will occur in distinct locations across the entire Habitat Restoration Subarea by removing invasive species and planting with suitable palettes of native vegetation. In addition, approximately five structures for osprey nesting will be placed along the Humboldt Bay shoreline and within the vicinity of the created wetlands as part of an Osprey Management Plan to be developed for current and future nests.

Other construction activities will include the following:

- Salt marsh, freshwater wetlands, and ESHA will be planted with suitable native plant species.
- Construction of structures that will support osprey nests.

1.10 Onsite Landfill Solar Array

Construction of the proposed off-site landfill solar array will occur in two phases, consisting of earthwork and grading, along with infrastructure installation (**Figure 7**). Initial site preparation will include minor excavation and regrading the existing landfill mound crests using conventional heavy equipment (e.g., hydraulic excavators and haul trucks). Initial site preparation activities will occur over approximately 2 to 3 weeks. Following grading, a contractor will install lightweight cellular concrete (LCC) as part of the engineered cap system over the landfill. The contractor will deliver proprietary lightweight aggregate foam, transported in shipping containers, to be mixed on-site with locally sourced concrete materials. The LCC will be placed in two lifts across an area of approximately 2.5 acres, totaling approximately 4,000 yd³. Upon completion of LCC placement, a layer of aggregate base will be installed and compacted over the cap. Approximately 4,000 yd³ of aggregate base material will be placed using standard earthmoving equipment to achieve the final cap profile.

After grading and earthwork activities are completed, solar infrastructure components will then be installed. Ballast foundations will be formed and poured within a designated staging area and transported to the landfill mounds using small equipment (e.g., skid-steer loaders). Installation of the solar ballasts will occur over an additional 2- to 3-week period. Subsequent to the installation of solar infrastructure components, site drainage features and utility infrastructure will be installed. This includes construction of a concrete foundation at the base of the landfill to support electrical switchgear. Electrical improvements associated with the off-site landfill solar array will also include trenching, conduit installation, and backfilling to connect the Project to the PG&E distribution system at the point of interconnection.

1.11 Class I Bike Path Trail within the GRTA Right-of-Way

Construction of the Class I bike path trail within the GRTA right-of-way (**Figure 10**) is anticipated to take approximately 4 months and require up to 12 construction personnel per day. Construction activities associated with the trail will be required to implement both temporary and permanent erosion and sediment control BMPs, such as those described above in Section 2.7.2, *Best Management Practices*.

Construction of the trail will include site preparation, grading and excavation, and surface improvements. Construction activities within the new trail alignment will include vegetation clearing and grubbing, grading and excavation, embankment and fill placement, hauling of materials to and from the site, and jackhammering or grinding for the removal of existing materials and overall site preparation. If feasible, all vegetation clearing will occur outside of the nesting bird season. However, if not feasible, a biologist will be required to monitor and clear vegetation for removal. Following these activities, construction will also include asphalt paving along the entire trail alignment as well as the placement of concrete paving and associated structures at community access points and trailheads. Existing railroad tracks, ties, and appurtenance will be removed and relocated or disposed of where the railroad alignment is to be realigned or conflicts with trail construction. Additional improvements as part of construction of the trail will include striping and signage. Striping will be included along the entirety of the trail alignment and where needed to

modify the existing road where the trail intersects. Signage will also be added at all trail intersections, community access points, and community trailheads. Furthermore, lighting and electrical infrastructure will be incorporated at the Peninsula Union School access crosswalk.

1.12 Construction at Offsite Locations

1.12.1 Woodley Island Storage Area and Dock

Construction of the Woodley Island Storage Area and Dock is anticipated to start in 2029 and finish in 2029 as part of Phase 0 efforts. Activities include the following: demolition, pile driving, concrete deck and landside retaining wall construction, and topside equipment installation. It is anticipated that up to 20 construction personnel per day will be needed during construction.

Construction of the landside storage area will begin with the clearing and tree removal within the storage area and laying down of gravel bedding. A 15 foot by 100 foot timber carport will be constructed and an approximately 1,200 linear foot chain link fence installed around the perimeter along with a 300-foot wide chain link fence security gate. No lighting or other utilities are to be provided within the landside storage area. Landside storage may also be used as a laydown area for the remainder of construction work.

Construction of the expanded dock will begin with the removal of the out-of-service timber dock and associated components. Installation of the new structural elements will include driving thirteen 24-inch-diameter steel pipe piles to the required elevation with use of either vibratory or impact hammers, depending on soil conditions. The future design may select to utilize precast concrete piles, in which case piles will be hammer driven to tip elevation. In addition, five 13-inch-diameter composite fender piles will be needed at the face of the wharf to protect the structure and docking vessels. Piles will be transported by truck or barge to the site and then lifted and driven from a crane located on the landside or a barge crane. Fender piles will be vibrated to tip with no pile driving necessary.

Landside excavation of riprap will occur as needed to place the new landside retaining wall. Riprap that is removed will be relocated along the adjacent shoreline. Construction activities associated with the storage area and dock are not expected to remove any hazardous materials. However, testing of material for hazards will occur prior to removal; if the excavated material is found to contain hazards, it will be handled and disposed of at the appropriate landfill.

Following pile installation, formwork for cast-in-place concrete will be constructed on the landside and above the installed piles. Formwork over water will be clamped to the driven piles. Concrete reinforcement will be placed at the landside retaining wall and on the deck. The concrete deck and landside retaining wall will be poured over a 2,700 SF area to a depth of 24 inches; it is anticipated that the wet concrete will be delivered by truck and pumped. Following curing of the concrete, the formwork will be removed, and the landside retaining wall will be back filled with compacted soils and an asphalt cover. The top of the deck is intended to match the existing deck and to be approximately 12 feet above MLLW. A steel transition plate will be installed to bridge the gap between the new wharf and the existing timber pier.

As part of the final construction activities associated with the storage area and dock, additional site improvements will include the installation of railings, safety ladders, transition plates, and other miscellaneous electrical and utility hardware. Following installation of the composite fender piles, a new 5-ton davit crane with a 20-foot reach will be installed and certified. The contractor will then demobilize, and the storage area and dock will be reopened to the public.

1.12.2 Woodley Island Waterfront Recreation Center (Sailing Center)

Construction of the Woodley Island Waterfront Recreation Center (**Figure 14**) would consist of developing a new single-level pavilion structure containing up to 10,000 feet of covered space within an already developed 5.9-acre site. Existing conditions at the site include lawn, paved parking lot, and an 800 SF service building. The site is part of an existing approximately 14-acre marina complex which includes asphalt parking, open lawn and an approximately 14,000 SF of restaurant and retail space. Construction activities would include minor site preparation, excavation for foundations, installation of support columns and a roof structure, utility connections as needed, and associated improvements such as walkways, lighting, and landscaping.

1.13 Port Development Overlay Zone

The proposed Project requires development of a Port Development Overlay Zone for the terminal site on the Samoa Peninsula for the area zoned as Industrial/Coastal Dependent (MC) within the Upland Development Subarea and Habitat Restoration Subarea. The proposed terminal is permitted principally by the MC zone; however, some of the development standards for this zone require updating to accommodate the relatively unusual development needs for a heavy-lift terminal. The Port Development Overlay Zone can be used to address both coastal resource protection concerns and development regulations established by the zoning ordinance. It may also be used to address zoning regulations for structure height and lighting. The Port Overlay Zone can also be used to address situations where there is potential for ESHAs on previously developed sites.

The following Port Development Overlay Zone development standards are proposed:

- Recognize the Project as a Priority 1 site for the proposed coastal-dependent industrial use. Resolve conflicting language in relationship to other coastal act policies addressed in the HBAP and with other current uses, including policies regarding natural resources, viewsheds, and recreation.
- An area erroneously designated as NR-W by Humboldt County is within the Harbor District's primary regulatory jurisdiction and contrary to the purposes of the tidelands granted in 1970 to the Harbor District by the California State Lands Commission. This inconsistency will need to be resolved (**Figure 5a**).
- Differentiate between buildings and nonbuilding structures (e.g., cranes, high-mast lighting, and assembly of wind turbines) and increase maximum building and fixed-structure height flexibility allowances to accommodate the Project.

- Modify limitations of industrial performance standards, including: noise, lighting, vibrations, dust control, and enclosed manufacturing, to meet the needs of this Project and surrounding land uses.

1.14 Required Permits and Major Approvals

The Project will be subject to numerous federal, state, and local regulations that protect various aspects of environmental quality. More detailed information on regulatory requirements is provided in Chapter 3, *Environmental Setting and Effects of the Alternatives*. **Table 14** presents a summary of related environmental laws, approvals, permits, and/or consultations potentially required for Project implementation.

Table 14. Permit Requirements Potentially Applicable to the Project

Agency with Jurisdiction	Regulation(s)	Required Authorization
Federal		
U.S. Army Corps of Engineers (USACE)	Federal Clean Water Act (CWA), Section 404, Rivers and Harbors Act (RHA) Section 10	CWA Section 404/RHA Section 10 Individual Permit; RHA Section 14 permission; federal action also requires NEPA compliance by federal lead
USACE	RHA Section 14 (33 united states code [U.S.C.] 408)	Section 408 permission
U.S. Fish and Wildlife Service (USFWS)	Federal Endangered Species Act (ESA), Section 7	Potential need for take authorization will be determined through federal lead consultation with USFWS
USFWS	Migratory Bird Treaty Act (MBTA)	Potential need for take authorization will be determined through Harbor District or federal lead consultation with USFWS
USFWS	Bald and Golden Eagle Protection Act (BGEPA)	Potential need for take authorization will be determined through Harbor District or federal lead consultation with USFWS
National Marine Fisheries Service (NMFS)	Federal ESA, Section 7	Potential need for take authorization will be determined through federal lead consultation with NMFS
NMFS	Magnuson–Stevens Fishery Conservation and Management Act Essential Fish Habitat (EFH)	Potential need for EFH consultation will be determined through federal lead coordination with NMFS
NMFS	Incidental Harassment Authorization (IHA)	Potential need for IHA will be determined through Harbor

Agency with Jurisdiction	Regulation(s)	Required Authorization
District or federal lead consultation with NMFS		
State		
North Coast Regional Water Quality Control Board (RWQCB)	Federal CWA, Sections 401; Porter-Cologne Water Quality Control Act, California Water Code Section 13200 et seq.	Section 401 Water Quality Certification (WQC); Waste Discharge Requirements (WDRs)
RWQCB	Federal CWA, Section 402	National Pollutant Discharge Elimination System (NPDES) permit
RWQCB	State Water Resources Control Board (SWRCB) Statewide Construction General Permit Order WQ 2022-0057-DWQ/NPDES No. CAS000002	Obtain coverage under existing Construction General Permit
RWQCB	SWRCB Statewide General Permit for Stormwater Discharges Associated with Industrial Activities, Order 2014-0057-DWQ (Industrial General Permit)	Obtain coverage under existing Industrial General Permit
California Department of Fish and Wildlife (CDFW)	California Endangered Species Act (CESA)	Incidental Take Permit (ITP)
California Coastal Commission (CCC) and County of Humboldt	California Code of Regulations (CCR), Sections 30600 et seq. and 13000 et seq.; Coastal Zone Management Act (CZMA), Section 307	Consolidated Coastal Development Permit (Consolidated CDP) and CZMA Consistency Determination
State Historic Preservation Office (SHPO)	National Historic Preservation Act (NHPA), Section 106	Potential need for Section 106 consultation will be determined through federal lead coordination with the State Historic Preservation Office (SHPO)
Local		
County of Humboldt	Humboldt County Code	Use Permit(s) for grading and building and port overlay zone
Humboldt Bay Harbor, Recreation, and Conservation District	Humboldt Bay Harbor, Recreation, and Conservation District Act, Sections 23 and 24	Development Permit
City of Eureka	Eureka Municipal Code, Section 155.412.120	Conditional Use Permit
City of Arcata	Arcata Land Use Code, Section 9.72.080	Conditional Use Permit