ADMINISTRATIVE DRAFT

HUMBOLDT BAY OFFSHORE WIND HEAVY LIFT MARINE TERMINAL PROJECT INITIAL STUDY

PREPARED FOR:

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ICF

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Acronyms and Abbreviations

Acronym	Definition
°C	Celsius
°F	Fahrenheit
µg/m3	micrograms per cubic m
ADUs	Accessory dwelling units
AE	Agriculture Exclusive
ALUCP	Airport Land Use Compatibility Plans
APE	Area of Potential Effect
AST	aboveground diesel storage tanks
ASTM	American Society for Testing and Materials
bgs	below ground surface
BLM	Bureau of Land Management
BMPs	best management practices
CAAQS	California Ambient Air Quality Standards
CAL FIRE	California Department of Forestry and Fire Protection's
Cal OSHA	California Division of Occupational Safety and Health
Cal/EPA	California Environmental Protection Agency
CALFIRE	California Department of Forestry and Fire Protection
CARB	California Air Resources Board
CBC	California Building Code
CCA	California Coastal Act
CCC	California Coastal Commission
CCH	Consortium of California Herbaria
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CDI	coastal dependent industry
CDP	Coastal Development Permit
CEMP	California Eelgrass Mitigation Policy
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESA	California Endangered Species Act
CFGC	California Fish and Game Code
CFR	Code of Federal Regulations
CGS	California Geological Survey
CH4	methane
CHP	California Highway Patrol
cKVs	Candidate KVs
CLUPS	Coastal Land Use Policies and Standards
cm	centimeters
CMPs	Comprehensive Management Plans
CMT	Construction Management Team
CNDDB	California Natural Diversity Database

Acronym	Definition
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
Construction General Permit	Construction and Land Disturbance Activities
CPT	cone penetrometer test
CRHR	California Register of Historic Resources
CRPR	California Rare Plant Rank
CSZ	Cascadia Subduction Zone
CWA	Clean Water Act
CWHR	California Wildlife Habitats Relationships
CWPP	Community Wildfire Protection Plans
cy	cubic yards
CZMA	Coastal Zone Management Act
CZMP	Coastal Zone Management Program
DFW	Department of Fish and Wildlife
District	Humboldt Bay Harbor, Recreation, and Conservation District
DMMO	Dredge Material Management Office
DOT	Department of Transportation
DPM	diesel particulate matter
DTSC	Department of Toxic Substances Control
EEZ	U.S. Exclusive Economic Zone
EFH	Essential Fish Habitat
EIR	Environmental Impact Report
EOC	Emergency Operations Center
EOP	Emergency Operations Plan
EPA	U.S. Environmental Protection Agency
ESA	Environmental Site Assessment
ESHA	Environmentally Sensitive Habitat Areas
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FHSZ	Fire Hazard Severity Zones
FMMP	Farmland Mapping and Monitoring Program
FMPs	fishery management plans
FPA	Forest Practice Act
FRAP	Fire and Resource Assessment Program
FSZ	Farmland Security Zone
ft	feet
GIS	geographic information system
GWh	gigawatt-hours
GWP	global warming potential
HAA	Housing Accountability Act
HAPC	Habitat Area of Particular Concern
HBAP	Humboldt Bay Area Plan

Acronym	Definition
HBHRCD	Humboldt Bay Harbor Recreation and Conservation District
HCA	Housing Crisis Act of 2019
HCDEH	Humboldt County Division of Environmental Health
HCGP	Humboldt County General Plan
HCOES	Humboldt County Office of Emergency Services
HOODS	Humboldt Open Ocean Disposal Site
HRA	health risk assessment
HSC	Health and Safety Code
IPCC	Intergovernmental Panel on Climate Change
km	kilometers
KVs	key views
LCP	Local Coastal Program
LHMP	Local Hazard Mitigation Plan
LTOs	Licensed Timber Operators
m	meters
MBTA	Migratory Bird Treaty Act
MHHW	Mean Higher High Water
MLLW	mean lower low water
mm	millimeter
MMPA	Marine Mammal Protection Act
MRMHMP	Mineral Resources and Mineral Hazards Mapping Program
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MW	magnitude
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NCAB	North Coast Air Basin
NCCP	Natural Community Conservation Plan
NCP	National Contingency Plan
NCRWQCB	North Coast Regional Water Quality Control Board
NHPA	National Historic Preservation Act
NO	nitric oxide
NO_2	nitrogen dioxide
NOA	naturally occurring asbestos
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPPA	Native Plant Protection Act
NR	Natural Resources
NRCS	U.S. Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWIC	Northwest Information Center
O_3	Ozone
OA	Operational Area
OES	Office of Emergency Services
OHP	Office of Historic Preservation

Acronym	Definition
OHV	Off-Highway Vehicle
OLE	Operating Level Earthquake
OSHA	Occupational Safety and Health Administration
OTM	Ocean Testing Manual
PCBs	Polychlorinated biphenyls
PCSD	Peninsula Community Services District
PEIR	Project Environmental Impact Report
PFMC	Pacific Fishery Management Council
PGA	peak ground acceleration
PM	Particulate matter
ppm	part per million
PRC	Public Resources Code
PSA	Permit Streamlining Act
QSD	Qualified SWPPP Developer
RCRA	Resource Conservation and Recovery Act of 1976
RECs	recognized environmental conditions
Regional Water Boards	regional water quality control boards
RHNA	Regional Housing Needs Assessment
ROG	reactive organic gases
RPFs	Registered Professional Foresters
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SCSD	Samoa and Fairhaven.
SDBL	State Density Bonus Law
sDPS	southern DPS
SGMCP	soil and groundwater management contingency plan
SHPO	State Historic Preservation Officer
SLCP	short-lived climate pollutants
SMARA	Surface Mining and Reclamation Act
SMR	salt marsh restoration
SO_2	sulfur dioxide
SONCC	Southern Oregon-Northern Coastal California
STMP	Samoa Town Master Plan
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TACs	toxic air contaminants
TCRs	tribal cultural resources
THP	Timber Harvesting Plan
THPO	Tribal Historic Preservation Officer
TNW	Traditional Navigable Waterways
TPZ	Timberland Production Zone
UBC	Uniform Building Code
ug/L	micrograms per Liter
USACE	U.S. Army Corps of Engineers

Acronym	Definition
USDA	United States Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U. S. Geological Survey
UST	underground storage tank
WDR	Waste Discharge Requirements
WDRs	waste discharge requirements
WHSRN	Western Hemisphere Shorebird Reserve Network

Chapter 1
Introduction

Disclaimer: This draft technical memorandum is a work-in-progress and is intended to be an internal document for use by the Humboldt Bay Offshore Wind Heavy Lift Marine Terminal Project team as a part of the conceptual design process and the ongoing permitting process. This memorandum is meant to be read as a part of a comprehensive packet of technical analyses. It is not written to be a standalone document, and it is assumed that the reader has substantial project knowledge and context to understand the memorandum's content. All aspects of this memorandum are subject to change and may become less accurate over time. To better understand the project, please review the more comprehensive and up-to-date documents posted to the Humboldt Bay Harbor District's website at https://humboldtbay.org/humboldt-bay-offshore-wind-heavy-lift-marine-terminal-project-3.

The Humboldt Bay Harbor, Recreation and Conservation District (District) will be the Lead Agency and will prepare an Environmental Impact Report (EIR) for the Humboldt Bay Offshore Wind Heavy Lift Marine Terminal Project (Project). The EIR will identify, evaluate and disclose possible environmental effects of the Project. The District is the project proponent and the California Environmental Quality Act (CEQA) Lead Agency.

The objectives of this Initial Study are to:

1. Identify topics that will be addressed in the EIR.
2. Identify special studies that will be required to inform the EIR.
3. Provide project description and environmental setting information for use in the EIR.

Because environmental impact analysis has not been completed, and mitigation measures have not yet been identified, topics in this Initial Study are identified as *No Impact* or *Less than Significant* impact if the relevant resources could not be affected by the Project. All other topics that will be evaluated in the EIR are identified as *Potentially Significant*.

1. **Lead Agency Name and Address:** Humboldt Bay Harbor, Recreation and Conservation District
2. **Contact Person and Phone Number:** Rob Holmlund, (707) 443-0801
3. **Project Location:** Eureka, CA
4. **Project Sponsor's Name and Address:** Humboldt Bay Harbor, Recreation and Conservation District
5. **General Plan Designation:** Coastal Dependent Industrial, General Industrial, Natural Resources
6. **Zoning:** Coastal Dependent Industrial, General Industrial, Natural Resources
7. **Description of Project:**

   See Appendix A.
8. **Surrounding Land Uses and Setting:**

   Land surrounding the Project site is primarily industrial and residential. The Pacific Ocean and beaches are to the west and Humboldt Bay is to the east.
9. **Other Public Agencies Whose Approval is Required:**
10. **Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code Section 21080.3.1? If so, is there a plan for consultation that includes, for example, the determination of significance of impacts to tribal cultural resources, procedures regarding confidentiality, etc.?**

    Yes, consultation is currently underway with Tribes that requested consultation.

Environmental Factors Potentially Affected

The environmental factors checked below would potentially be affected by this project (i.e., the project would involve at least one impact that is a "Potentially Significant Impact"), as indicated by the checklist on the following pages.

☒ Aesthetics	☒ Agricultural and Forestry Resources	☒ Air Quality
☒ Biological Resources	☒ Cultural Resources	☒ Energy
☒ Geology/Soils/ Paleontological Resources	☒ Greenhouse Gas Emissions	☒ Hazards and Hazardous Materials
☒ Hydrology/Water Quality	☒ Land Use/Planning	☐ Mineral Resources
☒ Noise	☒ Population/Housing	☒ Public Services
☒ Recreation	☒ Transportation	☒ Tribal Cultural Resources
☒ Utilities/Service Systems	☒ Wildfire	☒ Mandatory Findings of Significance

Determination

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions to the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have an impact on the environment that is "potentially significant" or "potentially significant unless mitigated" but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards and (2) has been addressed by mitigation measures based on the earlier analysis, as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the project, nothing further is required.

Signature	Date
Printed Name	For

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Chapter 2
Evaluation of Environmental Impacts

1. A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained if it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
2. All answers must take account of the whole action involved, including offsite as well as onsite, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
3. Once the lead agency has determined that a particular physical impact may occur, the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an Environmental Impact Report (EIR) is required.
4. "Negative Declaration: Less than Significant with Mitigation Incorporated" applies when the incorporation of mitigation measures has reduced an effect from a "Potentially Significant Impact" to a "Less-than-Significant Impact." The lead agency must describe the mitigation measures and briefly explain how they reduce the effect to a less-than-significant level. (Mitigation measures from *Earlier Analyses*, as described in #5 below, may be cross-referenced.)
5. Earlier analyses may be used if, pursuant to tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration (Section 15063(c)(3)(D)). In this case, a brief discussion should identify the following:
    a. Earlier Analysis Used. Identify and state where earlier analyses are available for review.
    b. Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards and state whether such effects were addressed by mitigation measures based on the earlier analysis.
    c. Mitigation Measures. For effects that are "Less than Significant with Mitigation Incorporated," describe the mitigation measures that were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.
6. Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, when appropriate, include a reference to the page or pages where the statement is substantiated.
7. Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.
8. This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.
9. The explanation of each issue should identify:

a. the significance criteria or threshold, if any, used to evaluate each question; and
b. the mitigation measure identified, if any, to reduce the impact to a less-than-significant level.

I. Aesthetics

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Except as provided in Public Resources Code Section 21099, would the project:					
a.	Have a substantial adverse effect on a scenic vista?	☒	☐	☐	☐
b.	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings along a scenic highway?	☐	☐	☐	☒
c.	In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☒	☐	☐	☐
d.	Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?	☒	☐	☐	☐

Affected Environment

Study Area

The aesthetic resources study area is defined by the area in which impacts on visual or aesthetic resources may occur. The overall study area for the Project, as described in Chapter 1, *Introduction*, consists of the ~180-acre site on the Samoa Peninsula. The aesthetic resources study area (referred to simply as study area for the rest of this chapter) is determined by evaluating the footprint and height of aboveground project facilities, and their visibility, within the landscape. Because the proposed Project include features that are very tall, the study area is quite broad and directly correlates to the potential area of aesthetic impact. Therefore, the study area for this resource hosts a variety of land cover and vegetative communities such as open water, beaches and sand dunes, marshes, wetlands and aquatic vegetation, agriculture, grasslands, and urban and rural development.

The study area was determined by conducting a geographic information system (GIS)-based viewshed analysis to identify areas from which the Project has the potential to be seen. To conduct the viewshed analysis, points were assigned to the various features associated with the Project. These points were assigned heights corresponding to the heights of features provided by the Project designer. The viewshed analysis factors the surrounding terrain, but it does not factor vegetation or building heights. To be conservative, the viewshed analysis considers views up to 5 miles away from the Project. The final GIS viewshed analysis is shown in Figure A.

For the purpose of this IS, the analysis is focused on foreground views that are a 0.5-mile radius from the Project features and middleground views that are up to 5 miles from the Project features. Background views (i.e., views beyond 5 miles from the Project features) are evaluated but not considered in as much detail as foreground and background views because details become diminished beyond the middleground. Typically, Project features do not stand out in background views. However, features that are present within background views may be discussed as contributing visual elements to the study area (e.g., mountain ranges, water features) because Project features may affect the availability of views of notable features in the background, which may be of local or regional importance.

Concepts and Terminology

Below are descriptions and definitions of key terms used throughout the aesthetic resource's evaluation.

1. **Aesthetic (or visual) resources** are all objects (natural and built, moving and stationary) and features (e.g., landforms and waterbodies) visible on a landscape that contribute to the public's experience and appreciation of the environment. Aesthetic and visual resources impacts are assessed by evaluating the visual character and visual quality of the resources that comprise the project environment before and after construction of a proposed project and how these changes affect the surrounding natural and built environments. Depending on the extent to which a project's presence would alter the perceived visual quality of the environment within the aesthetic resources study area, a visual or aesthetic impact may occur.
2. ***Visual character*** includes attributes such as form, line, color, and texture and is used to describe, not evaluate, the visual environment; that is, these attributes are neither considered good nor bad. The visual character of a project study area can be defined by the natural, cultural, and project environments that constitute the study area. For the purpose of defining aesthetic and visual resources, the ***natural environment*** is determined by the visual character of the land, water, vegetation, animals, and atmospheric conditions. The ***built environment***, or built environment, is determined by the visual character of buildings, infrastructure, structures, and other artifacts and art. The ***project site environment*** focuses down from the larger context of the natural and built environments and concentrates directly on the project feature.
3. ***Visual quality*** is used to describe what viewers like and dislike about the aesthetic resources that compose a particular scene and is expressed in terms of *natural harmony*, *cultural order*, and *project site coherence*. The value placed on aesthetic resources correlates to whether those resources meet the viewer's preferred concepts of natural harmony and cultural order. The more visual preferences and expectations are met by the landscape composition, the more that landscape is revered for its views and the more memorable, or vivid, it becomes. Visual features do not intrude but belong to a landscape of a harmonious nature in an orderly society.
4. ***Natural harmony*** is based on the idea that the natural environment creates a sense of natural harmony in people. The visual character of the natural environment's aesthetic resources and viewer preferences affect the perception of natural harmony, and the viewers inherently evaluate and determine if the composition is harmonious or inharmonious.
5. ***Cultural order*** is based on the idea that the built environment creates a sense of cultural order in people. The visual character of the built environment's aesthetic resources and viewer preferences affect the perception of order, and the viewers inherently evaluate and determine if the composition is orderly or disorderly.

6. ***Project site coherence*** is created by the visual character of the project environment in combination with viewer preferences. Viewers consciously or unconsciously evaluate the composition of the landscape and determine if it is coherent or incoherent. For existing conditions, this establishes how well the project features fit in with, or how consistent the project features are with, the general area surrounding the project features (i.e., how compatible the project features are with the surrounding natural and built environments).
7. A ***viewshed*** is defined by what people can see in the landscape (e.g., an area of land, water, or other urban or environmental element) from a fixed vantage point. As mentioned above in the discussion of the Study Area, viewsheds are confined by the physical constraints of the environment and the physiological limits of human sight.

Physical constraints of the environment include landform, land cover, and atmospheric conditions. Landform can limit views or provide an elevated perspective for viewers. Similarly, land cover, such as trees and buildings, can limit views, while low-growing vegetation and the absence of structures can allow unobscured views. Atmospheric conditions, such as smoke, dust, fog, or precipitation, can temporarily reduce visibility or be a more regular component of the visual landscape.

The physiological limits of human sight are affected by location, proximity, and light. Location refers to the topographic position of the viewer, such as being level with, above, or below what is being observed. Proximity is categorized into three ***distance zones*** based off of the position of the viewer and are measured from one static point: ***foreground*** (up to 0.5 mile from the viewer), ***middleground*** (0.5 mile to 3 miles from the viewer), and ***background*** (beyond 3 miles from the viewer). Generally, the closer a resource is to the viewer, the more dominant it is and the greater its importance to the viewer, whereas importance and dominance are reduced the farther away the feature is from the viewer. In the background, the scale and color of existing landscape elements and project features blend so that only broad forms, large-scale patterns, and muted colors are evident. Light also plays a large role in affecting views. For example, during the daytime, views are more readily available than at night, when darkness conceals details and color in the landscape in the absence of bright moonlight or artificial light sources. Furthermore, light level and direction change throughout the day, affecting color and individual forms.

These limitations combine to establish viewsheds that range from restrictive to expansive (Federal Highway Administration 2015:4-5–4-9, 6-3–6-4; Litton 1968:3–5).

1. ***Light*** is a function of natural and artificial illumination that is present during the day and night within the natural, cultural, and project environments. Sources of natural light include the sun, moon, stars, fire, and lightening, and sources of artificial light include streetlights, vehicle headlights, landscape lighting, external security lighting, internal building lighting, and stadium/playing field lighting. Levels of light are influenced by the time of day, atmospheric conditions, the presence or absence of both natural and artificial lighting, and natural and built features that may filter or screen light. The visual landscape can range from very brightly lit to very dimly lit to dark and not lit at all. In addition, lighting is influenced by the color temperature of the light source that can give the appearance of warmer, more orange lighting or brighter, more blueish or whitish lighting. The height and angle of lighting and presence or absence of shielding affects whether or not lighting spills beyond a specific boundary, creating light trespass, or radiates upward into the night sky, creating ambient light glow, which brightens the night sky.

2. ***Glare*** can be caused by a direct light source (direct glare) or, more commonly, by the reflection of the sun, moon, or artificial light source from a reflective surface (reflective glare). The intensity of direct glare is a function of the brightness of the surroundings and the intensity of the light source. Similarly, the intensity of reflective glare is a function of the reflectivity of the surface, the intensity of the light source, and the angle of the light source hitting the reflective surface. Highly reflective surfaces include water, glass, and metal. However, any surface may be a source of reflective glare based on its coloring and size. Lighter surfaces are more reflective than darker surfaces. For example, flat white has a reflectivity of 85% to 95%, whereas yellow has a reflectivity of 70%. Reflectivity decreases as the color gets darker because lighter colors reflect light and darker colors absorb light. Similarly, larger surfaces have a bigger area from which light reflects than do smaller surfaces (Smardon et al. 1986:126–128).
3. ***Viewer response*** is a measure or prediction of the viewer's reaction to the visual environment and has two dimensions, *viewer exposure* and *viewer sensitivity*.
4. ***Viewer exposure*** is a measure of the viewer's ability to see a particular object. Viewer exposure has three attributes: *location*, *quantity*, and *duration*. ***Location*** relates to the position of the viewer in relationship to the object being viewed. The closer the viewer is to the object, the more exposure. ***Quantity*** refers to how many people see the object. The more people who can see an object or the greater frequency an object is seen, the more exposure the object has to viewers. ***Duration*** refers to how long a viewer is able to keep an object in view. The longer an object can be kept in view, the more exposure.
5. ***Viewer sensitivity*** is a measure of the viewer's recognition of a particular object. It has three attributes: *activity*, *awareness*, and *local values*. ***Activity*** relates to the preoccupation of viewers—are they preoccupied, thinking of something else, or are they truly engaged in observing their surroundings. The more they are actually observing their surroundings, the more sensitivity viewers will have of changes to aesthetic resources. ***Awareness*** relates to the focus of view—the focus is wide and the view general or the focus is narrow and the view specific. The more specific the awareness, the more sensitive a viewer is to change. ***Local values*** and attitudes also affect viewer sensitivity. If the viewer group values aesthetics in general or if a specific visual resource has been protected by local, state, or national designation, it is likely that viewers will be more sensitive to visible changes. High viewer sensitivity helps predict that viewers will have a high concern for any visual change.

Movement also affects viewer sensitivity by creating dynamic viewsheds that change as the viewer moves through the landscape. Speed affects how long or short a view is based on the mode of travel, and the availability of views is affected by the surrounding terrain and vegetation and the presence or absence of built features.

Viewer sensitivity is also modified by the type of viewer, viewer activity, and visual expectations. For example, people driving for pleasure; people engaging in recreational activities such as hiking, biking, or camping; and homeowners generally have higher visual sensitivity to views. Viewers using recreational trails and areas, scenic highways, and scenic overlooks usually pay more attention to their surroundings, seek views, and have higher regard for the landscape composition. Residential viewers typically have extended viewing periods and are more concerned about and aware of changes in the views from their homes. Sensitivity tends to be lower for people driving to and from work or as part of their work because commuters and non-recreational travelers typically have fleeting views and tend to focus on commute traffic, not on surrounding scenery (Federal

Highway Administration 2015:6-2–6-4; U.S. Forest Service 1995:3-3–3-13; U.S. Soil Conservation Service 1978:3, 9, 12).

1. ***Visual dominance*** is based on viewer proximity as discussed in the definition of *viewshed*. Visual dominance is determined by the distance between the position of the viewer and a feature in the landscape. A feature in the landscape is more dominant and has a greater importance the closer the feature is to the viewer, whereas dominance and importance are reduced the farther away the feature is from the viewer.
2. ***Scenic vistas*** generally encompass a wide area with long-range views of surrounding elements in the landscape. Such vistas are often available to viewers due to open, flat agricultural lands with few obstructions and from elevated vantages with views over the landscape. In addition, vistas have a directional range. Some areas have scenic vistas with a 360-degree view in all directions, while others may be limited to one direction in a manner that reduces the line-of-sight angle and amount of vista that is visible, resulting in a narrower vista view.
3. ***Representative photos*** are photos used to establish the visual setting of the study area. These photos encompass views from the various distance zones affected within the study area and are selected to provide a sampling across all affected viewer groups, include the various affected landscape types, include views that range from higher to lower visual quality, and depict views from protected and non-protected areas.
4. The term ***urbanized area*** is defined by Section 15387 of the CEQA Guidelines as "a central city or a group of contiguous cities with a population of 50,000 or more, together with adjacent densely populated areas having a population density of at least 1,000 persons per square mile."

Visual Character and Quality of the Study Area

Identifying a study area's aesthetic resources and conditions involves understanding the area's visual features and the regulatory context. Once those parameters are understood, a study area's aesthetic resources are further defined by documenting its *visual character*, including the natural and built environments. The *affected population*, or viewers, are defined by their relationship to the study area, their visual preferences, and their sensitivity to changes associated with the improvements. Visual preferences, or what viewers like and dislike about the visual character, define that study area's *visual quality*. Visual quality serves as the baseline for determining the degree of visual impact (i.e., the creation of an intrusion or perceptible change to the environment that affects the scenic quality of a landscape) and whether a project's visual impacts would be adverse, beneficial, or neutral, depending on a variety of factors (e.g., personal experience, time of day, weather, seasonal conditions).

Study Area Landscapes

The visual character of the study area is defined by a variety of landscape types, both natural and built, due to the large size of the study area. A discussion of defining visual character and each landscape type is included in Table 1.

Table A. Summary of Study Area Landscapes and Defining Visual Features

Landscape Type	Summary/Defining Visual Features
Natural Landscapes	
Waterway Landscapes	Waterway features in the study area include the Pacific Ocean (ocean), Arcata and Humboldt Bay (bays), Mad and Elk Rivers, numerous channels and sloughs, and marshlands/tidal wetlands. Ocean views are primarily visible from elevated vantage points such as Trinidad Head and Table Bluff and from the oceanside beaches along the Samoa Peninsula and South Spit. These views consist of the expansive views of the ocean surface, with occasional passing boats and ships and waves rolling in and out. The sandy shoreline transitions to grassy sand dunes that gently rise above the beach. The waves rolling in tend to be choppy, even on fair weather days. The Samoa Peninsula and South Spit separate the ocean from the Arcata and Humboldt Bays and enclose the bays to the west, while the City of Eureka and the adjacent, forested hillsides define the eastern side of the bays. The bays are the most dominant waterways in the study area, because they are the most visible from a variety of locations within the study area. The bays are large, fairly shallow waterbodies. However, a dredged channel allows for larger boat passage into the Humboldt Bay, up to Tulowat Island. The bays' shorelines are mostly vegetated with marshlands, with mudflats that are exposed during low tides. Waters within the bays range from smooth to choppy, depending on weather conditions. The rivers and slough landscapes are dominated by singular, sinuous waterways that are long and meandering. Because of the length of the rivers and sloughs and their meandering forms, they are constantly moving in and out of the field of vision, particularly as viewed from the local roadways. Rivers and sloughs in the study area are tidally influenced and are mostly vegetated marshlands down to the waterline. Water levels in the bays and adjacent rivers and sloughs fluctuate seasonally and daily, which is most visually dominant at low tide when more of the adjacent shoreline and mudflats are exposed. Activity and movement are also important components of the visual landscapes of the bays, rivers, and sloughs and, depending on the amount of recreational boating, commercial shipping, and waterfowl activity, there is a constantly changing level of activity on these waterbodies. However, smaller sloughs do not see as much boating activity. Visually dominant features associated with waterway views include the SR 255 bridge over Humboldt Bay and the numerous smaller bridges constructed over the rivers and slough crossings, water access in the form of docks or marinas, and the ever-changing movement of the water itself, and the colors, textures, and patterns that result. The marsh landscape type consists of intermixed open water and wetland vegetation. It is characterized by fluctuating water levels and seasonal flooding from tidal action, rain, and management actions. The predominant visual characteristic of study area marshes is the large, flat, open expanse without prominent vertical features or human-made structures. The landscape has strong horizontality in form because of the plane of the water and the uniform height of marsh vegetation. The presence of islands in a marsh, which may have riparian forest, adds the primary vertical element to the landscape and generates visual interest. In these landscapes, views may change by season, and activity and movement of waterfowl contribute strongly to the character of the visual landscape.

Landscape Type	Summary/Defining Visual Features
	Lighting is generally absent; these are dark landscapes at night, except for occasional views of residences and structures dispersed along the banks and traffic headlights on roadways. Boat and ship movements generate ephemeral lighting. Natural glare is related to the waters' reflective quality. Most nonnatural sources of glare in this area are temporal and related to boats and ships. In marshes, due to a lack of passing boats or nearby residences, lighting and artificial glare are absent and natural glare is provided only by the waters' reflective quality.
Agricultural Lands	Agricultural lands are limited in the area, due to the salinity of the soil that lends itself to brackish marsh vegetation, as identified in Section II, *Agricultural and Forestry Resources*. Pasturelands tend to be the primary agricultural land use on lands that are slightly higher in elevation (e.g., Table Bluff) and not subject to tidal influence. Pasturelands are characterized primarily by broad expanses of open space, sometimes with gently rolling terrain, and generally afford broad vistas. During the rainy season, these pastures are verdant green, contrasted with dark-colored trees and coastal scrub. Due to the coastal influence, grasses remain green for much of the year. Artificial lighting is generally absent; these are dark landscapes at night, except for occasional views of farmsteads and rural residences dispersed through the landscape. Similarly, sources of glare are generally absent.
Forested Lands	Forested lands are located on the gentle hillsides surrounding Eureka. As identified in Section II, *Agricultural and Forestry Resources*, these forested areas contain oak, alder, fir, spruce, pine, redwood, and other deciduous and coniferous species. However, these lands are not actively harvested, because they do not fall within Timber Production Zones. Therefore, much of the forest remains intact with dark-colored trees. Artificial lighting is generally absent; these are dark landscapes at night, except for occasional views of rural residences dispersed through the landscape. Similarly, sources of glare are generally absent.
Undeveloped Open Space Landscapes	Undeveloped open space landscapes in the study area can include uncultivated lands interspersed among marshlands and developed land uses. Many of these lands are naturally recolonized after being unmanaged and are in various stages of the successional process, adding variety and visual interest. These lands may be suitable for wildlife and habitat, depending on their stage of naturalization. Lighting is generally absent; these are dark landscapes at night, except for occasional views of residences and structures dispersed in the distance and traffic headlights on roadways. Similarly, sources of natural and artificial glare are generally absent.
Built Landscapes	
Rural Coastal Communities	Rural coastal communities are characterized by the small communities and towns that are scattered throughout the Arcata and Humboldt Bay area. These towns, such as Manila, Brainard, Samoa, King Salmon, Fields Landing, and Table Bluff, are typically clustered alongside major transportation corridors. These communities tend to be located close to industrial land uses along the bays, serving as the residential areas for employees that work these industrial facilities. However, some of the communities, such as King Salmon, support more of the coastal recreational lifestyle. Rural coastal communities are compact, usually with well-defined edges providing a clear sense of entry and departure. Vertical features are present, but buildings are generally no taller than one or two stories. Residential landscaping creates varied forms,

Landscape Type	Summary/Defining Visual Features
	colors, and textures, and building materials of mostly wood siding painted various colors with corrugated steel or composite shingle roofing produce wide ranges of colors that dominate the visual field and contrast with the colors of the surrounding natural environment. Building forms and textural elements are highly varied by type of structure and use. The rural coastal community visual landscape is characterized by considerable human activity and movement, although these are largely confined to the daytime and early evening hours. Lighting is related to the varied building sources (interior and exterior lighting and signage). Street lighting may be present but often is limited in extent. Some buildings may create sources of glare.
Suburbanized Development	Based on the CEQA definition of an urbanized area (see above discussion of *Concepts and Terminology*), Arcata and Eureka are not urbanized because Arcata is smaller than Eureka and Eureka has a population of just over 26,500 (US Census Bureau 2022). Therefore, these small cities are considered to be suburban in nature and include areas that have a general visual character with single-family homes and strip commercial developments lining major streets and highways. Horizontal transportation corridors and blocks with one- to two-story buildings form a grid pattern that creates the dominant form of the cities. Much of the development in the cities includes suburban residential homes that range in age from the late 1800's to the late 1900's, where homes often have modest architectural styles. The downtown core of both cities includes historic areas that contribute to improving the overall visual character of the cities by creating visual interest in the form of unique architecture associated with historic buildings. The color and texture of buildings may vary particularly where historic architecture alternates with newer structures in the built environment. In most instances, the presence of suburbanized development hinders views or scenic vistas to the bay and ocean. The visual landscape is characterized by considerable human activity throughout the day and night, year-round. Lighting systems are extensive and are associated with the varied building sources (interior and exterior lighting and signage), street and highway lighting, ports and airports, and others. Many buildings may create sources of glare.
Industrial and Commercial Development	Industrial land uses are predominantly established along Humboldt Bay's shoreline between SR 255 and King Salmon and includes docks, transmission lines, substations, storage yards, and buildings with industrial uses, such as warehouses. The industrial landscape may occur in conjunction with other landscape types, such as grazing lands and channels and sloughs. However, commercial land uses are scattered throughout the study area. Although elements of nature, such as grasslands and water, may be present, this landscape type contains built elements that dominate and contrast greatly with the surrounding landscape. Verticality, mass, and form of industrial features are often strong visual elements. Color, pattern, and texture in industrial landscapes may vary by the type of industrial facilities that are present, but these facilities typically contrast strongly with the greater landscape. As a result, the surrounding natural landscape tends to recede to the background of the visual environment, often to such an extent that the overall character of an area is wholly changed. Only certain industrial uses generate much activity and movement (e.g., warehouses and industrial uses), lighting and glare in the environment can vary by the type of industrial structure that is present and can be a strong element in the nighttime landscape.

Landscape Type	Summary/Defining Visual Features
Recreational Development and Parks	Recreational development and parks are an established element along the bays' shorelines and include features that were built specifically for recreation or are used by recreationists. This includes such features as the Fisherman's Wharf at Trinidad, Humboldt Bay Rowing Association Dock, picnic and boat launch facilities at Arcata Marsh and Wildlife Sanctuary, marina at Woodley Island, Humboldt Bay Social Club facilities, Samoa Drag Strip, Samoa Boat Ramp, vista point at Samoa Bunkers, restrooms at Samoa Dunes Recreation Area, Eureka Boardwalk, Eureka Waterfront Trail, Eureka Public Marina, Del Norte Pier, Fort Humboldt State Historic Park, trails and interpretive exhibits associated with the Humboldt Bay National Wildlife Refuge, and the roadway out to the South Spit. Many of these public use areas provide visual access to the study area. These public use areas also tend to have minimal development, so that the natural environment dominates views over built features.

Study Area Views

The study area's viewshed includes viewpoints from which views would be affected by the Project. These viewpoints are defined by the physical constraints of the environment, including weather conditions, and the physiological limits of human sight. The study area was photo-documented during site visits occurring on April 26-27, 2022; June 16-19, 2022; September 4, 2022; and November 1, 2023, to understand existing visual conditions associated with the study area and critical viewpoints, referred to as key views (KVs) herein, which are seen by sensitive viewer groups including recreationists, roadway users, businesses, residences, and the Wiyot Tribe. However, the photographs were taken from public vantages only. Candidate KVs (cKVs) include all locations – a total of 137 locations – that were photo documented during the various site visits. From these cKVs, representative photos were selected to convey the existing visual character associated with the study area. The KVs are identified by their previous cKV designations; 16 KVs were selected for representative photographs. These are mapped on Figure B and the photos are in Figures C-1 through C-8.

Larger numbers of viewers, particularly recreational users, are more likely to be present at public use areas such as beaches and the Eureka Boardwalk on sunny days, when viewing conditions are better than on rainy or foggy days. Although rain and coastal fog can limit visibility within the study area during the summer months, the mid-summer to late-fall months can have exceptional visibility. Due to California's mild climate, viewers can be found enjoying coastal resources year around. However, existing views within the study area are based on clear-day visibility. The Samoa Pulp Mill smokestack is located immediately adjacent to the Project site and served as a landmark for locating the Project site within the landscape.

Water-based Views

Existing water-based views of the study area are available to people on Humboldt Bay waters on recreational and fishing boats, pleasure craft, rowing boats, kayaks, tour boats, commercial fishing boats, cargo ships predominantly dealing with wood products, and occasional passenger cruise ships with visibility of prospective Project features at the Project site. Boating in Arcata Bay is limited to smaller recreational and fishing boats, pleasure craft, rowing boats, and kayaks due to the shallow nature of this bay. The primary focus of views from the bays consists of the natural landscapes and landforms associated with the Samoa Peninsula and South Spit, the bay entrance,

industrial development along the Samoa Peninsula, development associate with Eureka, the docks along Woodly Island, the SR 255 bridge, and the forested hillsides surrounding Eureka (Figures C1, Key View 82). In addition to taking in their surroundings, water-based viewers are focused on navigating the bays' waters and other boat traffic. The industrial development of the harbor and development associated with Eureka can stand out as a focal point in water-based view. However, the natural scenery associated with the peninsulas, marshlands surrounding the bays, and forested hillsides surrounding Eureka greatly contribute to views from the water.

Existing views of the study area are not present from the ocean due to the sand dunes and existing industrial infrastructure and vegetation that prevent bayside views of the Project site, even from cargo and cruise ships that have elevated visibility out and over the ocean due to their ships' decks.

Peninsula Views

Peninsula views include those from the Samoa Peninsula and South Spit. The Samoa Peninsula contains a mix of natural and developed landscapes, which provide a variety of views. Picturesque views include views out and over the sand dunes that are available from the various recreational access points location throughout the peninsula, such as from the Samoa Dunes Recreation Area (Figure C-1, Key View 113 and Figure C-2, Key View 120). Such views are mostly dominated by the natural sand dune landscape and, although industrial development and other views of structures such as the historic Humboldt Bay Life-Saving Station are visible, such development does not dominate views. It is important to note that areas of the Samoa Peninsula include historic seasonal food-gathering sites for the Wiyot Indians and views associated with these sites may be of cultural importance to the tribe.

The established residential areas of Samoa, Fairhaven, and Manila are also located on the peninsula and have varying degrees of visibility toward the Project site. Samoa is located directly adjacent to the Project site. Residences located on the eastern edge of the town have the direct and unobstructed views toward the Project site (Figure C-2, Key View 48 and Figure C-3, Key View 46), while intervening buildings and mature trees limit views for residences located further west. However, streets that run perpendicular to the site provide narrower view corridors to the proposed Project from within Samoa. Fairhaven is located under 1.5 mile south of the Project site but is separated from the Project site by other industrial development. This industrial development, mature trees, and development associated with Fairhaven prevent existing views of the Project site (Figure C-3, Key View 95). Manila is only likely to have views of the Project site from the marshlands along Manila Park, because the town's location along the peninsula is such that the intervening, low-lying landforms and mature vegetation prevent views of the Project site from elsewhere in the town.

The South Spit is undeveloped and natural, with one main access road. Views of the Project site are not currently available due to intervening, low-lying landforms and mature vegetation on the Samoa Peninsula that prevent views of the Project site from the South Spit. The closest potential views available from the South Spit are primarily distant middleground to background views that are available to recreational viewers and roadway travelers accessing the northern end of the South Spit, which is a popular recreation area located at the inlet to Humboldt Bay (Figure C-, Key View 122). From this distance, the inlet's waterway and landforms of the dunes are the main focus of views, while the surrounding forested hillsides complement the view. However, the smokestack is visible and creates a focal point from this distance.

Island Views

Island views include those from Woodley Island and Tuluwat Island. Woodley Island consists of a mix of natural marshlands and upland habitat with developed land uses. Development on Woodly Island consists of parking areas, docks, and supporting facilities for the Woodley Marina. Additional development includes buildings associated with the National Weather Service; Humboldt Bay Harbor, Recreation and Conservation District offices; and Café Marina. Public views from Woodly Island are mostly focused on activity on the water and activities and features associated with the marina docks and moored boats on Woodley Island and the shoreline of Eureka, across the channel. However, views of the Project site are available from the western end of Woodley Island, near The Fisherman statue, which is part of the lost fisherman's memorial honoring those lost at sea from the area, and the Indian/Gunther Island, Site 67 (Tolowot) National Historic Landmark monument marker. From this location, views of the Project site are mostly obscured by Tuluwat Island, except for the southern end of the Project site (Figure C-4, Key View 64). There are no public views available from the adjacent, undeveloped and natural Daby Island.

Tuluwat Island is of significant importance to the Wiyot Tribe, which identifies the island as the center of the world. Tuluwat Island consists mostly of natural marshlands, with small upland areas, and several residences that are located along the island's southern edge. Views from the island consist of view out toward Humboldt Bay, Woodley Island, and the development and natural landscapes associate with the Samoa Peninsula and Eureka. The island is not accessible to the public, but public views are available from SR 255 that crosses the island and provides unobscured views of the Project site (Figure C-5, Key View 50). Due to the presence of mature trees surrounding the residences on the island, which can be seen in Key View 64, it is not expected that the Project site is visible from these residences.

Waterfront Views

Residential, recreational, commercial, industrial, and open space land uses are located along the study area's shoreline. Views toward the Project site are readily available from highly used waterfront locations with ground level views, such as from the Eureka Public Marina and Eureka Waterfront Trail (Figure C-5, Key View 84 and Figure C-6, Key View 102, respectively), and from the upper levels of buildings, such as hotels and businesses. Foreground and middleground views are often sweeping and include Humboldt Bay, its shoreline, surrounding development, and adjacent hills. However, even at a closer distance, foreground and middleground views are often limited by fog and haze. The industrial development at the Project site is an existing visual element along the waterfront that lacks distinct visual elements to make it stand out amongst the other industrial development along the Samoa Peninsula. Therefore, the Project site blends in with other industrial development along the peninsula and is not readily discernable in views. In addition, foreground elements in views tend to capture the viewers' eye while industrial development along the Samoa Peninsula shoreline becomes a cohesive backdrop to foreground views of marshlands and bay waters.

For background vantages, distance and landforms that jut into Humboldt Bay, such as King Salmon and the sand dunes at the Elk River outlet into Humboldt Bay, prevents views of the Project site from ground-level vantages. From ground-level vantages, foreground elements in views and the surrounding forested hillsides tend to capture the viewers' eye while industrial development along the Samoa Peninsula shoreline is either not very noticeable or not visible at all (Figure C-6, Key View 124 and Figure C-7, Key View 136). However, elevated vantages provide background views toward

the Project site where some of the industrial development associated with the Samoa Peninsula may be visible (Figure C-7, Key View 132). The Project site is not visible or distinguishable in such views because distance, landform, and intervening vegetation prevents direct views of Project site.

Inland Views

Residential, recreational, commercial, institutional, and industrial land uses are located inland from the waterfront; some of these land uses are located on flatter terrain and others are elevated on the nearby hillside. There are no views of the Project site from most of these land uses, whether on flat or elevated terrain, because fencing, landscaping, adjacent buildings and development, and infrastructure act to prevent views. Where views of the Project site are available from developed areas inland, they are often limited by vegetation, buildings, and infrastructure located within the foreground of views and distance so that the Project site is not a focal point or prominent feature in these viewsheds (Figure C-8, Key View 24 and Key View 29). From such vantages, views of the Arcata and Humboldt Bays and the surrounding forested hillsides are the focal point. Views from recreational areas located inland are similar to views from developed areas in that views of the Project site are often not available or are mostly limited by vegetation, surrounding development, and infrastructure. Fog and haze also act to commonly limit or lessen views of the Project site from inland areas.

Study Area Visual Quality

As identified in Appendix C, *Visual Impacts Methods of Analysis*, the overall visual quality is then calculated for existing and proposed conditions by averaging the natural harmony, cultural order, and Project feature coherence ratings as follows.

The overall visual quality is then assigned a descriptive rating, called a *visual quality rating*, based on the numeric values. The visual quality of the key views provided above in *Study Area Views* are provided below in Table B in the order in which they appear in the text.

Table B. Study Area Visual Quality

Key View	Natural Harmony Rating	Cultural Order Rating	Project Site Coherence Rating	Visual Quality Rating
Water-based Views				
82	Moderately High	Moderately Low	Moderate	Moderate
Peninsula Views				
113	Moderately High	Moderately High	High	Moderately High
120	High	High	High	High
48	Moderate	Low	Moderately Low	Moderately Low
46	Moderate	Moderately Low	Moderately Low	Moderately Low
95	Moderately Low	Moderate	Moderate	Moderate
122	Moderately High	Moderate	Moderately High	Moderately High
Island Views				
64	Moderate	Moderately Low	Moderate	Moderate
50	Moderate	Moderately Low	Moderate	Moderate
Waterfront Views				
84	Low	Moderately Low	Moderate	Moderately Low
102	Moderately Low	Moderately Low	Moderate	Moderately Low
124	Moderate	Moderate	Moderate	Moderate
136	High	High	Moderately High	High
132	Moderately High	Moderately High	Moderately High	Moderately High
Inland Views				
24	Moderate	Moderate	Moderate	Moderate
29	Moderately High	Moderately High	Moderate	Moderately High

As identified in Table B, the visual quality of the study area varies depending on the viewer's location in the landscape and can range from moderately low to high.

Characterization of Viewers

The study area consists of both developed and undeveloped areas, and viewer groups within the study area include recreational, residential, and business (i.e., retail, commercial, institutional, civic, industrial, and agricultural) viewers and travelers on local roadways. The primary viewer groups within the study area are categorized as people living or conducting business in developed areas; travelers using the freeways, arterial roads, and smaller local roads; and recreationists (boaters, swimmers, and anglers using local waterways; trail users; equestrians; bicyclists; joggers; and others). The characterization of viewers and their preferences was established using a public involvement approach. Public scoping comments on aesthetic and visual resources and field survey results were reviewed to gauge public concerns pertaining to aesthetic and visual resources associated with the Project and to understand how viewers work, live, recreate, and experience the study area. This analysis evaluates the sensitivity of each viewer group and describes it using five ratings: low, moderately low, moderate, moderately high, high, and very high. Affected viewer groups and their associated sensitivities are identified in Table C.

Two overarching groups of viewers are affected by a project: neighbors and users. *Neighbors* are those people who have views *of* a project feature because they are adjacent to it. *Users* are those people who are within project boundaries and have views *from* a project feature. Following are the

types of neighbors and users that can be affected by a project (Federal Highway Administration 2015:5-6–5-10).

Table C. Affected Viewer Groups and Associated Sensitivities for the Project

Viewer Group	Sensitivity	Reasoning
Recreational Viewers	High	Recreational viewers provide or participate in active and passive recreational uses, such as organized sporting events, indoor and outdoor leisure activities, and cultural events. Recreational services provided for visitors can be permanent, while the visitors are more transitory. Recreational viewers using parks/recreational facilities, waterways, roadways, and trails are likely to seek out natural areas and scenic views that could be affected by project features for both shorter and longer durations. Recreationists are more likely to value the natural environment, appreciate the visual experience, and have a strong sense of ownership over the waterways and corridors they use for recreation and that are highly valued throughout the Arcata and Humboldt Bays region. Recreational viewers encompass a diverse group, including those that live in or frequent the study area and are therefore familiar with their surroundings, as well as tourists who visit less frequently and would be less attuned to changes in the environment. Tourists travel individually or in groups through an area for enjoyment on trips that are generally more adventurous and cover longer distances; therefore, their focus is typically on the study area scenery as a whole, rather than on expected visual details at specific locations. Recreational viewers are often focused on their recreational activity, and although they tend to be unsupportive of visual changes that would negatively affect the recreational setting, they tend to be supportive of visual improvements that enhance their recreational experience.
Roadway Travelers	Moderately low to Moderately high	Travelers can include pedestrians, cyclists, and motorists that use various modes of transportation for commuting, touring, and shipping. Pedestrians use their feet, a wheelchair, or other mobility devices, most often on a sidewalk or trail. Cyclists use bicycles at greater speeds than pedestrian travel, and may use trails, traffic lanes, and sidewalks. Motorists use vehicles with engines (e.g., cars, trucks, buses, motorcycles, mopeds, or any other technology that is not self-propelled, regardless of fuel source). Motorists move at higher speeds than other groups. By necessity, the driver of a motor vehicle focuses less on the view outside the vehicle. The driver's primary interest is in project coherence, although natural harmony and cultural order also provide resources used for wayfinding. Good natural harmony and cultural order can increase driver attentiveness. Passengers within vehicles move at high rates of speed and may be focused on views outside the vehicle or on activities within the vehicle such as talking, reading, eating, people watching, or napping. Passengers prefer evidence of good natural harmony and cultural order. Commuters travel the same route regularly, have a repeated routine, and are often single drivers, but they may also be passengers; and trips can include commuting to work or to a favorite or frequent destination (e.g., campground, cabin, sports field, relative's home). Tourists travel individually or in groups through an area for enjoyment, often with a set destination, on trips that are generally more adventurous, cover

Viewer Group	Sensitivity	Reasoning
		longer distances, and take more time than commuting trips. Shippers are generally single drivers moving goods on routine routes of varying distances. Travelers on local roadways pass areas that would be affected by project features. Travelers use roadways in the study area at varying speeds; normal highway and roadway speeds differ based on the traveler's familiarity with the route and roadway conditions (e.g., rain, curvature, and slope of the road). Single views are typically of short duration, except on straighter stretches where views last slightly longer. The passing landscape becomes familiar to viewers who travel routes frequently, and their attention typically is not focused on the passing views but on the roadway, roadway signs, and surrounding traffic. Viewers who travel local routes for their scenic quality generally possess a higher visual sensitivity to their surroundings because they are likely to respond to the natural environment with high regard and as a holistic visual experience.
Residential Viewers	High to very high	Residential viewers can be owners or renters that live within viewing distance of a proposed project. Suburban and rural residents in the study area have potential longer-term exposure to views that would be affected by project features. Residential viewers tend to have an invested interest and sense of ownership over nearby aesthetic resources and generally desire to maintain the existing landscape as-is because how their neighborhood looks is a contributing factor for residents choosing to live there. Therefore, residential viewers tend to be uninterested in change unless they have been able to participate in defining the change.
Business/ Institutional Viewers	Moderate	Viewers from businesses, including industrial, retail, commercial, civic, agricultural, and institutional facilities situated throughout the study area, have semi-permanent views of areas that would be affected by project features. Business workers are present as viewers for longer durations, while patrons tend to be more transitory. Workers and patrons are often focused on tasks at hand (i.e., working or shopping), but some may be focused on wayfinding signage, landscaping, and public image as well. Of business viewers, those associated with agricultural work or land ownership are most exposed to, and therefore have the highest expectations for, cultural order and natural harmony in the landscape. **Industrial viewers**. Industrial viewers mine or harvest raw materials; manufacture goods and services; or transport goods and services, and often require large amounts of land that has limited exposure to the public. Industrial viewers' visual preference is generally utilitarian unless they want to enhance the public presentation and views of their facility. Industrial viewers tend to be primarily workers with few transitory visitors. **Retail viewers**. Retail viewers include merchants that sell goods and services and the shoppers that buy them. Merchants generally want heightened visibility, free of competing visual intrusions, while shoppers need to be able to easily find their destination and, once there, concentrate on the shopping experience. Merchants tend to be more permanent than shoppers, although shoppers often frequent the same stores repeatedly, giving them a sense of permanence.

Viewer Group	Sensitivity	Reasoning
		Commercial viewers. Commercial viewers are those occupying or using office buildings, warehouses, and other commercial structures. Commercial viewers' visual preferences vary depending on the business and may be more aligned with retail, institutional, or industrial viewers' visual preferences than those of residential viewers. Workers are often permanent, while visitors and customers are transitory. **Civic viewers**. Civic viewers provide or receive services from a government organization, such as a military reservation or a federal, state, or local agency. Views of government facilities may or may not be desired, depending on the particular organization and work being performed. Workers and employees of the government facilities are present for longer durations, while visitors are more transitory. **Agricultural viewers**. Agricultural viewers are agricultural landowners and workers in fields and pastures maintaining crops or herd animals. Cultural order and natural harmony are critical components of the landscape. Some agricultural viewers are permanent, but many are transient, although they may return to the same area seasonally. **Institutional viewers**. Institutional viewers provide or receive services from such places as schools or hospitals that serve the community. Consequently, institutions often promote a public image to adjacent viewers, and the presentation of their buildings and grounds are important and tend to be well maintained. Signage or orientation and wayfinding are commonly associated with institutional facilities. Workers and employees of the institution are present for longer durations, while visitors are more transitory.

Discussion

a. Have a substantial adverse effect on a scenic vista?

The EIR will assess the extent to which project construction or operation will affect an existing scenic vista.

b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings along a scenic highway?

There are no federal, state, or local scenic highways associated with the study area. Therefore, this will be identified in the EIR and dismissed from further analysis.

c. In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

Under CEQA, an urbanized area is defined by Section 21071 of the CEQA Guidelines as an incorporated city with a population of at least 100,000; an incorporated city with a population of less than 100,000 persons if the population of that city and not more than two contiguous incorporated cities combined equals at least 100,000 persons; or an unincorporated area that meets both of the following:

- that is either completely surrounded by one or more incorporated cities and the population of the unincorporated area, and the population of the surrounding incorporated city or cities equals not less than 100,000 persons and the population density of the unincorporated area at least equals the population density of the surrounding city or cities, OR that is located within a locally adopted general plan urban growth boundary and has an existing residential population of at least 5,000 persons per square mile; AND
- the board of supervisors with jurisdiction over the unincorporated area has previously issued a finding that the general plan, zoning ordinance, and related policies and programs applicable to the unincorporated area are consistent with principles that encourage compact development in a manner that encourage compact development in a manner that promotes efficient transportation systems, economic growth, affordable housing, energy efficiency, and an appropriate balance of jobs and housing; and protects the environment, open space, and agricultural areas. In addition, the board of supervisors must have submitted a draft finding to the Office of Planning and Research at least 30 days prior to issuing a final finding and allowed the office 30 days to submit comments on the draft findings to the board of supervisors.

By this definition, the Project is not located within an urbanized area. Therefore, the analysis will focus on changes to visual character and quality in a non-urbanized area. Construction impacts will cover the act of constructing Project features associated with the Humboldt Marine Terminal Project and the built presence of finished Project features. The construction analysis will assess visual changes associated with demolishing existing features on the site; the visible presence of heavy equipment associated with construction; and how the terminal buildings, parts storage areas, roadways and parking areas, fencing, cranes, docks, and ancillary site features would either blend or contrast with the existing visual character and quality of the site and areas surrounding the site. Operational impacts will cover visual changes seen once the Project has begun functioning and will assess visual changes associated with turbines being constructed, stored in the bay, towed out of the bay and the ongoing maintenance of Project features. Changes to visual character and quality will be assessed by factoring how sensitive visual receptors would respond to visual changes in the landscape during construction and operation. The EIR will also evaluate changes to the existing visual character and quality of the landscape during construction and operation as they affect scenic vistas that are available throughout the study area. Photo simulations prepared for the Project will aid in analyzing changes in visual character and quality.

d. Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?

ICF will qualitatively evaluate changes in daytime and nighttime light and glare that would occur during construction of the Project, from the built presence of the completed Humboldt Marine Terminal, and during operation of the Project. Changes in light and glare will be assessed by comparing existing to proposed conditions and how proposed changes would affect sensitive viewers. There are no federal, state, or local scenic highways associated with the study area. Therefore, this will be identified in the EIR and dismissed from further analysis.

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II. Agricultural and Forestry Resources

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
In determining whether impacts on agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts on forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project, and forest carbon measurement methodology provided in the Forest Protocols adopted by the California Air Resources Board. Would the project:				
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b. Conflict with existing zoning for agricultural use or conflict with a Williamson Act contract?	☐	☐	☐	☒
c. Conflict with existing zoning for, or cause rezoning of forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	☐	☐	☐	☒
d. Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e. Involve other changes in the existing environment that, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	☒	☐	☐	☐

Affected Environment

Agricultural Resources

Prime and Non-prime Agricultural Lands

"Prime" agricultural land is land best suited for a wide range of agricultural crops. The California Farmland Mapping and Monitoring Program (FMMP), based on soil surveys produced by the U.S. Natural Resources Conservation Service (NRCS), is a nonregulatory program that provides a consistent and impartial analysis of agricultural land use and land use changes throughout California. Humboldt County is not mapped in the latest FMMP released by the California Department of Conservation (DOC 2024).

The County defines prime agricultural lands based on California Government Code Section 51201(c), which is described in Policy AG-S7 of the County's General Plan (Humboldt County 2017). The highly productive soils of the Mad River, Redwood Creek, and Eel River deltas surrounding Humboldt Bay, as well as other areas, provide the basis for Humboldt County's agricultural resources. The majority of its prime agricultural lands, which contain prime soils, are found in these areas. Per Section 51201(c), the ability to support livestock used for the production of food and fiber with an annual carrying capacity equivalent to at least one animal-unit per acre as defined by the U.S. Department of Agriculture does not apply to the Proposed Project area. The Proposed Project area has little or no forage value, and thus does not have a livestock carrying capacity of one animal unit per acre. In addition, the Proposed Project area is not planted with crops. The Proposed Project area is not capable of producing an unprocessed plant production adequate for economically viable operations. It is not necessary to provide for an economically viable agricultural area, as it is not currently in agricultural production. Therefore, the Project area does not satisfy Criteria D, E, or F per Section 51201(c) of the California Government Code. The Project Site does not include any Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Humboldt County 2023).

Prime agricultural soils in the Proposed Project area and vicinity are adjacent to Humboldt Bay . There are no parcels in the Proposed Project area that are in agricultural production. The closest prime agricultural lands to the RMT 1 site are near Eureka Slough (2.5 miles), Elk River (3 miles), and Arcata Bottoms (4.5 miles). (Humboldt County 2023). Other elements of the Proposed Project area such as what is proposed at Woodley Island, the dredge spoils dewatering area at Samoa Lagoons, or navigation aids in the Humboldt Bay may vary slightly in distance than that noted above, but not to a degree that affects the analysis for this topic.

Williamson Act Contract Lands

The Proposed Project area does not include any land covered by a Williamson Act contract (Humboldt County 2023). There are no parcels in the Proposed Project area that are in agricultural production. The closest Williamson Act lands are near Murray Field (4 miles) or Elk River (3.6 miles). Other elements of the Proposed Project area such as what is proposed at Woodley Island, the dredge spoils dewatering area at Samoa Lagoons, or navigation aids in the Humboldt Bay may vary slightly in distance than that noted above, but not to a degree that affects the analysis for this topic. No portion of the Proposed Project area is or has been under active Williamson Act contracts.

Agricultural Zoning

Agriculture Exclusive (AE) zoned lands are located primarily to the north, east and south of the Proposed Project area (Humboldt County 2023). The AE classification is applied to fertile areas in which agriculture is and should be the predominant use, and where the protection of this use from encroachment by incompatible uses is essential to the general welfare. The closest prime agricultural lands to the RMT 1 site are near Eureka Slough (2.5 miles), Elk River (3 miles), and Arcata Bottoms (4.5 miles). Other elements of the Proposed Project area such as what is proposed at Woodley Island, the dredge spoils dewatering area at Samoa Lagoons, or navigation aids in the Humboldt Bay may vary slightly in distance than that noted above, but not to a degree that affects the analysis for this topic.

Forestry Resources

Approximately 1.9 million acres of forested land in Humboldt County accounts for more than 80 percent of the county's total land area. Of these 1.9 million acres of forestland, 1.7 million acres are considered to be suitable for timber production. About 1 million acres are designated as Timberland Production Zone (TPZ). This acreage is equal to 45 percent of the total land acreage in Humboldt County. Timber Resource lands throughout Humboldt County are zoned TPZ. The TPZ is intended to provide standards and restrictions for the preservation of timberlands for growing and harvesting timber; however, no lands are zoned TPZ within or nearby the Proposed Project areas. The closest designated timberlands are located 3.3 miles to the east/southeast. (Humboldt County 2023).

Humboldt County is first in the state's timber production (California Department of Food and Agriculture 2018). However, the county's timber industry has been in decline since 2000. Between 2000 and 2008, the total gross value of timber production dropped from $285.2 million to $108 million (Humboldt County 2017). In 2016, the county's total gross value of timber production was $70 million (Humboldt County Agricultural Commissioner 2017).

Other elements of the Proposed Project area such as what is proposed at Woodley Island, the dredge spoils dewatering area at Samoa Lagoons, or navigation aids in the Bay may vary slightly in distance than that noted above, but not to a degree that affects the analysis for this topic.

Mariculture

Humboldt Bay is California's largest producer of market size Kumamoto oysters (Magallana sikamea) and Pacific oysters (Crassostrea gigas). Humboldt Bay also has Kumamoto oyster, Pacific oyster and Manila clam (Venerupis philippinarum) nursery operations that provide juvenile shellfish for growout to market size in other west coast embayment's. Shellfish culture is limited to north Humboldt Bay and the Samoa channel. At the Project site, there is existing oyster and clam nursery culture and seaweed culture. These operations are part of the Harbor District's Humboldt Bay Mariculture Pre-Permitting Project. Through this project, the Harbor District maintains regulatory approvals for shellfish and seaweed culture at the site and culturists operate under these approvals through leases from the Harbor District.

Regulatory Setting

State

Williamson Act

The California Land Conservation Act of 1965, commonly known as the Williamson Act, enables local governments to form contracts with private landowners to promote continued agricultural or related open space uses. In return, landowners receive property tax assessments that are based on farming and open space uses rather than full market value and development potential. The State of California ceased subvention (subsidy) payments in 2009 because of statewide budget concerns. The contracts are renewable annually and may restrict the land to agricultural use for at least 10 years. Humboldt County had approximately 202,934 acres of land under Williamson Act contracts in 2015 (the most recent year for which data is available). Similarly, Humboldt County contained an additional 697 acres designated as Farmland Security Zone (FSZ) lands FSZs function similarly to land under Williamson Act contracts; however, the length of the contract is 20 years rather than 10 years.

The nonrenewal process is the most common mechanism for termination of Williamson Act contracts. In Humboldt County as of 2015, approximately 2,649 acres of contract lands were in some stage of the nonrenewal process, and the amount of contract land actually terminated through nonrenewal expirations totaled approximately 440 acres.

The local jurisdiction approving the cancellation must find that the cancellation is consistent with the purpose of the California Land Conservation Act or is in the public interest (California Government Code Section 51282).

An expanded version of the Williamson Act, known as the Farmland Security Zone Act, was enacted in 1998. A Farmland Security Zone Act contract offers landowners greater property tax reduction in return for an initial contract term of 20 years, with renewal occurring automatically each year. Land restricted by a Farmland Security Zone Act contract is valued for property assessment purposes at 65 percent of its land conservation act valuation, or 65 percent of its Proposition 13 valuation, whichever is lower.

Z'berg-Nejedly Forest Practice Act of 1973

The Z'berg-Nejedly Forest Practice Act of 1973 (California Code of Regulations [CCR Title 14, Article 7) is the primary forest regulation statute in California and generally is referred to as the Forest Practice Act (FPA). The FPA provides for creation of a State Board of Forestry to manage forest practices and resources, and the Board has developed forest practice rules to implement the FPA.

CAL FIRE enforces the requirements of the FPA and serves as lead agency for projects that fall within the scope of the FPA. If timber operations (as defined by California Public Resources Code [PRC] § 4527) are part of a project (or would be affected by a project), these operations must be approved by CAL FIRE. CAL FIRE is responsible for ensuring that private landowners abide by this law when harvesting trees. Compliance with the Forest Practice Act and Board rules apply to all commercial harvesting operations for landowners of small parcels, to ranchers owning hundreds of acres, and large timber companies with thousands of acres.

The Timber Harvesting Plan (THP), which must outline the amount of timber intended to be harvested, how it would be harvested, and the steps that would be taken to prevent damage to the

environment, is the environmental review document submitted by landowners to CAL FIRE. THPs are prepared by Registered Professional Foresters (RPFs) who are licensed to prepare these comprehensive detailed plans. A THP that does not comply with all forestry and environmental regulations is returned to the RPF. It is only approved after the RPF and landowner agree to make the changes necessary to ensure compliance with all laws. CAL FIRE follows-up on approved THPs with site inspections and can shut down operations, cite or fine RPFs, Licensed Timber Operators (LTOs), and landowners if illegal operations are found (CAL FIRE 2020).]

Timberland Production Zones

According to the Z'Berg-Warren-Keene-Collier Forest Taxation Reform Act (California Government Code §§ 51110–51119.5), enacted in 1976, counties must provide the zoning of land used for growing and harvesting timber as Timberland Production Zones. TPZs were established to preserve and protect timberland from conversion to other uses and avoid land use conflicts.

The Timberland Productivity Act (California Government Code §§ 5110–5115) of 1982 later formalized the state's policy in favor of sustainable harvest, focusing on the long-term availability of timber resources. Five compatible uses are identified for TPZ lands:

1. Watershed management
2. Fish and wildlife management, including hunting and fishing
3. Uses related to the growing, harvesting, and processing of forest products
4. Construction, alteration, or maintenance of utility facilities
5. Grazing

Lands zoned TPZ must be maintained for timber production for 10 years following the zoning declaration; after 10 years, the TPZ status automatically renews each year. If a property owner petitions to have the land rezoned out of TPZ, the land is normally subject to a 10-year slide-out process. Alternatively, if immediate rezoning is requested, an extensive review and approval process is required. The minimum parcel size for TPZ zoning is 160 acres, although smaller parcels may be zoned TPZ, if a joint timber management plan is prepared.

California Public Resources Code

PRC Section 21060.1 contains the following definition of agricultural land:

A. Agricultural land means prime farmland, farmland of statewide importance, or unique farmland, as defined by the United States Department of Agriculture land inventory and monitoring criteria, as modified for California.

B. In those areas of the state where lands have not been surveyed for the classifications specified in subdivision (a), "agricultural land" means land that meets the requirements of "prime agricultural land" as defined in paragraph (1), (2), (3), or (4) of subdivision (c) of Section 51201 of the Government Code.

The PRC provides the following definition for forest land:

Section 12220(g) defines forest land as land that can support 10 percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits.

Section 4526 defines timberland as land, other than land owned by the federal government and land designated by the board as experimental forest land, which is available for, and capable of, growing a

crop of trees of a commercial species used to produce lumber and other forest products, including Christmas trees.

California Government Code

California Government Code definitions applicable to the Proposed Project include the following.

Section 51104(g) defines "timberland production zone" to mean an area which has been zoned pursuant to Section 51112 or 51113 and is devoted to and used for growing and harvesting timber, or for growing and harvesting timber and compatible uses. Compatible uses are defined under Section 51104(h) and include the construction and maintenance of electric transmission facilities.

Section 51112 identifies situations which would warrant a decision that a parcel is not devoted to and used for growing and harvesting timber or for growing and harvesting timber and compatible uses.

Section 51113 allows the opportunity for a landowner to petition that his or her land be zoned timberland production.

Section 51201(c)(5) defines "prime agricultural land" as land that has returned from the production of unprocessed agricultural plant products an annual gross value of not less than $200 per acre for 3 of the previous 5 years.

Local

Humboldt County General Plan (HCGP)

The HCGP was adopted on October 23, 2017. As described in its Section XI, Land Use, the HCGP establishes land use designations to allow for the orderly development of lands within the County. The HCGP Land Use Element contains policies related to the protection of agriculture and forestry resources and uses. The HCGP Land Use Element governs how land is to be utilized, many of the issues and policies contained in other plan elements are linked in some degree to this element. The Land Use Element contains goals, policies, and programs concerning land use. The policies in the Land Use Element address countywide issues that are general in nature and may apply to numerous locations and land use designations within the planning area.

Humboldt Bay Area Plan (HBAP)

The HBAP contains policies protecting agricultural lands and preventing water and sewer line extensions to serve these areas. Section 3.13 (B)(4) states "Where coastal-dependent uses conflict among themselves, priority shall be given to industrial over recreational or commercial uses, and to recreational over commercial uses; except that industrial, recreational, and visitor serving use of private lands shall not displace existing agricultural use where the Area Plan or zoning protect the use". (Humboldt County 2022).

Discussion

a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

While Humboldt County is not yet included in the latest California Department of Conservation FMMP, the Project Site contains no agricultural or forestry resources, nor are there any in the near vicinity that would be impacted by the Project. The closest resource lands are more than two miles

from the Project Site. Therefore, the Proposed Project would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to nonagricultural uses.

b. Conflict with existing zoning for agricultural use or conflict with a Williamson Act contract?

The Project Site contains no agricultural zoned lands, nor are there any in the near vicinity that would be impacted by the Project. The closest agricultural zoning is more than two miles from the Project Site. Therefore, the Proposed Project would not conflict with existing zoning for agricultural uses or Williamson Act contracts.

c. Conflict with existing zoning for, or cause rezoning of forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?

The Project Site contains no forestry (TPZ) zoned lands, nor are there any in the near vicinity that would be impacted by the Project. The closest forest, timberland or TPZ resources are more than two miles from the Project Site. Therefore, the Proposed Project would not conflict with existing forestry resources or zoning.

d. Result in the loss of forest land or conversion of forest land to non-forest use?

The Project Site contains no forestry (TPZ) resource lands, nor are there any in the near vicinity that would be impacted by the Project. The closest forest, timberland or TPZ resources are more than two miles from the Project Site. Therefore, the Proposed Project would not conflict with existing forestry resources or conversion of forest land to non-forest use.

e. Involve other changes in the existing environment that, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?

There are existing shellfish nurseries and seaweed farms within the Project area that will be displaced by the Project. These farms operate under permits that are held by the District and all permit conditions are transferred to the farmers (lessees) through lease terms. The lessees include private, non-profit and academic organizations. As part of the Project, the District will relocate these existing farms to another location in Humboldt Bay that has not yet been identified. The impact of displacing and relocating the farms will be assessed in the EIR.

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III. Air Quality

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:				
a. Conflict with or obstruct implementation of the applicable air quality plan?	☒	☐	☐	☐
b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an applicable federal or state ambient air quality standard?	☒	☐	☐	☐
c. Expose sensitive receptors to substantial pollutant concentrations?	☒	☐	☐	☐
d. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☒	☐	☐	☐

Affected Environment

The Proposed Project area, described in Chapter 2, *Project Description*, is within the North Coast Air Basin (NCAB). Ambient air quality is affected by climatological conditions, topography, and the types and amounts of pollutants emitted. The following sections describe the pollutants of concern and summarize how they move through the air, water, and soil within the air basin, and how air pollution is changed in the presence of other chemicals and particles. This section also summarizes local climate conditions, existing air quality conditions, and sensitive receptors that may be affected by program-generated emissions.

Pollutants of Concern

Criteria Pollutants

As discussed above, the federal and state governments have established National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS), respectively, for six criteria pollutants. Ozone is considered a regional pollutant because its precursors affect air quality on a regional scale. Pollutants such as carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead are considered local pollutants that tend to accumulate in the air locally.

Particulate matter (PM) is both a local and a regional pollutant. The primary criteria pollutants generated by the Proposed Project would be ozone precursors (nitrogen oxides [NO_X] and reactive organic gases [ROG]), NO_2, CO, PM, and SO_2.[1], [2]

All criteria pollutants can have human health and environmental effects at certain concentrations. The ambient air quality standards for these pollutants (Table F) are set to public health and the environment within an adequate margin of safety (CAA § 109). Epidemiological, controlled human exposure, and toxicology studies evaluate potential health and environmental effects of criteria pollutants and form the scientific basis for new and revised ambient air quality standards.

Following is a discussion of the principal characteristics and possible health and environmental effects from exposure to the primary criteria pollutants generated by the Proposed Project.

Ozone

Ozone (O^3), or smog, is a photochemical oxidant formed when ROG and NO_X (both by-products of the internal combustion engine) react with sunlight. ROG are compounds made up primarily of hydrogen and carbon atoms. Internal combustion associated with motor vehicle usage is the major source of hydrocarbons. Other sources of ROG are emissions associated with the use of paints and solvents, the application of asphalt paving, and the use of household consumer products, such as aerosols. The two major forms of NO_X are nitric oxide (NO) and NO_2. NO is a colorless, odorless gas formed from atmospheric nitrogen and oxygen when combustion takes place under high temperature and/or high pressure. NO_2 is a reddish-brown, irritating gas formed by the combination of NO and oxygen. In addition to serving as an integral participant in ozone formation, NO_X also directly acts as an acute respiratory irritant and increases susceptibility to respiratory pathogens due to impairments to the immune system.

O^3 poses a higher risk to those who already suffer from respiratory diseases (e.g., asthma), children, older adults, and people who are active outdoors. Exposure to O^3 at certain concentrations can make breathing more difficult, cause shortness of breath and coughing, inflame and damage the airways, aggravate lung diseases, increase the frequency of asthma attacks, and cause chronic obstructive pulmonary disease. Studies show associations between short-term ozone exposure and non-accidental mortality, including deaths from respiratory issues. Studies also suggest long-term exposure to O^3 may increase the risk of respiratory-related deaths (U.S. Environmental Protection Agency 2019a). The concentration of O^3 at which health effects are observed depends on an individual's sensitivity, level of exertion (i.e., breathing rate), and duration of exposure. Studies show large individual differences in the intensity of symptomatic responses, with one study finding no symptoms to the least-responsive individual after a 2-hour exposure to 400 parts per billion of O^3 and a 50% decrement in forced airway volume in the most-responsive individual.

Although the results vary, evidence suggest that sensitive populations (e.g., asthmatics) may be affected on days when the 8-hour maximum O^3 concentration reaches 80 parts per billion (U.S. Environmental Protection Agency 2016).

In addition to human health effects, O^3 has been tied to crop damage, typically in the form of stunted growth, leaf discoloration, cell damage, and premature death. O^3 can also act as a corrosive and oxidant, resulting in property damage such as the degradation of rubber products.

Carbon Monoxide

CO is a colorless, odorless, toxic gas produced by incomplete combustion of carbon substances, such as gasoline or diesel fuel. In the Proposed Project area, high CO levels are of greatest concern during the winter, when periods of light winds combine with the formation of ground-level temperature inversions from evening through early morning. These conditions trap pollutants near the ground,

reducing the dispersion of vehicle emissions. Moreover, motor vehicles exhibit increased CO emission rates at low air temperatures. The primary adverse health effect associated with CO is interference with normal oxygen transfer to the blood, which may result in tissue oxygen deprivation. Exposure to CO at high concentrations can also cause fatigue, headaches, confusion, dizziness, and chest pain. There are no ecological or environmental effects to ambient CO (California Air Resources Board 2019).

Particulate Matter

PM consists of finely divided solids or liquids such as soot, dust, aerosols, fumes, and mists. Two forms of particulates are now generally considered: respirable particles with an aerodynamic diameter of 10 micrometers or fewer, or PM10, and fine particles with an aerodynamic diameter of 2.5 micrometers or fewer, or PM2.5. Particulate discharge into the atmosphere results primarily from industrial, agricultural, construction, and transportation activities. However, wind on arid landscapes also contributes substantially to local particulate loading. Particulate pollution can be transported over long distances and both PM10 and PM2.5 may adversely affect humans, especially for people who are naturally sensitive or susceptible to breathing problems. Numerous studies have linked PM exposure to premature death in people with preexisting heart or lung disease, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms. Depending on its composition, both PM10 and PM2.5 can also affect water quality and acidity, deplete soil nutrients, damage sensitive forests and crops, affect ecosystem diversity, and contribute to acid rain (U.S. Environmental Protection Agency 2018a).

Sulfur Dioxide

SO_2 is generated by industrial processes, natural sources such as volcanoes, and burning of fossil fuels. In recent years, emissions of SO_2 have been significantly reduced by the increasingly stringent controls placed on the sulfur content of fuels used in stationary sources and mobile sources. SO_2 is a precursor to fine PM formation in the form of sulfates, such as ammonium sulfate. Short-term exposure to SO_2 can aggravate the respiratory system, making breathing difficult. Controlled laboratory studies indicate that brief exposure (5 to 10 minutes) of exercising asthmatics to an average SO_2 level of 0.4 part per million (ppm) can result in increases in air resistance. Healthy adults do not show any symptoms resulting from SO_2 at levels as high 1 ppm, even after up to 3 hours of exposure. SO_2 can also affect the environment by damaging foliage and decreasing plant growth (U.S. Environmental Protection Agency 2019b).

Toxic Air Contaminants

Although NAAQS and CAAQS have been established for criteria pollutants, no ambient standards exist for toxic air contaminants (TACs). Many pollutants are identified as TACs because of their potential to increase the risk of developing cancer or because of their acute or chronic health risks. For TACs that are known or suspected carcinogens, the California Air Resources Board (CARB) has consistently found that there are no levels or thresholds below which exposure is risk free. Individual TACs vary greatly in the risks they present. At a given level of exposure, one TAC may pose a hazard that is many times greater than another. TACs are identified and their toxicity is studied by the California Office of Environmental Health Hazard Assessment.

Air toxics are generated by many sources, including stationary sources, such as dry cleaners, gas stations, auto body shops, and combustion sources; mobile sources, such as diesel trucks, ships, and trains; and area sources, such as farms, landfills, and construction sites. Adverse health effects of

TACs can be carcinogenic (cancer-causing), short-term (acute) non-carcinogenic, and long-term (chronic) non-carcinogenic. Direct exposure to these pollutants has been shown to cause cancer, birth defects, damage to the brain and nervous system, and respiratory disorders. The principal TAC associated with the Proposed Project is diesel particulate matter (DPM). Asbestos is typically a TAC of concern, but the Proposed Project area is not within an area of mapped ultramafic rock, and there are no mapped ultramafic rock unit areas in the vicinity (California Department of Conservation 2000). However, existing structures on the Proposed Project site are anticipated to be demolished. Therefore, asbestos would be a TAC associated with the Proposed Project area.

Diesel Particulate Matter

DPM is generated by diesel-fueled equipment, vehicles, and harbor craft. Short-term exposure to DPM can cause acute irritation (e.g., eye, throat, and bronchial), neurophysiological symptoms (e.g., lightheadedness and nausea), and respiratory symptoms (e.g., cough and phlegm). The International Agency for Research on Cancer has classified diesel engine exhaust as "carcinogenic to humans" (i.e., cancer causing) (International Agency for Research on Cancer 2012).

Asbestos

Asbestos is the name given to many naturally occurring fibrous silicate minerals. It has been mined for applications that require thermal insulation, chemical and thermal stability, and high tensile strength. It is also found in its natural state in rock or soil (known as naturally occurring asbestos, or NOA). Mapping published by the U.S. Geological Survey and California Geological Survey indicates that the Proposed Project site does not have any reported historic asbestos mines, historic asbestos prospects, asbestos-bearing talc deposits, fibrous amphiboles, or ultramafic rock outcrops. Asbestos may have been used during construction of the existing onsite buildings, however.

Odors

Offensive odors can be unpleasant and lead to citizen complaints to local governments and air districts. According to CARB's (2005) *Air Quality and Land Use Handbook*, land uses associated with odor complaints typically include sewage treatment plants, landfills, recycling facilities, manufacturing, and agricultural activities. CARB provides recommended screening distances for siting new receptors near existing odor sources.

Climate and Meteorology

The climate of the region is dominated by a cold upwelling of seawater to the ocean surface off the Humboldt Coast. This cold ocean water cools the surface air. During the summer, winds flowing from the Pacific Ocean are drawn on shore by the difference in surface temperatures, resulting in daytime northwesterly winds. In winter, this temperature differential is lower, and surface winds may blow from many directions depending on storm patterns.

As a result of the region's topography and coastal air movements, inversion conditions are common in the NCAB. Inversions are created when warm air traps cool air near the ground surface and prevents vertical dispersion of air. Valleys, geographic basins, and coastal areas surrounded by higher elevations are the most common locations for inversions to occur. During the summer, inversions are less prominent, and vertical dispersion of the air is good. However, during the cooler months between late fall and early spring, inversions last longer and are more geographically

extensive; vertical dispersion is poor, and pollution may be trapped near the ground for several concurrent days.

The mountains and hills within and surrounding the NCAB contribute to the variation of rainfall, temperature, and winds throughout the region. These variables characterize short-term weather conditions and observing long-term averages and trends in these characteristics provides a synopsis of typical climatological conditions in the NCAB. These meteorological conditions affect how air pollution from emissions sources within the NCAB moves through the air within the NCAB in the presence of other chemicals and particles. The Western Regional Climate Center—in collaboration with the National Oceanic and Atmospheric Administration—processes and publicizes regional climate summary data for the western United States. There are several meteorological stations located throughout the county that collect and record climatological data including temperature, precipitation, and wind speed and direction.

The meteorological data station most representative of local climate conditions within the study area is the Eureka WFO Woodley Island Station. The annual average temperature at the station is 53 degrees Fahrenheit (°F), with an average winter temperature of 47°F and an average summer temperature of 58°F. Total annual precipitation averages about 39 inches, occurring mostly during the winter (Western Regional Climate Center 2022). The Arcata Airport northeast of the Proposed Project area collects information on wind speeds and patterns. The data indicate a prominence of winds that average 6 miles per hour (Western Regional Climate Center 2019).

Existing Air Quality Conditions

Ambient Criteria Pollutant Concentrations

The existing air quality conditions in the Proposed Project area can be characterized by monitoring data collected in the region. Table D summarizes data for criteria air pollutant levels from the Eureka-Jacobs monitoring station, which is the only currently operating station in Humboldt County, for the last 3 years for which complete data are available (2020–2022). Air quality concentrations are expressed in terms of ppm or micrograms per cubic m (µg/m^3).

As shown in Table D, no violations of CO or NO_2 NAAQS and CAAQS were reported. However, the monitoring station has detected a few violations of the PM2.5 NAAQS and one violation of the PM10 NAAQS. As discussed above, the CAAQS and NAAQS define clean air and represent the maximum amount of pollution that can be present in outdoor air without harmful effects on people and the environment. Existing violations of the ozone and PM ambient air quality standards indicate that some individuals exposed to these pollutants may experience certain health effects, including increased incidence of cardiovascular and respiratory ailments.

Table D. Ambient Air Quality Monitoring Data from the Eureka-Jacobs Station (2020–2022)

	Eureka-Jacobs		
Pollutant Standards	**2020**	**2021**	**2022**
1-Hour Ozone (O_3)			
Maximum Concentration (ppm)	0.046	0.050	0.040
Number of Days Standard Exceeded [a]			
CAAQS 1-Hour (>0.09 ppm)	0	0	0

Pollutant Standards	Eureka-Jacobs 2020	2021	2022
8-Hour Ozone (O_3)			
State Maximum Concentration (ppm)	0.042	0.044	0.038
National Maximum Concentration (ppm)	0.041	0.044	0.037
National 4th Highest Concentration (ppm)	0.040	0.041	0.036
Number of Days Standard Exceeded [a]			
CAAQS 8-Hour (>0.070 ppm)	0	0	0
NAAQS 8-Hour (>0.070 ppm)	0	0	0
Carbon Monoxide (CO)			
Maximum 1-Hour Concentration (ppm)	1.7	0.8	1.5
Maximum 8-Hour Concentration (ppm)	1.5	0.7	1.4
Number of Days Standard Exceeded [a]			
NAAQS 8-Hour (≥9 ppm)	0	0	0
CAAQS 8-Hour (≥9.0 ppm)	0	0	0
NAAQS 1-Hour (≥35 ppm)	0	0	0
CAAQS 1-Hour (≥20 ppm)	0	0	0
Nitrogen Dioxide (NO_2)			
State Maximum 1-Hour Concentration	20	20	27
Annual Average Concentration	2	1	2
Number of Days Standard Exceeded [a]			
CAAQS 1-Hour (0.18 ppm)	0	0	0
NAAQS 1-Hour (0.10 ppm)	0	0	0
Particulate Matter (PM10) [c]			
State [c] Maximum 24-Hour Concentration	-	-	-
National [b] Maximum 24-Hour Concentration	171.5	61.9	55.0
State Annual Average Concentration [d]	-	-	-
Number of Days Standard Exceeded [a]			
CAAQS 24-Hour (>50 μg/m^3) [e]	-	-	-
NAAQS 24-Hour (>150 μg/m^3) [e]	1	0	0
Fine Particulate Matter (PM2.5)			
National[2] Maximum 24-Hour Concentration(μg/m^3)	38.8	16.2	21.2
24-hour Standard 98th Percentile (μg/m^3)	*	15.0	20.0
National Annual Average Concentration	7.7	7.4	7.4
Number of Days Standard Exceeded [a]			
NAAQS 24-Hour (>35 μg/m^3) [e]	2	0	0

Sources: California Air Resources Board 2023; U.S. Environmental Protection Agency 2023.
mg/m^3 = milligrams per cubic meter; > = greater than; ≥ = greater than or equal to; - = insufficient data

[a] An exceedance is not necessarily a violation.

[b] National statistics are based on standard conditions data. In addition, national statistics are based on samplers using federal reference or equivalent methods.

[c] State statistics are based on local conditions data, except in the South Coast Air Basin, for which statistics are based on standard conditions data. In addition, state statistics are based on California approved samplers.
[d] State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.
[e] Mathematical estimate of how many days concentrations would have been measured as higher than the level of the standard had each day been monitored. Values have been rounded.
* There was insufficient data available to determine the value.

Attainment Status

Local monitoring data (Table D) are used to designate areas as nonattainment, maintenance, attainment, or unclassified for the NAAQS and CAAQS. The four designations are further defined as follows.

- **Nonattainment**: Assigned to areas where monitored pollutant concentrations consistently violate the standard in question.
- **Maintenance**: Assigned to areas where monitored pollutant concentrations exceeded the standard in question in the past, but are no longer in violation of that standard.
- **Attainment**: Assigned to areas where pollutant concentrations meet the standard in question over a designated period of time.
- **Unclassified**: Assigned to areas where data are insufficient to determine whether a pollutant is violating the standard in question.

Table E summarizes the attainment status of the Proposed Project area in Humboldt County with respect to the NAAQS and CAAQS.

Table E. Federal and State Attainment Status of the Proposed Project Area in Humboldt County

Pollutant	NAAQS	CAAQS
Ozone	Attainment	Attainment
CO	Attainment	Attainment
PM10	Attainment	Nonattainment
PM2.5	Attainment	Attainment
SO_2	Attainment	Attainment
NO_2	Attainment	Attainment
Lead	Attainment	Attainment
Sulfates	No standard	Attainment
Visibility-Reducing Particles	No standard	Unclassified
Hydrogen Sulfide	No standard	Unclassified
Vinyl Chloride	No standard	Unclassified

Sources: California Air Resources Board 2022; U.S. Environmental Protection Agency 2023.

Sensitive Receptors

Sensitive receptors are locations where human populations, especially children, seniors, and sick persons, are found and there is reasonable expectation of continuous human exposure according to the averaging period for ambient air quality standards. Typical sensitive receptors include residences, parks, hospitals and nursing/convalescent homes, and schools and daycare centers. In general, sensitive receptors are concentrated in the cities and towns in Humboldt County. The

community of Samoa, adjacent to the Proposed Project area, contains concentrations of sensitive receptors. Sensitive receptors, such as the Peninsula Union School District and residences, are located within 1,000 feet of the Proposed Project area.

Regulatory Setting

The federal Clean Air Act (CAA) and its subsequent amendments form the basis for the nation's air pollution control effort. The U.S. Environmental Protection Agency (USEPA) is responsible for implementing most aspects of the CAA. A key element of the CAA is the NAAQS for criteria pollutants. The CAA delegates enforcement of the NAAQS to the states. In California, CARB is responsible for enforcing air pollution regulations and ensuring NAAQS and CAAQS are met. CARB, in turn, delegates regulatory authority for stationary sources and other air quality management responsibilities to local air agencies. The North Coast Unified Air Quality Management District (NCUAQMD) is the local air agency within the Proposed Project area. The following sections provide more detailed information on federal, state, and local air quality regulations that apply to the Proposed Project.

Federal

Clean Air Act

The CAA was first enacted in 1963 and has been amended numerous times in subsequent years (1965, 1967, 1970, 1977, and 1990). The CAA establishes federal air quality standards, known as NAAQS, for six criteria pollutants and specifies future dates for achieving compliance. The CAA also mandates that the states submit and implement a state implementation plan (SIP) for local areas not meeting those standards. The plans must include pollution control measures that demonstrate how the standards would be met.

The 1990 amendments to the CAA identify specific emission-reduction goals for areas not meeting the NAAQS. These amendments require both a demonstration of reasonable further progress toward attainment and incorporation of additional sanctions for failure to attain or meet interim milestones. Table F shows the NAAQS currently in effect for each criteria pollutant, as well as the CAAQS (discussed further below).

Table F. Federal and State Ambient Air Quality Standards

		California [d]	National Standards [a]	
Criteria Pollutant	**Average Time**	**Standards**	**Primary**	**Secondary**
Ozone	1-hour	0.09 ppm	None [b]	None [b]
	8–hour	0.070 ppm	0.070 ppm	0.070 ppm
Particulate Matter (PM10)	24-hour	50 μg/m^3	150 μg/m^3	150 μg/m^3
	Annual mean	20 μg/m^3	None	None
Fine Particulate Matter (PM2.5)	24-hour	None	35 μg/m^3	35 μg/m^3
	Annual mean	12 μg/m^3	12.0 μg/m^3	15 μg/m^3
Carbon Monoxide	8-hour	9.0 ppm	9 ppm	None
	1-hour	20 ppm	35 ppm	None
Nitrogen Dioxide	Annual mean	0.030 ppm	0.053 ppm	0.053 ppm
	1-hour	0.18 ppm	0.100 ppm	None

Criteria Pollutant	Average Time	California [d] Standards	National Standards [a] Primary	National Standards [a] Secondary
Sulfur Dioxide [c]	Annual mean	None	0.030 ppm	None
	24-hour	0.04 ppm	0.14 ppm	None
	3-hour	None	None	0.5 ppm
	1-hour	0.25 ppm	0.075 ppm	None
Lead	30-day Average	1.5 μg/m^3	None	None
	Calendar quarter	None	1.5 μg/m^3	1.5 μg/m^3
	3-month average	None	0.15 μg/m^3	0.15 μg/m^3
Sulfates	24-hour	25 μg/m^3	None	None
Visibility-reducing Particles	8-hour	-[d]	None	None
Hydrogen Sulfide	1-hour	0.03 ppm	None	None
Vinyl Chloride	24-hour	0.01 ppm	None	None

Source: California Air Resources Board 2016.

ppm = parts per million; μg/m^3 = micrograms per cubic meter; SO_2 = sulfur dioxide.

[a] National standards are divided into primary and secondary standards. Primary standards are intended to protect public health, whereas secondary standards are intended to protect public welfare and the environment.

[b] The federal 1-hour standard of 12 parts per hundred million was in effect from 1979 through June 15, 2005. The revoked standard is referenced because it was employed for such a long period and is a benchmark for SIPs.

[c] The annual and 24-hour NAAQS for SO_2 only apply for 1 year after designation of the new 1-hour standard to those areas that were previously in nonattainment for 24-hour and annual NAAQS.

[d] CAAQS for visibility-reducing particles is defined by an extinction coefficient of 0.23 per kilometer – visibility of 10 miles or more due to particles when relative humidity is less than 70 percent.

Non-Road Diesel Rule

USEPA has established a series of increasingly strict emission standards for new off-road diesel equipment, on-road diesel trucks, and locomotives. New equipment used for program activities, including heavy-duty trucks and off-road construction equipment, would be required to comply with the emission standards.

Vehicle Emissions Standards

The National Highway Traffic Safety Administration (NHTSA) and USEPA set corporate average fuel economy (CAFE) standards for passenger cars and for light trucks (collectively, light-duty vehicles), and separately sets fuel consumption standards for medium- and heavy-duty trucks and engines. The current CAFE standards require an industry-wide fleet average of approximately 49 miles per gallon (mpg) for passenger cars and light trucks in model year 2026, by increasing fuel efficiency by 8% annually for model years 2024 and 2025, and 10% annually for model year 2026. Phase 2 of the "Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles" applies to model years 2019 through 2027 medium- and heavy-duty vehicles.

On April 12, 2023, USEPA proposed two new federal vehicle standards that will build on the existing CAFE and Phase 2 standards. The "Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium Duty Vehicles" proposes more stringent emission standards for light-duty and medium-duty vehicles for model years 2027 through 2032 and accelerates the deployment of electric- and clean-vehicles. The "Greenhouse Gas Standards for Heavy-Duty Vehicles - Phase 3" establishes fleet mix performance standards for vocational vehicles (e.g., delivery trucks) and trucks typically used to haul freight.

State

California Clean Air Act

In 1988, the state legislature adopted the California Clean Air Act (CCAA), which established a statewide air pollution control program. The CCAA requires all air districts in the state to endeavor to meet the CAAQS by the earliest practical date. Unlike the CAA, the CCAA does not set precise attainment deadlines. Instead, the CCAA establishes increasingly stringent requirements for areas that would require more time to achieve the standards. CAAQS are generally more stringent than NAAQS and incorporate additional standards for sulfates, hydrogen sulfide, visibility-reducing particles, and vinyl chloride. The CAAQS and NAAQS are shown in Table F.

CARB and local air districts bear responsibility for meeting the CAAQS, which are to be achieved through district-level air quality management plans incorporated into the SIP. In California, USEPA has delegated authority to prepare SIPs to CARB, which, in turn, has delegated that authority to individual air districts. CARB traditionally has established state air quality standards, maintaining oversight authority in air quality planning, developing programs for reducing emissions from motor vehicles, developing air emission inventories, collecting air quality and meteorological data, and approving SIPs.

The CCAA substantially adds to the authority and responsibilities of air districts. The CCAA designates air districts as lead air quality planning agencies, requires air districts to prepare air quality plans, and grants air districts authority to implement transportation control measures. The CCAA also emphasizes the control of "indirect and area-wide sources" of air pollutant emissions. The CCAA gives local air pollution control districts explicit authority to regulate indirect sources of air pollution and to establish traffic control measures.

Statewide Truck and Bus Regulation

CARB adopted the Truck and Bus Regulation in 2008 to focus its efforts on reducing emissions of DPM, NO_X, and other criteria pollutants from diesel-fueled vehicles. This regulation applies to any diesel-fueled vehicle as well as any dual-fuel or alternative-fuel diesel vehicle that travels on public highways; yard trucks with on-road engines; yard trucks with off-road engines used for agricultural operations; school buses; and vehicles with a gross vehicle weight rating (GVWR) of more than 14,000 pounds. The purpose of the regulation is to require trucks and buses registered in the state to have 2010 or newer engines by 2023. Compliance schedules have been established for lighter vehicles (GVWR of 14,000–26,000 pounds) and heavier vehicles (GVWR of more than 26,001 pounds) (California Air Resources Board 2020). As of January 1, 2020, only vehicles that met the requirements of the Trucks and Bus Regulation were allowed to register with the California Department of Motor Vehicles.

Statewide Advanced Clean Truck Regulation

CARB adopted the Advanced Clean Truck Regulation in June 2020 to accelerate a large-scale transition of zero-emission medium-and-heavy-duty vehicles. The regulation requires the sale of zero-emission medium-and-heavy-duty vehicles as an increasing percentage of total annual California sales from 2024 to 2035. By 2035, zero-emission truck/chassis sales would need to be 55% of Class 2b–3 truck sales, 75% of Class 4–8 straight truck sales, and 40%of truck tractor sales. By 2045, every new medium-and-heavy-duty truck sold in California would be zero-emission. Large employers including retailers, manufacturers, brokers, and others are required to report

information about shipments and shuttle services to better ensure that fleets purchase available zero-emission trucks.

State Tailpipe Emission Standards

Like USEPA at the federal level, CARB has established a series of increasingly strict emission standards for new off-road diesel equipment, on-road diesel trucks, and harbor craft operating in California. New equipment used for Proposed Project activities would be required to comply with the standards.

Carl Moyer Program

The Carl Moyer Memorial Air Quality Standards Attainment Program is a voluntary program that offers grants to owners of heavy-duty vehicles and equipment. The Proposed Project is a partnership between CARB and the local air districts throughout the state to reduce air pollution emissions from heavy-duty engines. Locally, the air districts administer this program.

Toxic Air Contaminant Regulations

California regulates TACs primarily through the Toxic Air Contaminant Identification and Control Act (Tanner Act) and the Air Toxics "Hot Spots" Information and Assessment Act of 1987 ("Hot Spots" Act). In the early 1980s, CARB established a statewide comprehensive air toxics program to reduce exposure to air toxics. The Tanner Act created California's program to reduce the public's exposure to air toxics. The "Hot Spots" Act supplements the Tanner Act by requiring a statewide air toxics inventory, notification for people who were exposed to a significant health risk, and facility plans to reduce risks.

In August 1998, CARB identified DPM from diesel-fueled engines as a TAC. In September 2000, CARB approved a comprehensive Diesel Risk Reduction Plan to reduce emissions from both new and existing diesel-fueled engines and vehicles. Implementation of ATCMs has helped reduce statewide DPM concentrations substantially. CARB plans to continue its efforts to reduce DPM emissions and estimates that, by 2035, DPM emissions will be less than half of what they were in 2010.

Regional and Local

North Coast Unified Air Quality Management District

At the regional level, responsibilities of air quality districts include overseeing stationary-source emissions, approving permits, maintaining emissions inventories, maintaining air quality stations, overseeing agricultural burning permits, and reviewing air quality–related sections of environmental documents required by CEQA. The air quality districts are also responsible for establishing and enforcing local air quality rules and regulations that address the requirements of federal and state air quality laws and for ensuring that NAAQS and CAAQS are met.

The Proposed Project area is located in the NCAB and within the Proposed Project area, NCUAQMD is tasked with preparing regional programs and policies designed to improve air quality. The NCUAQMD has published a study titled *1995 PM10 Attainment Plan*, which presents available information about the nature and causes of exceedances of standards for respirable PM10, and to identify cost-effective control measures that can be implemented to bring ambient PM10 levels down (North Coast Unified Air Quality Management District 2019).

In addition, NCUAQMD develops and adopts various rules to reduce emissions throughout the NCAB and implement the *1995 PM10 Attainment Plan* (Davis pers. comm.). The Proposed Project may be subject to the following district rules. This list of rules may not be all encompassing, as additional NCUAQMD rules may apply as specific program details are further developed.

- **Rule 104** (Prohibitions) establishes general limitations related to public nuisances, particulate matter, fugitive dust emissions, and sulfur oxide emissions.
- **Rule 110** provides for no net increase in emissions, pursuant to Section 40918 of the Health and Safety Code, from new or modified stationary sources that emit, or have the potential to emit, 25 tons per year or more of any nonattainment pollutant or its precursors.
- **Rule 300** (State Airborne Toxic Control Measures) incorporates California State Air Toxic Control Measures per Health and Safety Code Section 39666.

Humboldt Bay Harbor, Recreation, and Conservation District

The Humboldt Bay Harbor, Recreation, and Conservation District manages Humboldt Bay for the promotion of commerce, navigation, fisheries, and recreation, and the protection of natural resources. The *Humboldt Bay Management Plan* aims to ensure compliance with NCUAQMD rules for particulates (Policy HTM-3) (Humboldt Bay Harbor, Recreation, and Conservation District 2007).

Humboldt County

The *Humboldt County General Plan* Air Quality, Circulation, and Land Use Elements contain policies related to air quality that are relevant to the Proposed Project. The Air Quality Element identifies goals, policies, and standards that are meant to balance Humboldt County's actions regarding land use, circulation, and other issues with their potential effects on air quality (Humboldt County 2017). In summary, relevant policies are concerned with supporting NCUAQMD rules and the *1995 PM10 Attainment Plan*, buffering sensitive receptors from pollution sources, and controlling and reducing particulate matter emissions. Relevant policies are as follows.

- **AQ-P1. Reduce Length and Frequency of Vehicle Trips**. Reduce the length and frequency of vehicle trips through land use and transportation policies by encouraging mixed-use development, compact development patterns in areas served by public transit, and active modes of travel.
- **AQ-P2. Reduce Localized Concentrated Air Pollution**. Reduce or minimize the creation of "hot spots" or localized places of concentrated automobile emissions.
- **AQ-P4. Construction and Grading Dust Control**. Dust control practices on construction and grading sites would achieve compliance with NCAQMD fugitive dust emission standards.
- **AQ-P5. Air Quality Impacts from New Development**. During environmental review of discretionary permits, reduce emissions of air pollutants from new commercial and industrial development by requiring feasible mitigation measures to achieve the standards of the NCAQMD.
- **AQ-P6. Buffering Land Uses**. During environmental review of discretionary commercial and industrial projects, consider the use of buffers between new sources of emissions and adjacent land uses to minimize exposure to air pollution.
- **AQ-P7. Interagency Coordination**. Coordinate with the NCAQMD early in the permit review process to identify expected regulatory outcomes and minimize delays for projects involving:

- CEQA environmental review;
- Building demolition projects that may involve removal of asbestos-containing material subject to National Emission Standards for Hazardous Air Pollutants; and
- Grading and mining operations subject to State Airborne Toxic Control Measures for naturally occurring asbestos.
- Rely on the air quality standards, permitting processes, and enforcement capacity of the NCAQMD to define thresholds of significance and set adequate mitigations under CEQA to the maximum extent allowable.

Discussion

a. Conflict with or obstruct implementation of the applicable air quality plan?

The EIR will qualitatively evaluate the Project's consistency with state and local air quality and climate change plans and regulations, including the PM10 Attainment Plan.

b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an applicable federal or state ambient air quality standard?

Criteria pollutant emissions will be compared to NCUAQMD thresholds to analyze the potential for significant air quality impacts.

c. Expose sensitive receptors to substantial pollutant concentrations?

A quantitative health risk assessment (HRA) will estimate the levels of health risk exposure from diesel particulate matter at existing and future planned sensitive land uses within 1,000 feet of primary shipping routes and the terminal and compared to NCUAQMD thresholds. A qualitative assessment will be discussed for the potential for offsite receptors to be exposed to asbestos from demolition of existing docks and buildings.

d. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

A qualitative assessment will be discussed for the potential for offsite receptors to be exposed to odors based on guidance from NCUAQMD and compliance with any applicable rules and regulations.

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IV. Biological Resources

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:					
a.	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☒	☐	☐	☐
b.	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☒	☐	☐	☐
c.	Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marshes, vernal pools, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means?	☒	☐	☐	☐
d.	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☒	☐	☐	☐
e.	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☒	☐	☐	☐
f.	Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

Affected Environment

Terrestrial Overview

The Proposed Project area has a long history of industrial lumber production that has resulted in significant grading, infilling, and development of previous intertidal and dune lands along the Humboldt Bay shoreline. This included multiple lumber mill facilities operating concurrently and at different times across the Proposed Project area. Because of this, much of the Project area is dominated by large expanses of unvegetated pavement, ruderal vegetation, and other areas with a mix of non-native and native vegetation. However, several sensitive natural communities occur within highly manipulated situations on compacted gravels or other formerly developed areas;

while others occur as remnants of habitat that existed prior to development. The Proposed Project area consists of a mix of coastal dunes and coastal scrub, willow thickets, beach pine forest, salt marsh, and marine shoreline in patchy distribution among asphalt and other paved surfaces, as well as ruderal and non-native-dominated patches of vegetation throughout a previously developed area.

Sensitive natural communities and other non-wetland habitats considered Environmentally Sensitive Habitat Areas (ESHA) with predominantly natural conditions occur throughout the Proposed Project area, totaling 10.62 acres, supporting a mix of native and non-native species and habitat conditions (SHN 2024a). ESHA, as defined by the Coastal Act Section 30107.5, are habitats that are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments.

Common wildlife species expected within the Proposed Project area are those typically associated with coastal scrub and dunes, riparian areas, shorelines, and urban settings of northwestern California. Although the Proposed Project area is disturbed and previously developed, much of the site is abandoned and regrowth of vegetation throughout provide food and shelter for animals, including previous drainage features. Multiple dock facilities were historically constructed along the Humboldt Bay waterfront for shipping finished products and receiving raw materials, as well as for water intake structures. Remnants of these structures remain and provide nesting and roosting habitat for wildlife (SHN 2024a).

Several special-status plant and animal species have been reported to occur in the vicinity of the Proposed Project area, some of which were observed or detected during site investigations (SHN 2024a).

The Project is sited along the shore of Humboldt Bay, which is along the Pacific Flyway, the route taken by migrating shorebirds and waterfowl twice each year. The marshes and mudflats of Humboldt Bay provide important feeding and roosting habitat for these migrating birds. The Western Hemisphere Shorebird Reserve Network (WHSRN) recognizes Humboldt Bay as a "Site of International Importance" for shorebirds. Humboldt Bay is the primary waterbird migration stopover and wintering area between the Columbia River in Oregon and San Francisco Bay.

Shorebirds, waterfowl and brant are dependent on existing intertidal mudflats and their contributions to subtidal habitat. Humboldt Bay supports a rich shorebird species assemblage, largely because of the diverse foraging habitats such as sandy beaches, rocky intertidal zones, intertidal flats and seasonal wetlands. Their distribution typically reflects the abundance of available prey. Shorebirds generally depart from roosts to feed in intertidal mudflats, and as high tides inundate mudflats, they return to their roosts. Non-breeding shorebird species use intertidal mudflat areas of Humboldt Bay to forage although habitat use is different based on the species' morphology, habitat conditions, and substrate type.

Undeveloped lands on the Samoa Peninsula are typically undulating, reflecting the aeolian sand deposits (coastal dunes) that characterize the area. The primary sources of wetland hydrology in the Proposed Project area are direct precipitation and runoff, surface water, tidal, and coastal fog. The Proposed Project area is located within the Humboldt Bay/Eureka plain watershed (hydrologic unit code 18010102602). No streams occur within the Proposed Project area, as it occurs on a peninsula of land less than a mile wide and is composed of well-drained aeolian soil (SHN 2024b).

Naturally occurring wetlands within the Proposed Project area are typically salt marsh or deflation plain wetlands that exist on the leeward side of dunes as a result of wind-driven sand movement. A

combination of topography, high water table, chemical bonding of sandy soils in deflation plains, and low evapotranspiration rates allow for the development of wetland conditions in these topographic low points. The majority of the deflation plain wetlands are isolated and do not have aboveground connectivity to Traditional Navigable Waterways (TNW). Additionally, anthropogenic disturbance has led to the establishment of additional wetlands through soil compaction, grading, asphalt, imported soil and concrete placement, and other means, which has resulted in artificial wetlands and artificially induced wetlands (SHN 2024b).

Two Estuarine Intertidal areas exist in the Proposed Project area with a total length of 12,272 feet (2.324 miles) along Humboldt Bay. A total of 226,415 square feet (5.198 acres) of Estuarine Intertidal Shoreline occurs within the Proposed Project area (SHN, 2023).

Marine Overview

Humboldt Bay supports a range of spatially defined ecological communities, including eelgrass, mudflats and subtidal regions, and channels. Each community contributes to the overall function of Humboldt Bay, provides a set of ecological services and supports a different species assemblage. The substrate, depth, and tidal and marine influence are three (of many) characteristics that define a given community.

Humboldt Bay is relatively shallow, with the majority of the bay comprised of tidal flats that are exposed during low tide. The mud flats are predominately in North and South Bays, and only Entrance Bay and the lower portions of North Bay Channel maintain an approximate constant surface area over a tide cycle. The sediments in Humboldt Bay vary, but they correlate to the bay floor types: mudflats, tidal channels, salt marshes that are located primarily by the tidal elevations. Currents leave coarser sediments in the channels and finer sediments in the mudflats (HT Harvey 2022). The nearby Eel River is a major source of sediment entering the bay from the ocean. Humboldt Bay habitats were evaluated, with 31 percent of the bay comprised of eelgrass or patchy eelgrass, 28 percent of the bay comprised of subtidal habitat, followed by 21 percent unconsolidated sediment, and 12 percent macroalgae (HT Harvey 2022).

Extensive areas of common eelgrass (*Zostera marina*) habitat occur in the Proposed Project Area. Eelgrass is a Habitat Area of Particular Concern (HAPC) in Humboldt Bay. Eelgrass (*Zostera marina* is the native local species) is a flowering plant, adapted to live in shallow subtidal and intertidal zones, primarily found near the level of mean low water or at tidal elevations between -21 to 0.8 meters (m). Eelgrass thrives in muddy to silty sediment and is an important marine habitat in Humboldt Bay. Eelgrass provides a multitude of ecosystem services including physical, chemical, and biological services, and is important as nursery and foraging habitat for numerous aquatic and terrestrial species. Humboldt Bay accounts for over 30 percent of the total eelgrass habitat in California, and contains the largest population in the state at an estimated 4,700 acres. Eelgrass is considered the most important contributor to primary productivity within Humboldt Bay (HT Harvey 2022).

Intertidal mudflats are the habitats exposed by medium to low tides and comprise roughly two-thirds of Humboldt Bay. They are normally gently sloping seabeds, found in more sheltered parts of Humboldt Bay. At high tide, mudflats provide nursery grounds for fish, and at lower tides, are important resting (and foraging) areas for migrating and wintering birds. Mudflats also support a diversity of invertebrates, primarily a range of polychaetes, crustaceans and mollusks. Mudflats are often intersected by channels (HT Harvey 2022). Mudflats in the bay are extensively channelized by tidewater flow, with some channels supporting eelgrass. During high tides, fish, including special-

status species, and marine mammals may occur in intertidal areas and utilize them as foraging habitat. Various invertebrate species including Dungeness crab can also occur in intertidal areas during high and low tides. Additionally, mudflats are highly productive foraging habitat for many bird species and protect inland landforms from erosion by acting as a barrier to waves.

The tidal marsh community of Humboldt Bay is composed of herbaceous vegetation that is periodically inundated by tidal waters and drained by a system of meandering slough channels. Tidal marsh is typically saline to brackish; however, the extent of tidal influence can extend further inland than saltwater intrusion, therefore these habitats can also support some freshwater species. Diking and filling of salt marsh around the bay in the late nineteenth and early twentieth centuries resulted in a loss of approximately 90 percent of historic tidal marsh.

The channels in Humboldt Bay are responsible for transporting incoming and outgoing tidal flows and are characterized by sand, with the walls being comprised of more clay and sandy/silty material. Deeper channels are significantly more turbulent and contain coarser benthic sediment compared to the upper reaches of channels, where water flow is decreased and benthic substrate is finer. Channels serve as a water reservoir at low tide and are regularly used by marine and resident fish for foraging and as nursery grounds. The deepest and widest channels are at Entrance Bay and the entrance to North and South Bays. The channels in North and South Bays then taper into smaller, shallower and more complex channels that dissect the intertidal mudflats (HT Harvey 2022).

Special-Status Species and Habitats

The Humboldt Bay area hosts over 400 plant species, 500 invertebrate species, 100 fish species, and 260 bird species, including those that rely on the bay as they travel the Pacific Flyway. Humboldt Bay is also important in the life cycles of commercially and recreationally important fish species including shellfish, crustaceans, and finfish.

This IS focuses on plant and animal species and habitats that:

- Are likely to occur within or adjacent to Proposed Project Area and potentially be affected by project development; and
- Are listed under Federal Endangered Species Act (FESA) or California Endangered Species Act (CESA); or
- Are listed as a Species of Special Concern or Fully Protected Species by the State of California; or
- Are a plant species ranked by the California Native Plant Society as Rank 2 or rarer; or
- Are marine mammals (due to their protection under the Marine Mammal Protection Act [MMPA]).

These species and habitats are referred to as *special status*.

Wetlands and Waters of the State

A total of 1.915 acres of wetlands and 5.198 acres of non-wetland waters were identified in the survey area as potentially meeting the criteria of Clean Water Act (CWA) Section 401 and waters of the state, under the jurisdiction of the Regional Water Quality Control Board. A total of 1.915 acres of wetlands, 5.977 acres of non-wetland waters (which includes one- and two-parameter coastal features), were identified in the survey area as potentially meeting the criteria of the California Coastal Act (CCA), under the jurisdiction of the California Coastal Commission (see Table G. Note:

Figures are included in SHN 2024b)). There are no features identified in the survey area as potentially meeting the criteria of California Fish and Game Code (CFGC) Sections 1600–1607, under the jurisdiction of the California Department of Fish and Wildlife (SHN 2024b).

A total of 27 wetlands occur in the Proposed Project area comprised of: Palustrine Forested Wetlands (4), Palustrine Scrub-shrub Wetlands (12), Palustrine Emergent Wetlands (3), Estuarine Wetlands associated with Humboldt Bay (5), and Artificial Aquatic features (3) (SHN 2024b).

Table G. State Aquatic Resources Summary Table

Aquatic Resource Type	Area within Study Area (acres)	Length within Study Area (linear feet)	401 (acres)	1600–1607 (acres)	CCA (acres)
Wetlands					
Palustrine Forested Wetland	0.187	N/A	0.187	0	0.187
Palustrine Scrub-Shrub Wetland	0.297	N/A	0.297	0	0.297
Palustrine Emergent Wetland	0.066	N/A	0.066	0	0.066
Estuarine Wetland	0.813	N/A	0.813	0	0.813
Artificial Aquatic Features	0.552	N/A	0.552	0	0.552
Wetlands Subtotal	1.915	N/A	1.915	0	1.915
Non-Wetland Waters					
Estuarine Intertidal Shoreline	5.198	12,272	5.198	0	5.198
Other Waters of the State	0.780	N/A	0	0	0.780
Non-Wetland Waters Subtotal	5.977	12,272	5.198	0	5.977
Total Wetlands and Waters	7.892	12,272	7.113	0	7.892

Wetlands and Waters of the US

A total of 59,383 square feet (1.363 acres) of three-parameter wetlands occur in the Proposed Project area, of which 43,163 square feet (0.991 acres) are adjacent to a TNW and are potentially jurisdictional waters. An additional 16,220 square feet (sq ft; 0.372 acres) are not adjacent to a TNW and are potentially non-jurisdictional waters (see Table H. Note: Figures are included in SHN 2024b). Three Palustrine Wetland types occur in the Proposed Project area: Palustrine Forested Wetlands, Palustrine Scrub-shrub Wetlands, and Palustrine Emergent Wetlands. In addition, Estuarine Wetlands occur within the Proposed Project area associated with Humboldt Bay. A total of 24 wetlands occur in the Proposed Project area. Of these, four are Palustrine Forested Wetlands, 12 are Palustrine Scrub-shrub Wetlands, three are Palustrine Emergent Wetlands, and five are Estuarine Wetlands. There is a total of 5.198 acres of non-wetland waters (intertidal waters below the Mean Higher High Water [MHHW]) that potentially meet the criteria of waters of the U.S. (SHN, 2023).

Table H. Waters of the U.S. Summary

Aquatic Resource Type	Area (acres)	Adjacent to a TNW (acres)	Length (linear feet)
Wetlands			
Palustrine Forested Wetland	0.187	0.077	N/A
Palustrine Scrub-Shrub Wetland	0.297	0.048	N/A
Palustrine Emergent Wetland	0.066	0.052	N/A
Estuarine Wetland	0.813	0.813	N/A
Wetlands Subtotal	1.363	0.991	N/A
Non-Wetland Waters			
Estuarine Intertidal	5.198	5.198	12,272
Total Waters of the U.S.	6.561	6.189[a]	12,272

Sensitive Natural Communities

Sensitive natural communities, as defined by California Department of Fish and Wildlife (CDFW), are natural communities with state rarity ranks of S1-S3, as follows.

- **S1** – Critically Imperiled in the state because of extreme rarity (often five or fewer populations) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state
- **S2** – Imperiled in the state because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the state
- **S3** – Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation from the state

Of the natural communities occurring in the study area, ten (10) were determined to be sensitive natural communities and are therefore considered ESHA (see Table I. Note: Figures are included in SHN 2024b). These ESHA totaling 10.5 acres are as follows:

- Coast dune willow-Sitka willow thickets (5.30 acres; *Salix hookeriana* - *Salix sitchensis* - *Spiraea douglasii* Shrubland Alliance; G4 S3): *Salix hookeriana* Association, *Salix hookeriana* / Rubus ursinus Association, *Salix sitchensis* Association
- Wax myrtle scrub (1.81 acres; *Rubus spectabilis* - *Morella californica* Shrubland Alliance; G4 S3): *Morella californica-Rubus* spp.
- Beach pine forest and woodland (0.62 acres; *Pinus contorta* ssp. *contorta* Forest and Woodland Alliance; G5 S3): *Pinus contorta* ssp. *contorta* Association
- Shining willow groves (0.55 acres; *Salix lasiandra*[1] ssp. *lasiandra* Forest and Woodland Alliance; G4 S3.2): *Salix lasiandra* ssp. *lasiandra* Association

[1] Called *Salix lucida* ssp. *lasiandra* in the Manual of California vegetation. This follows the Jepson Manual naming.

- Seaside woolly-sunflower - seaside daisy - buckwheat patches (0.44 acres; *Eriophyllum staechadifolium* – Erigeron glaucus - *Eriogonum latifolium* Herbaceous Alliance; G3 S3)
- Pickleweed mats (0.12 acres; *Sarcocornia pacifica* [*Salicornia depressa*] Herbaceous Alliance; G4 S3): *Sarcocornia pacifica - Jaumea carnosa - Distichlis spicata* Association
- Soft and western rush - Sedge marshes (0.02 acres; *Juncus* [*effusus*, *patens*] - *Carex* [*pansa*, *praegracilis*] Herbaceous Alliance; G4 S3S4): *Carex pansa* Association, *Carex pansa - Baccharis pilularis* Association
- Slough sedge - Water-parsley - Small-fruited bulrush marsh (0.01 acres; *Carex obnupta - Oenanthe sarmentosa - Scirpus microcarpus* Herbaceous Alliance; G4 S3): *Argentina egedii* (*Potentilla anserina* ssp. *pacifica*) Association
- Mid-high elevation salt marsh (1.26 acres; undescribed vegetation assemblage)
- Low elevation salt marsh (0.37 acres; undescribed vegetation assemblage)

Other ESHA

ESHA includes non-vegetated areas, or habitat defined by conditions other than vegetation composition. Within the Proposed Project area, this includes dune remnants dominated by non-native species. Dune remnant ESHA represents areas of aeolian sand deposits that remain from historic sand dunes that once occurred within the Proposed Project area. Within these areas, the sandy soils are still intact but do not support native sand dune vegetation and are currently dominated almost exclusively by non-native and invasive species, reflecting the history and extent of past disturbance. These areas do not meet the definition of a sensitive natural community but still represent habitat for sensitive dune-dependent vegetation communities and special-status species and is therefore considered ESHA. Most of the historic dunes and dune habitat has been removed for past development of the site. Approximately 5,111.25 square feet (0.12 acre) of dune remnant ESHA occurs within the Proposed Project area (see Table I; SHN 2024a; Note: Figures are included in SHN 2024b).

Table I: Non-Wetland ESHA within the Study Area

Non-Wetland ESHA Type	Total Area (acres)
Sensitive Natural Communities	
coastal dune willow-Sitka willow thickets	5.30
wax myrtle scrub	1.81
mid-high-elevation salt marsh	1.26
beach pine forest and woodland	0.62
shining willow groves	0.55
seaside woolly-sunflower - seaside daisy - buckwheat patches	0.44
low elevation salt marsh (spartina and salt grass dominant)	0.37
pickleweed mats	0.12
soft and western rush - sedge marshes	0.02
slough sedge - water-parsley - small-fruited bulrush marsh	0.01
Total Sensitive Natural Communities	10.50

Non-Wetland ESHA Type	Total Area (acres)
Other ESHA	
dune remnant	0.12
Total Other ESHA	0.12
Total Non-Wetland ESHA within the Study Area:	10.62

Terrestrial Botanical Species

A list of special-status species with the potential to occur in the Proposed Project Area was developed using California Natural Diversity Database (CNDDB), California Native Plant Society (CNPS), and U.S. Fish and Wildlife Service (USFWS) queries. If a species' required habitat does not occur in or near the Proposed Project Area, and if the Proposed Project Area is outside the species' known distribution or elevation range, the species was considered not likely to occur. Based on the literature review, 26 special-status plant species have the potential to occur within the terrestrial portion of the Proposed Project Area. Table J describes these species in more detail.

Protocol-level botanical surveys were conducted by SHN in 2020 and 2022 (SHN 2024a). Two special-status[2] California Rare Plant Rank (CRPR) 1B species and one CRPR 4 species were observed within the Proposed Project area. This included four occurrences[3] of Point Reyes bird's beak (*Chloropyron maritimum* ssp. *palustre*; CRPR 1B.2); one occurrence of Humboldt Bay owl's clover (*Castilleja ambigua* var. *humboldtiensis*; CRPR 1B.2); and three occurrences of sea coast angelica (*Angelica lucida*; CRPR 4.2; SHN 2024a).

Point Reyes bird's beak (CRPR 1B.2) is considered rare, threatened, or endangered in California and elsewhere, and is moderately threatened in California. This species is an annual hemi-parasitic herb in the Orobanchaceae family with pinkish purple flowers that typically bloom between June and October. Point Reyes bird's beak typically grows in coastal salt marsh from 0-35 feet but is most common around the high tide line which experiences regular tidal inundation by brackish water. This species is differentiated from other *Chloropyron* species and *Chloropyron maritimum* subspecies by four fertile stamens and entire or notched inner brackets and a stem that has zero branches or few branches that are less than or equal to the central spike.

Point Reyes bird's beak is distributed along the California coastline, but is concentrated around the San Francisco Bay area and the Humboldt Bay area with other scattered observations on the coast. Its distribution stretches from San Luis Obispo County in the south to southwestern Oregon in the north and is State listed as endangered in Oregon. Many local observations in salt marsh around Humboldt Bay are recorded and it can be locally abundant where conditions are right. This species was historically much more common in proper habitat but has been reduced by development and salt marsh alteration. CNPS lists several ongoing threats for this species, including foot traffic and trampling, non-native plants, and cattle grazing with foot traffic and associated trampling as impacting the greatest percentage of populations.

[2] Special-status as defined in this report and the *Protocols for Surveying and Evaluating Impacts to Special-status Native Plant Populations and Sensitive Natural Communities* (CDFW, 2018a).

[3] Occurrence is informally defined here as a single individual or patches of individuals of a given species generally separated by at least 98 feet (30 meters) from another individual or patch of the same species. This definition differs from the CNDDB definition of an occurrence (see CNDDB Management Framework, dated 7/28/2020).

Three occurrences of Point Reyes bird's beak were recorded within the study area in 2020 and 2022 (Note: Figures are included in SHN 2024b).

- Occurrence 1 was the largest occurrence comprised of several thousand individuals in 10 polygons and 11 scattered individuals over a 930-foot stretch of salt marsh along Humboldt Bay. All individuals and polygons that make up Occurrence 1 were within 100 feet of another. In total, Occurrence 1 populations cover approximately 1,801 square feet of salt marsh in the northern portion of the Proposed Project area.
- Occurrence 2 consisted of two polygons containing an estimated 500 individuals within salt marsh in a slough between the railroad and Vance Avenue. This occurrence is within 100 feet of Occurrence 1 at its nearest point; however it is separated by the railroad fill prism and hydrologically, the slough connects to Humboldt Bay approximately 750 feet north of this population, therefore it is considered a different occurrence. In total, Occurrence 2 populations cover approximately 561 square feet of salt marsh in the northern portion of the Proposed Project area.
- Occurrence 3 consisted of one isolated individual approximately 200 feet south of Occurrence 1 at its nearest point within salt marsh along Humboldt Bay. This individual is the southernmost extent of Point Reyes bird's beak within the study area and is approximately 0.25 mile south of the northernmost occurrence within the Proposed Project area.

Site quality was good for all three occurrences due to the presence of high-quality mid elevation salt marsh habitat within the northern portion of the Proposed Project area, although this salt marsh likely represents a small portion of what was historically present. It should be noted that extensive salt marsh north of the study area supports thousands of individuals, as noted during reconnaissance site visits of the area. Common associated species included salt grass (*Distichlis spicata*), marsh jaumea (*Jaumea carnosa*), annual pickleweed (*Salicornia depressa*), arrow grass (*Triglochin maritima*), and perennial pickleweed (*Salicornia pacifica*), among others.

Humboldt Bay owl's clover (CRPR 1B.2) is considered rare, threatened, or endangered in California and elsewhere and is moderately threatened in California. This species is an annual hemi-parasitic herb in the Orobanchaceae family with somewhat showy purple flowers that typically bloom between April and August. Humboldt Bay owl's clover typically grows in coastal salt marsh from 0-10 feet but is most common around the high tide line which experiences regular tidal inundation by brackish water. This species is differentiated from other annual *Castilleja* species by three bract lobes that are white or pale yellow and seeds less than 1 millimeter (mm) with a shallow coat. It is further differentiated from other *Castilleja ambigua* varieties by being fleshy, having zero to few branches and by its occurrence in and adaptation to salt marsh habitat.

Humboldt Bay owl's clover is endemic to California and is distributed along the California coastline but is most concentrated in the Humboldt Bay area with other scattered observations along the coast. Its distribution stretches from Humboldt Lagoons State Park in the north to Tomales Bay in the south. Many local observations in salt marsh around Humboldt Bay are recorded and it can be locally abundant where conditions are right. This species was historically much more common in proper habitat but has been reduced by development and salt marsh alteration. CNPS lists several ongoing threats for this species including coastal development, foot traffic and trampling, and non-native plants with development and foot traffic and associated trampling as impacting the greatest percentage of populations.

One occurrence of Humboldt Bay owl's clover was recorded within the study area in 2020 and 2022 (Note: Figures are included in SHN 2024b). This occurrence consisted of two populations comprised of over 100 individuals mapped within two discrete polygons covering 562 square feet. This occurrence was located within mid-level salt marsh in a slough between the railroad and Vance Avenue. It has a very similar spatial distribution and location to Point Reyes bird's beak Observation 2.

Site quality was good for this occurrence of Humboldt Bay owl's clover due to high-quality mid-elevation salt marsh habitat, limited disturbance, minimal invasive species cover and slight variations in topography representing potential habitat for this species. This salt marsh likely represents a small portion of what was historically present. Common associated species included salt grass, marsh jaumea, annual pickleweed, arrow grass, Point Reyes bird's beak, and perennial pickleweed, among others.

Sea coast angelica (CRPR 4.2) is of limited distribution and is moderately threatened in California. It is a tap-rooted perennial herb in the Apiaceae family that grows up to 4.9 feet (1.5 m) in height. It is characterized by large, shiny-green, compound leaves and clusters of numerous, small, usually white, flowers arranged in compound umbels. The flowers typically bloom between April and September. Sea coast angelica is only found within coastal habitats in California, such as within coastal backdunes, on coastal bluffs and beaches, and along edges of coastal marshes and riparian areas. It is distinguished from similar species of angelica in the region by the presence of bractlets (such as, small bracts) below each small cluster of flowers and the lack of white hairs on the lower leaf surface, among other features.

Sea coast angelica is distributed along the northern California coastline, but is concentrated around the Humboldt Bay area. Its distribution stretches from Albion in Mendocino County to the Oregon border and into Alaska. Many local observations are recorded in Humboldt County, specifically around Humboldt Bay, and it can be locally abundant where conditions are right. This species is restricted to coastal areas and has a limited distribution, which makes it more susceptible to disturbance and habitat alteration. CNPS states that it is possibly threatened by invasive plants however other threats exist including foot traffic and trampling, and development or habitat.

Three occurrences of sea coast angelica were recorded within the study area in 2020 and 2022 (Note: Figures are included in SHN 2024b)).

- Occurrence 1 consisted of one individual in the far northern corner of the study area under the California State Route 255 bridge. This occurrence was located above the MHHW and was at the upper edge of salt marsh vegetation.
- Occurrence 2 consisted of one individual in the northern portion of the study area. This occurrence was located at the upper edge of salt marsh vegetation and above the MHHW and in an area that rarely experiences tidal inundation.
- Occurrence 3 consisted of four individuals within the northcentral portion of the study area along Humboldt Bay immediately north of the existing dock. The four individuals were located above the MHHW near the top of the embankment above the salt marsh vegetation and are above the reach of tidal inundation even during extreme events.

Site quality was good for the two northernmost occurrences due to the presence of high-quality high-elevation salt marsh habitat within the northern portion of the study area, although abundant non-native vegetation occurs at high densities just above the high salt marsh vegetation. Site quality

was fair for Occurrence 3, which exists in a narrow band of habitat between Humboldt Bay and invasive-dominated areas and impervious pavement from former industrial activity. Furthermore, portions of the embankment below Occurrence 3 are eroding, which could jeopardize the long-term viability of this occurrence. Common associated species included coast willow, Italian wildrye (*Festuca perennis*), California blackberry (*Rubus ursinus*), spring vetch (*Vicia sativa*), red fescue (*Festuca rubra* ssp. *pruinosa*), Pacific aster (*Symphyotrichum chilense*), and jubata grass (*Cortaderia jubata*), among others.

Although CRPR 4 plants do not meet the definition of "rare, threatened, or endangered" under CRPR definitions, they are considered of limited distribution in California. Specific CRPR 4 species may be considered of local concern or rare or unique to a region and therefore qualify as special-status species under CEQA (State CEQA guidelines Sections 15380(d) and 15125(c)). For example, they may be considered special-status if they are at the periphery of the species' range, at the type locality, are in areas where they are especially uncommon or declining, associated with unusual or declining habitats, occur on unusual substrates, or are maintained on sensitive species lists by other agencies. Seacoast angelica (CRPR 4) within the Project was evaluated using these criteria by reviewing distributional information available from herbarium records in the Consortium of California Herbaria (CCH) online specimen database, Calflora, and records from the region provided by the CNDDB (SHN 2024a). The sea coast angelica within the study area qualifies as special-status under CEQA based on the unusual and declining habitat in which it occurs. Salt marsh associated with Humboldt Bay has been significantly altered and reduced, and natural embankments above salt marsh have been hardened for large portions of bay lands, especially within the vicinity of the Project.

Additionally, one federal and state endangered species, one federal threatened and state endangered species, and one additional CRPR 1B species were observed immediately west of the Proposed Project area near New Navy Base Road and LP Drive. One occurrence of beach layia (*Layia carnosa*; Fed threatened and State endangered, CRPR 1B.1) was observed approximately 200 feet west of the Proposed Project area on public land, and multiple occurrences of Menzies' wallflower (Fed and State endangered, CRPR 1B.1) occur west of the Proposed Project area within 200 feet of the Proposed Project area (Note: Figures are included in SHN 2024b). Lastly, multiple occurrences of dark-eyed gilia (*Gilia millefoliata*; CRPR 1B.2) occur west of the Proposed Project area within 50 feet. These occurrences were not mapped because they are outside of the Proposed Project area (SHN 2024a).

Habitat of varying quality was present within the Proposed Project area for an additional 23 CRPR plant taxa on the scoping list (see Table J) that were not observed during protocol surveys. In general, habitats present for these CRPR taxa included coastal dunes, coastal salt marsh, coastal bluff scrub, coastal prairie, and disturbed areas (see discussion on natural communities above). Of the 23 CRPR species with potential habitat within the Proposed Project area, 7 were considered to have a low potential of occurrence and 16 were considered to have a moderate or high potential of occurrence within the Proposed Project area, based on habitat requirements or observations within the vicinity, but were not observed within the Proposed Project area (SHN 2024a).

Marine Vegetation

Eelgrass

The Humboldt Bay ecosystem hosts a number of other biologically sensitive habitats such as benthic habitat (including mudflats) and eelgrass beds. Nearshore and estuarine benthic habitats support a wide diversity of marine life by providing spawning, nursery, refuge, and foraging grounds for fish species. They play a critical role in the breakdown of organic matter through the actions of the scavengers, deposit-feeders and bacteria that occupy them. Benthic organisms are also important members of the lower food web, serving as food sources for higher-level consumers. Eelgrass is designated as Essential Fish Habitat (EFH) under the Magnuson-Stevens Fishery Conservation and Management Act (MSA) for federally- managed fish species within the Pacific Coast Groundfish and Pacific Coast Salmon Fisheries Management Plans, and also a Habitat Area of Particular Concern. Eelgrass beds are considered special aquatic sites under the 404(b; 1) guidelines of the CWA (40 CFR 230.43).

Table J. Special Status Plant Species List CNDDB, CNPS, IPaC: Eureka and Surrounding 7.5-minute quadrangles Humboldt Bay Off-shore Wind Heavy Lift Marine Terminal Biological Assessment 3/30/2022

Scientific Name	Common Name	Family	FedList	CalList	GRank	SRank	RPlant Rank	Bloom Period	General Habitat	Micro-Habitat	Potential of Occurrence
Abronia umbellata var. *breviflora*	pink sand-verbena	Nyctagin-aceae	None	None	G4G5-T2	S1	1B.1	June-Oct.	Coastal dunes and coastal strand.	Foredunes and interdunes with sparse cover. Usually the plant closest to the ocean. 0-10 m.	Moderate
Angelica lucida	Sea coast angelica	Apiaceae	None	None	G5	S3	4.2	May-Sept.	Coastal strand	Coastal bluff scrub, coastal dunes, coastal scrub, coastal salt marshes. 0-150 m	Present
Astragalus pycnostachyus var. *pycnostachyus*	coastal marsh milk-vetch	Fabaceae	None	None	G2T2	S2	1B.2	April-Oct.	Coastal dunes, marshes & swamps, coastal scrub.	Mesic sites in dunes or along streams or coastal salt marshes. 0-155 m.	High
Astragalus rattanii var. *rattanii*	Rattan's milk-vetch	Fabaceae	None	None	G4T4	S4	4.3	April-July	Chaparral, cismontane woodland, lower montane conifer forest.	Open grassy hillsides, gravelly flats in valleys, and gravel bars of stream beds. 30-825 m.	None
Cardamine angulata	seaside bittercress	Brassic-aceae	None	None	G5	S1	2B.1	Jan.-July	Lower montane, conifer forest, N. coast conifer forest, wetland	Wet areas, streambanks. 90-155 m.	None
Carex arcta	northern clustered sedge	Cyperaceae	None	None	G5	S1	2B.2	June-Sept.	Bogs and fens, north coast conifer forest.	Mesic sites. 60-1405 m.	None
Carex leptalea	bristle-stalked sedge	Cyperaceae	None	None	G5	S1	2B.2	March-July	Bogs and fens, meadows and seeps, marshes and swamps.	Mostly known from bogs and wet meadows. 3-1395 m.	None
Carex lyngbyei	Lyngbye's sedge	Cyperaceae	None	None	G5	S3	2B.2	April-August	Marsh & swamp (brackish or freshwater).	0-200 m.	High
Carex praticola	northern meadow sedge	Cyperaceae	None	None	G5	S2	2B.2	May-July	Meadows and seeps.	Moist to wet meadows. 15-3200 m.	None
Castilleja ambigua var. *humboldtiensis*	Humboldt Bay owl's-clover	Orobanch-aceae	None	None	G4T2	S2	1B.2	April-August	Marshes and swamps.	Coastal saltmarsh with *Spartina, Distichlis, Salicornia, Jaumea*. 0-20 m.	Present
Castilleja litoralis	Oregon coast paintbrush	Orobanch-aceae	None	None	G3	S3	2B.2	June	Coastal bluff scrub, coastal dunes, coastal scrub.	Sandy sites. 5-255 m.	Moderate
Chloropyron maritimum ssp. *palustre*	Point Reyes salty bird's-beak	Orobanch-aceae	None	None	G4?T2	S2	1B.2	June-Oct.	Coastal salt marsh.	Usually in coastal salt marsh with *Salicornia, Distichlis, Jaumea, Spartina,* etc. 0-10 m.	Present
Chrysosplenium glechomifolium	Pacific golden saxifrage	Saxifrag-aceae	None	None	G5	S3	4.3	Feb.-June	North Coast coniferous forest, riparian forest	Streambanks, sometimes seeps, sometimes roadsides. 10-220 m.	None
Collinsia corymbosa	round-headed Chinese-houses	Plantagin-aceae	None	None	G1	S1	1B.2	April-June	Coastal Dunes	Coastal dunes from 10-30 m	Low-One unconfirmed occurrence recorded in Humboldt Co.
Eleocharis parvula	small spikerush	Cyperaceae	None	None	G5	S4	4.3	July-August	Marsh & swamp, salt marsh, wetland	In coastal salt marshes. 1-3020 m.	High
Erysimum menziesii	Menzies' wallflower	Brassic-aceae	E	E	G1	S1	1B.1	March-Sept.	Coastal dunes.	Localized on dunes and coastal strand. 0-35 m.	High. Present immediately west.
Erythronium revolutum	coast fawn lily	Liliaceae	None	None	G4G5	S3	2B.2	March-August	Bogs & fens, broadleaf upland forest, north coast conifer forest.	Mesic sites; streambanks. 60-1405 m.	None

Scientific Name	Common Name	Family	FedList	CalList	GRank	SRank	RPlant Rank	Bloom Period	General Habitat	Micro-Habitat	Potential of Occurrence
Fissidens pauperculus	minute pocket moss	Fissident-aceae	None	None	G3?	S2	1B.2	Lichen	North coast coniferous forest, Redwood.	Moss growing on damp soil along the coast. In dry streambeds and on stream banks. 10-1024 m.	None
Gilia capitata ssp. *pacifica*	Pacific gilia	Polemoni-aceae	None	None	G5T3	S2	1B.2	April-August	Coastal bluff scrub, chaparral, coastal prairie, valley & foothill grassland.	5-1345 m.	Low
Gilia millefoliata	dark-eyed gilia	Polemoni-aceae	None	None	G2	S2	1B.2	April-July	Coastal dunes.	1-60 m.	High. Present immediately west.
Glehnia littoralis ssp. *leiocarpa*	American glehnia	Apiaceae	None	None	G5T5	S3	4.2	May-August	Coastal Dunes	0-20 m.	Moderate
Hesperevax sparsiflora var. *brevifolia*	short-leaved evax	Asteraceae	None	None	G4T3	S2	1B.2	March-June	Coastal bluff scrub, coastal dunes, coastal prairie.	Sandy bluffs and flats. 0-215 m.	High
Hosackia gracilis	harlequin lotus	Fabaceae	None	None	G4	S3	4.2	March-July	Broadleaf upland forest, coast bluff scrub, coast prairie, coast scrub, closed-cone conifer forest, meadow, seep, marsh & swamp, N. coast conifer forest, valley & foothill grassland.	Wetlands and roadsides. 0-700 m.	Low
Lasthenia californica ssp. *macrantha*	perennial goldfields	Asteraceae	None	None	G3T2	S2	1B.2	Jan.-Nov.	Coastal bluff scrub, coastal dunes, coastal scrub.	5-185 m.	Low
Lathyrus glandulosus	sticky pea	Fabaceae	None	None	G3	S3	4.3	April-June	Cismontane woodland.	In oak woodlands upland from the coast redwood forests & along roadsides. 300-800 m.	None
Lathyrus japonicus	seaside pea	Fabaceae	None	None	G5	S2	2B.1	May-August	Coastal dunes.	3-65 m.	Moderate
Lathyrus palustris	marsh pea	Fabaceae	None	None	G5	S2	2B.2	March-August	Bogs & fens, lower montane conifer forest, marsh & swamp, north coast conifer forest, coastal prairie, coastal scrub.	Moist coastal areas. 2-140 m.	High
Layia carnosa	beach layia	Asteraceae	E	E	G2	S2	1B.1	March-July	Coastal dunes, coastal scrub.	On sparsely vegetated, semi-stabilized dunes, usually behind foredunes. 0-30 m.	Moderate
Lilium kelloggii	Kellogg's lily	Liliaceae	None	None	G3	S3	4.3	May-August	Lower montane conifer forest, N. coast conifer forest.	Gaps and roadsides in conifer forest. 3-1300 m.	None
Lilium occidentale	western lily	Liliaceae	E	E	G1	S1	1B.1	June-July	Coastal scrub, freshwater marsh, bogs & fens, coastal bluff scrub, coast prairie, N. coast conifer forest, marshes and swamps.	Well-drained, old beach washes overlain with wind-blown alluvium and organic topsoil; usually near margins of Sitka spruce. 3-110 m.	None
Listera cordata	heart-leaved twayblade	Orchidaceae	None	None	G5	S4	4.2	Feb.-July	Lower montane conifer forest, north coast conifer forest.	Bogs and fens, 5-1370 m.	None
Lycopodium clavatum	running-pine	Lycopodi-aceae	None	None	G5	S3	4.1	June-Sept.	Lower montane conifer forest, north coast conifer forest, marsh &swamp.	Forest understory, edges, openings, roadsides; mesic sites with partial shade and light. 45-1225 m.	None
Mitellastra caulescens	leafy-stemmed mitrewort	Saxifrag-aceae	None	None	G5	S4	4.2	March-Oct.	Broadleaf upland forest, lower montane conifer forest, meadow & seep, N. coast conifer forest.	Mesic sites. 5-1700 m.	None

Scientific Name	Common Name	Family	FedList	CalList	GRank	SRank	RPlant Rank	Bloom Period	General Habitat	Micro-Habitat	Potential of Occurrence
Monotropa uniflora	ghost-pipe	Ericaceae	None	None	G5	S2	2B.2	June-Sept.	Broadleaved upland forest, north coast conifer forest.	Often under redwoods or west hemlock. 15-855 m.	None
Montia howellii	Howell's montia	Montiaceae	None	None	G3G4	S2	2B.2	Feb.-May	Meadows and seeps, north coast coniferous forest, vernal pools.	Vernally wet sites; often on compacted soil. 10-1005 m.	Moderate
Oenothera wolfii	Wolf's evening-primrose	Onagraceae	None	None	G2	S1	1B.1	May-Oct.	Coastal bluff scrub, coastal dunes, coastal prairie, low montane conifer forest.	Sandy substrates; usually mesic sites. 0-125 m.	High
Pityopus californicus	California pinefoot	Ericaceae	None	None	G4G5	S4	4.2	March-August	Broadleaf upland forest, upper montane and, N. coast conifer forest, low montane conifer forest.	Deep shade with few understory species, often under layer of duff, in rocky to clay loam soil. 15-2225 m.	None
Pleuropogon refractus	nodding semaphore grass	Poaceae	None	None	G4	S4	4.2	March-August	Meadow & seep, low montane conifer forest, N. coast conifer forest, riparian forest.	Mesic sites along streams, grassy flats in shaded redwood groves. 0-1600 m.	None
Puccinellia pumila	dwarf alkali grass	Poaceae	None	None	G4?	SH	2B.2	July	Marshes and swamps.	Mineral spring meadows and coastal salt marshes. 1-10 m.	Low
Ribes laxiflorum	trailing black currant	Grossulari-aceae	None	None	G5	S4	4.3	March-August	N. coast conifer forest, Redwood forests.	Grows over logs and stumps in moist, wet places. 5-1395 m.	None
Sidalcea malachroides	maple-leaved checkerbloom	Malvaceae	None	None	G3	S3	4.2	March-August	Broadleaf upland forest, coast prairie, coast scrub, N. coast conifer forest, riparian.	Woodlands and clearings near coast; often in disturbed areas. 0-730 m.	Low
Sidalcea malviflora ssp. *patula*	Siskiyou checkerbloom	Malvaceae	None	None	G5T2	S2	1B.2	May-August	Coastal bluff scrub, coastal prairie, north coast conifer forest.	Open coastal forest; roadcuts. 5-1255 m.	Low
Sidalcea oregana ssp. *eximia*	coast checkerbloom	Malvaceae	None	None	G5T1	S1	1B.2	June-August	Meadow & seep, N. coast & low montane conifer forest.	Near meadows, in gravelly soil. 5-1805 m.	None
Silene scouleri ssp. *scouleri*	Scouler's catchfly	Caryophyll-aceae	None	None	G5T4 T5	S2S3	2B.2	June-August	Coastal bluff scrub, coastal prairie, valley and foothill grassland.	5-315 m.	None
Spergularia canadensis var. *occidentalis*	western sand-spurrey	Caryophyll-aceae	None	None	G5T4	S1	2B.1	June-August	Marshes and swamps (coastal salt marshes).	0-3 m.	High
Sulcaria spiralifera	twisted horsehair lichen	Parmeliaceae	None	None	G3G4	S2	1B.2	Lichen	Coastal dunes, N. coast conifer forest (immediate coast)	Usually on conifers. 0-90 m.	Moderate
Trichodon cylindricus	cylindrical trichodon	Ditrichaceae	None	None	G4	S2	2B.2	Moss	Broadleafed upland forest, upper montane coniferous forest.	In openings on sandy or clay soils on roadsides, stream banks, trails or in fields. 50-1500 m.	None
Usnea longissima	Methuselah's beard lichen	Parmeli-aceae	None	None	G4	S4	4.2	Lichen	North coast coniferous forest, broadleaf upland forest.	In the "redwood zone" on tree branches of a variety of trees, incl. big leaf maple, oaks, ash, Douglas-fir, and bay. 45-1465 m in California.	None
Viola palustris	alpine marsh violet	Violaceae	None	None	G5	S1S2	2B.2	March-August4	Coastal scrub, bogs and fens.	Swampy, shrubby places in coastal scrub or coastal bogs. 0-150 m.	None

1. Species indicator status as assigned by Federal Endangered Species Act (FESA), California Endangered Species Act (CESA), and California Department of Fish and Wildlife (CDFW)

C: candidate
CT: candidate threatened
D: delisted
FP: fully protected
PT: proposed threatened
SSC: species of special concern

Scientific Name	Common Name	Family	FedList	CalList	GRank	SRank	RPlant Rank	Bloom Period	General Habitat	Micro-Habitat	Potential of Occurrence
DPS: distinct population segment			T: threatened								
E: endangered			WL: watch list								
ESU: evolutionarily significant unit											
2. Species Heritage rank as assigned by California Department of Fish and Wildlife (CDFW)											
G1/S1: critically imperiled											
G2/S2: imperiled											
G3/S3: vulnerable											
G4/S4: apparently secure											
G5/S5: secure											

Terrestrial Wildlife Species

Based on literature review, 32 special-status animal species have been reported with the potential to occur within the Proposed Project Area. Nine of these species were observed or detected during field surveys conducted by SHN in 2020 and 2022. Each species with potential to occur within the Proposed Project area is discussed below (SHN 2020; 2024a).

Amphibians

The **Northern Red-legged Frog** (*Rana aurora*) is reported from lowlands, foothills, humid forests, woodlands, grasslands, and within and adjacent to streamsides with plant cover. Breeding occurs in permanent water sources between December and April, with metamorphosis completed by late July. Typically, a pond frog, found in or near water, but northern red-legged frogs can be wide-ranging and highly terrestrial, sometimes inhabiting damp places far from water.

Status: Federal None, State None, Species of Special Concern, Global Rank Apparently Secure, State Rank Vulnerable.

Although this species was not detected, patches of suitable habitat exist within portions of the study area and in the surrounding vicinity for this species and has a low potential to occur on site. There are no RareFind occurrences of this species within or adjacent to the study area. No suitable habitat is identified throughout the majority of the site, with the northern undeveloped portion of the study area identified as moderate suitability by the CWHR system.

Birds

The **Cooper's hawk** (*Accipiter cooperii*) occupies woodlands, open and interrupted and marginal habitats. Nests are primarily in riparian areas with deciduous trees, in canyons bottoms, and also among live oaks. This species is often found in suburban areas, parks, and open fields and primarily hunt other birds and small mammals.

Status: Federal None, State None, Watch List, Global Rank Secure, State Rank Apparently Secure.

This species was **observed** foraging within the Proposed Project area on April 14, 2022 and suitable habitat exists for this species within the forested and forest edge portions of the Proposed Project area. There are no RareFind occurrences of this species within or adjacent to the Proposed Project area. The CDFW California Wildlife Habitats Relationships (CWHR) system identifies the majority of the site as high suitability habitat, with the northern undeveloped portion of the Proposed Project area identified as low suitability for this species. The Proposed Project area primarily provides foraging habitat, although areas of nesting habitat may be available, this species tends to prefer more dense wooded areas with taller trees for nesting.

The **sharp-shinned hawk** (*Accipiter striatus*) is found in pine, oak, and other mixed coniferous forests, riparian areas, and usually nesting within 275 feet of water. They require dense forest, ideally with a closed canopy, for breeding. They occupy a wide range of elevations, from sea level to near tree line. In the winter season, this species can be found at forest edges, in somewhat more open habitats than the dense forests they breed in, as well as in suburban areas with bird feeders.

Status: Federal None, State None, Watch List, Global Rank Secure, State Rank Apparently Secure.

Although this species was not detected, suitable foraging habitat exists within portions of the Proposed Project area for this species. There are no RareFind occurrences of this species within or adjacent the

Proposed Project area. The CWHR system identifies the majority of the site as high suitability habitat with the northern undeveloped portion of the Proposed Project area identified as low suitability for this species. However, typical suitable nesting habitat is not present within the Proposed Project area and is not expected to nest on site.

The **great egret** (*Ardea alba*) occupies brackish marsh, estuary, freshwater marsh, marsh and swamp, riparian forest, and wetland. This species is a colonial nester in large trees. Rookery sites are usually located near marshes, tide-flats, irrigated pastures, and margins of rivers and lakes.

Status: Federal None, State None, Global Rank Secure, State Rank Apparently Secure. This species is on the CDFW Special Animals List particular to rookeries.

Although this species was not detected during the 2022 site visits, it is expected to use this area occasionally, as foraging habitat is available in patches throughout the site and possible nesting habitat in the northern undeveloped portion. There are no RareFind occurrences of this species within or adjacent to the Proposed Project area, although, there is a known rookery on nearby Indian Island (Tuluwat) approximately 0.6 miles to the east where this species has historically been reported to nest. The entire site is identified as high suitability habitat for this species by CWHR. eBird reports an October 2020 occurrence of this species at the North Spit of the Humboldt Bay, an unspecified area of the Samoa Peninsula.

The **great blue heron** (*Ardea herodias*) can be found in brackish marsh, estuary, freshwater marsh, marsh and swamp, riparian forest, and wetland. Colonial nester in tall trees, cliffsides, and sequestered spots on marshes. Rookery sites are typically in close proximity to foraging areas such as marshes, lake margins, tide-flats, rivers and streams, and wet meadows.

Status: Federal None, State None, Global Rank Secure, State Rank Apparently Secure. This species is on the CDFW Special Animals List particular to rookeries.

This species was observed flying over the site on April 14, 2022, though was not considered “present”, but is expected to use the Proposed Project area occasionally, as foraging habitat is available in patches throughout the site and possible nesting habitat in the northern undeveloped portion. No RareFind occurrences are reported within or adjacent to the Proposed Project area, although, there is a known rookery site on nearby Indian Island (Tuluwat) approximately 0.6 miles to the east where this species has historically been reported to nest. The CWHR system identifies the majority of the site as high suitability habitat with portions of the northern undeveloped area identified as low suitability for this species. eBird reports an October 2019 occurrence of this species at the North Spit of the Humboldt Bay.

The **short-eared owl** (*Asio flammeus*) is found in swamp lands, both fresh and salt, lowland meadows, foothill grassland, wetland, and irrigated alfalfa fields. Tule patches/tall grass needed for nesting/daytime seclusion. Nests are made on dry ground in a depression, concealed in vegetation.

Status: Federal None, State None, Species of Special Concern, Global Rank Secure, State Rank Vulnerable.

This species was not detected during the 2022 site visits, though can often be observed during the day in the vicinity. There are no RareFind occurrences of this species within or adjacent to the Proposed Project area, although the entire site is identified as high suitability habitat for this species by CWHR. Foraging habitat exists within patches of the Proposed Project area, although nesting habitat is minimal and of low quality compared to the surrounding landscape.

The **American bittern** (*Botaurus lentiginosus*) occurs in freshwater and slightly brackish marshes as well as in coastal saltmarshes. Nests are made in dense reed beds or other tall vegetation. Wintering birds may also forage in dry grasslands and other terrestrial habitats.

Status: Federal None, State None, Global Rank Apparently Secure, State Rank Vulnerable/Apparently Secure.

This species was not detected during 2022 site visits and is not expected to occur on site for nesting. Suitable foraging habitat is patchy and of low quality compared to the surrounding landscape. There are no RareFind occurrences of this species within or adjacent to the Proposed Project area and there is no identified suitable habitat throughout the site by CWHR, aside from small, isolated areas of low suitability habitat along the shoreline.

The **Vaux's swift** (*Chaetura vauxi*) nests in coniferous or mixed forest, foraging in openings, especially above streams. They nest communally, usually in hollow trees. This species typically uses mature trees for nesting; however, nonbreeding birds also use tree hollows and chimneys during the summer, roosting communally.

Status: Federal None, State None, Species of Special Concern, Global Rank Secure, State Rank Imperiled/Vulnerable.

Although this species was not detected, suitable foraging habitat and potentially nesting and roosting habitat exists within the Proposed Project area for this species. There are no RareFind occurrences of this species within or adjacent to the Proposed Project area. The majority of the site is identified as moderate suitability habitat by CWHR with no identified suitable habitat in the northern undeveloped portion of the Proposed Project area.

The **Western snowy plover** (*Charadrius alexandrines nivosus*) occupies sandy beaches, river bars, salt pond levees, wetlands and shores of large alkali lakes. This species needs sandy, gravelly, or friable soils for nesting. They forage along river gravel bars and sandy beaches. The western snowy plover feeds on invertebrates in wet sand within the intertidal zone, in dry sand above high tide, on salt pans and spoil sites, and along the edges of salt marshes, salt ponds, and lagoons. The breeding season for the western snowy plover is from March through September, and they nest on sand spits, dune-backed beaches, beaches at creek and river mouths, and salt pans at lagoons and estuaries from southern Washington to Baja California. The nesting on the California coast is initiated as early as the first week of March and peaks from mid-April to mid-June. Snowy plovers are generally uncommon year-round in the Humboldt Bay region. Nesting has been observed on the North and South Spits of Humboldt Bay. Small numbers of plovers have been documented nesting on gravel bars of the Eel River and can be seen (rarely) attempting to nest on the Elk River Channel Nonbreeding western snowy plovers infrequently occur on the interior of Humboldt Bay (HT Harvey 2022).

Status: Federal Threatened, State None, Species of Special Concern, Global Rank Vulnerable, State Rank Imperiled/Vulnerable.

Although this species was not detected, patches of suitable foraging habitat exists for this species along the bay shore edges of the Proposed Project area. Suitable habitat of the Humboldt Bay area is documented as ocean beaches and gravel bars along the Eel River (SHN 2024a). The nearest RareFind occurrence of this species is noted as an unspecified area along the ocean beach of the North Spit of the Humboldt Bay (Samoa) with an occurrence date of 2014. eBird records show a November 2023 occurrence of this species at Humboldt Bay-North Jetty and an October 2019 occurrence at the North Spit of the Humboldt Bay.

Survey efforts have shown that western snowy plovers prefer to nest and make courtship scrapes in relatively flat, open, sparsely vegetated habitats, probably enabling early detection of predators, and preferentially select flatter and wider habitats with more debris and less vegetation (SHN 2024a).

During the non-breeding season, Brindock and Colwell (2011) found that snowy plovers occupied wide beaches that had more brown algae and associated invertebrates and less vegetation compared with unoccupied sites, suggesting that plovers selected habitats that provide more food and have lower risk of predation.

Existing development and narrow sandy shore above high tide line creates unsuitable nesting habitat for this species within the Proposed Project area. This species is sensitive to disturbance and is not expected to frequent the Proposed Project location. Habitat suitability modeling for this species is not available on the CWHR system. The closest Designated Critical Habitat for this species is mapped 4 miles to the southwest and 7.8 miles to the northeast of the Proposed Project area (SHN 2024a).

The **Northern harrier** (*Circus hudsonius*) is found in coastal salt and fresh-water marsh and riparian scrub, nesting and foraging in grasslands, from salt grass in desert sink to mountain cienagas. The nest is built of a large mound of sticks on the ground in shrubby vegetation, usually at the marsh edge. It occurs widely throughout California, and a common migrant and winter visitor in Humboldt County. Northern harriers are most commonly observed in the region from fall through the spring and can be seen foraging in open areas with marshes and intertidal zones. Historically, nests have been found on the North Spit (HT Harvey 2022).

Status: Federal None, State None, Species of Special Concern, Global Rank Secure, State Rank Vulnerable.

Although this species was not detected, suitable habitat exists within the vegetated portions of the Proposed Project area and surrounding. This species is known to regularly occur in the immediate vicinity year-round and has the potential to occur on site. There are no RareFind occurrences within or adjacent to the Proposed Project area, although there is a report of a historical nest approximately 1.7 miles to the southeast with an occurrence date from 2017. eBird reports an October 2019 occurrence of this species at the North Spit of the Humboldt Bay. The majority of the Proposed Project area is identified as medium suitability habitat with high suitability mapped in the northern undeveloped portion of the Proposed Project area.

The **snowy egret** (*Egretta thula*) is found in marsh and swamp, meadow and seep, riparian forest, riparian woodland, and wetlands. This species is a colonial nester, with nest sites situated in protected beds of dense tules. Rookery sites are typically situated close to foraging areas such as marshes, tidal-flats, streams, wet meadows, and borders of lakes in inland areas of the west.

Status: Federal None, State None, Global Rank Secure, State Rank Apparently Secure. Special-status for this species refers specifically to rookery sites.

Although this species was not detected, suitable foraging habitat exists within the riparian, wetlands, and shoreline portions of the Proposed Project area. No RareFind occurrences are reported within or adjacent to the Proposed Project area, although, there is a known rookery site on nearby Indian Island (Tuluwat), approximately 0.6 miles to the east where this species has historically been reported to nest. eBird reports an October 2019 occurrence of this species at the North Spit of the Humboldt Bay. The entire Proposed Project area is identified as low suitability habitat for this species by CWHR.

The **white-tailed kite** (*Elanus leucurus*) occurs in rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. Open grasslands, meadows, or marshes are used for foraging close to isolated, dense-topped trees for nesting and perching. This species is known to occur primarily in the agricultural fields and marshes in the area.

Status: Federal None, State None, Fully Protected, Global Rank Secure, State Rank Critically Imperiled/Imperiled.

Although this species was not detected, suitable habitat exists throughout portions of the Proposed Project area and adjacent. There are no RareFind occurrences of this species within or adjacent to the Proposed Project area. There are historical nest sites to the southeast approximately 2.6 miles away with the most recent occurrence date in 2015. There is a November 2023 eBird report of this species occurring at the North Spit of the Humboldt Bay. The majority of the Proposed Project area is identified as high suitability with the northern undeveloped portion of the Proposed Project area identified as low suitability habitat by CWHR. Foraging habitat exists in the short grass and marsh areas and potential nesting habitat does exist in the northern undeveloped portion of the Proposed Project area.

The **willow flycatcher** (*Empidonax traillii*) is a migrant and occasional breeder locally in meadow and seep, riparian scrub, riparian woodland, and wetland areas. This species inhabits extensive thickets of low, dense willows on edge of wet meadows, ponds, or backwaters from 2,000-8,000 feet (ft) elevation. They require dense willow thickets for nesting and roosting. Low, exposed branches are used for singing posts and hunting perches. The subspecies that occurs in northern California is the little willow flycatcher (*Empidonax traillii brewsterii*). The breeding range for *E.t. brewsterii* is generally considered to be the higher elevations of the Sierra Nevada ranges and into the northwestern USA (SHN 2024a). Nesting in Humboldt County appears to be a rare event; based on 5 years (1995-1999) of intensive breeding bird surveys conducted throughout Humboldt County, there were only one confirmed, two "probable", and four "possible" breeding occurrences reported (HT Harvey 2022).

Status: Federal None, State Endangered, Global Rank Secure, State Rank Critically Imperiled/Imperiled.

This species was not detected during reconnaissance surveys, and protocol-level surveys were not conducted. Suitable habitat exists in patches of the Proposed Project area, although it is of low quality and this species is considered rare along the northern California coast. Willow flycatcher is much more likely to occur as a migrant moving through the area, typically flying 125 meters above ground level (SHN 2024a). There are no RareFind occurrences of this species within or adjacent to the Proposed Project area and there is no identified suitable habitat within or adjacent to the Proposed Project area by CWHR.

The **merlin** (*Falco columbarius*) occurs within seacoast, tidal estuaries, open woodlands, savannahs, edges of grasslands and deserts, as well as farms and ranches. Clumps of trees or windbreaks are required for roosting in open country. Merlin tend to use abandoned nests of crows or hawks to lay their eggs.

Status: Federal None, State None, Watch List, Global Rank Secure, State Rank Vulnerable/Apparently Secure.

This species was **observed** foraging within the Proposed Project area on April 14, 2022. Suitable foraging habitat exists within and adjacent to the proposed Project area. There are no RareFind occurrences of this species within or adjacent to the Proposed Project area. The majority of the site is identified as medium suitability habitat with the northern undeveloped portion identified as low suitability habitat for this species. Merlin are known to breed in Alaska and Canada and are not expected to nest within the Proposed Project area.

The **American peregrine falcon** (*Falco peregrinus anatum*) is found in many open habitats, however, more likely along coastlines, lake edges, and mountain edges, and also near wetlands, lakes, rivers, or other water. This species nests on cliffs, banks, dunes, mounds, and human-made structures. This species is known to occur around the Humboldt Bay area. They generally prefer open landscapes for foraging, and during the non-breeding season between September and April, they may be found feeding on shorebirds and waterfowl in Humboldt Bay (HT Harvey 2022).

Status: Federal Delisted, State Delisted, Sensitive, Global Rank Apparently Secure, State Rank Vulnerable/Apparently Secure.

This species was **observed adjacent** to the Proposed Project area on April 14, 2022. Suitable foraging habitat exists within and adjacent to the Proposed Project area. The entire Proposed Project area is identified as high suitability habitat by CWHR, although suitable nesting habitat is scarce and of low-quality compared to the surrounding landscape. There are no RareFind occurrences with a specified location within the Proposed Project area. There is a historical nest adjacent to the site with a disclosed exact location with an occurrence date in 2020.

The **bald eagle** (*Haliaeetus leucocephalus*) occurs in lower montane conifer forest and old growth. They are found along ocean shores, lake margins, and rivers for both nesting and wintering. Most nests are within one mile of water. Nests are built in large, old growth, or dominant live tree with open branches, especially ponderosa pine. This species roosts communally in winter. They were historically uncommon in Humboldt County (Hunter et al. 2005); however, they have been seen feeding in marshes in Humboldt Bay and the lower Eel River delta (although uncommon) during the winter (Hunter et al. 2005) and are routinely found along the shores of Humboldt Bay (Harris 2006). Current nesting sites in Humboldt Bay are not well documented, but there may be nesting pairs in North Bay, and there is a breeding pair near Salmon Creek in South Bay (HT Harvey 2022).

Status: Federal Delisted, State Endangered, Fully Protected, Global Rank Secure, State Rank Vulnerable.

Although this species was not detected during site visits, suitable foraging habitat does exist adjacent to the Proposed Project area. No nesting habitat is available within or immediately adjacent to the Proposed Project area. There are no RareFind occurrences of this species within or adjacent to the Proposed Project area. The majority of the site has no identified suitable habitat by CWHR, with areas of low suitability in the northern undeveloped portion of the Proposed Project area.

The **long-billed curlew** (*Numenius americanus*) occupies Great Basin grassland meadow and seep. Breeds in upland shortgrass prairies and wet meadows in northeastern California. Habitats on gravelly soils and gently rolling terrain are favored over others. This species is known to forage along beaches and sandy shores on the Samoa peninsula and Humboldt Bay.

Status: Federal None, State None, Watch List, Global Rank Secure, State Rank Imperiled.

Although this species was not observed during site visits, suitable foraging habitat does exist adjacent to the Proposed Project area, within the mudflats along the shoreline of Humboldt Bay. There are no RareFind occurrences of this species within or adjacent to the Proposed Project area. The majority of the site has no identified suitable habitat by CWHR, with areas of medium to high suitability in the northern undeveloped portion of the Proposed Project area. However, no suitable nesting habitat is available within or immediately adjacent to the proposed Project area and this species is known to breed further inland.

The **black-crowned night heron** (*nycticorax*) occurs in marsh and swamp, riparian forest, riparian woodland, and wetlands. This species is a colonial nester, usually in trees, and occasionally in tule patches. Rookery sites located adjacent to foraging areas such as lake margins, mud-bordered bays, and marshes.

Status: Federal None, State None, Global Rank Secure, State Rank Apparently Secure. Special status refers specifically to rookery sites.

This species was **observed** during a previous biological assessment within a portion of the Proposed Project area (SHN 2020). Suitable roosting, rookery, and foraging habitat exists for this species within

portions of the Proposed Project area, particularly within the northern undeveloped portion. The majority of the site is identified as medium suitability habitat by CWHR. No RareFind occurrences are reported within the Proposed Project area, although, there is a known rookery site on nearby Indian Island (Tuluwat) approximately 0.6 miles to the east where this species has historically been reported to nest.

The **osprey** (*Pandion haliaetus*) occurs along ocean shores, riparian forest, bays, fresh-water lakes, and larger streams. This species builds large nests built in tree-tops or tall human-made structures, usually within 15 miles of a good fish-producing body of water. Ospreys are common (breeding) throughout the summer and rarer in the winter in Humboldt Bay. Most birds arrive as spring migrants in March, start nesting in late May, and depart in early October. Observations of this species is frequent around the Humboldt Bay area and several nests exist along the shores of the Samoa peninsula.

Status: Federal None, State None, Watch List, Global Rank Secure, State Rank Apparently Secure.

There are no specific RareFind occurrences within the Proposed Project area and the CWHR system identifies patches of low suitability along the shoreline in the Proposed Project area with no habitat suitability identified for a majority of the site. However, this species was **observed** with active nests throughout the Proposed Project area and is expected to continue to nest on site. eBird reports a May 2021 occurrence of this species at the North Spit of the Humboldt Bay.

Surveys for locating osprey nests and determining active or inactive status were conducted during the breeding season in 2022 within the Project footprint study area. All potential nesting platforms were inspected visually from the ground for the presence of nests. When a nest structure was located, it was monitored in April, June, and July 2022 to determine if it was currently being used, or if it showed signs of wear and not currently upkept. If osprey were currently using the nest, it was determined if the nest was "active", defined by behavior indicating a pair was either incubating, feeding nestlings, or supporting fledglings. All nest locations regardless of active or inactive status were noted and mapped (SHN 2024a).

Ten (10) osprey nest structures were observed within the study area during the April 13, 2022 site visit, all on human-made structures. Six (6) of these nests were active, with pairs apparently incubating eggs or young, with the male bringing food to the female on the nest (Note: Figures are included in SHN 2024b). During a site visit in June, all osprey young appeared to be fledged from nests, although nests were still being used for resting. By early July, osprey nests were not being frequented by osprey, and a few of the nests on the southern end of the study area were occupied by resting double-crested cormorants (SHN 2024a).

Osprey tend to remain with the same mate and return to the same nesting location year after year, and nesting is often semi-colonial, which may enhance foraging and reduce risk of predation. Osprey are expected to continue to return to existing nest sites within the study area during the breeding season (SHN 2024a).

The **Bryant's savannah sparrow** (*Passerculus sandwichensis alaudinus*) occurs in grasslands with few trees, cultivated fields, tidal salt marshes, and estuaries. This species nests on the ground, typically in a thick thatch of dead grasses or in low shrubs such as blackberry.

Status: Federal None, State None, Species of Special Concern, Global Rank Imperiled/Vulnerable, State Rank Imperiled/Vulnerable.

Although this species was not detected, suitable foraging and potential nesting habitat exists within the Proposed Project area for this species and it has the potential to occur on site. There are no RareFind occurrences of this species within or adjacent to the Proposed Project area. eBird reports an October

2019 occurrence of this species at the North Spit of the Humboldt Bay. The majority of the Proposed Project area has no identified suitable habitat by CWHR, with patches of medium suitability habitat in the northern undeveloped portion of the Proposed Project area.

The **California brown pelican** (*Pelecanus occidentalis californicus*) occur seasonally in estuaries and coastal marine habitat. They are a colonial nester on coastal islands of small to moderate size, which affords immunity from attack by ground-dwelling predators. In California, the breeding range of brown pelicans has been greatly reduced from the historic breeding range, and currently breeding is restricted to the Channel Islands in the US, and the majority of the northern Pacific population breeds in Mexico. Young birds and post-breeding dispersal represent the birds moving north as far as British Columbia. They feed in estuaries and nearshore ocean waters, plunge-diving to capture small schooling fishes near the water's surface. This species roosts communally and occurs along the Humboldt County coastline and Humboldt Bay primarily during migration and winter, with breeding areas further south.

Status: Federal Delisted, State Delisted, Global Rank Apparently Secure (Subspecies Vulnerable), State Rank Vulnerable.

This species was **observed** flying over the Proposed Project area during a previous Biological and Habitat Assessment in 2020 (SHN 2020) and is expected to roost and forage around the suitable habitat of Humboldt Bay. Roosting habitat exists along the edges of the Proposed Project area along the shoreline on piers and pilings. eBird reports this species in Humboldt County year-round, including a May 2021 occurrence at the North Spit of the Humboldt Bay. There are no RareFind occurrences of this species within or adjacent to the Proposed Project area and there is no habitat suitability mapped within or adjacent to the Proposed Project area by CWHR.

The **double-crested cormorant** (*Phalacrocorax auritus*) occur in riparian forest, riparian scrub, and riparian woodland. Double-crested cormorants are common year-round residents and breeders, favoring estuaries, and other bodies of water, and are most abundant during the winter. This species is a colonial nester on coastal cliffs, offshore islands, and along lake margins in the interior of the state, usually on the ground with sloping surface, or in tall trees along lake margins. This species is known to nest in various locations around Humboldt Bay. Currently, double-crested cormorants are routinely present in large roosts on piers in the Eureka Channel and near the Proposed Project area (HT Harvey 2022). Several hundred are regularly found feeding in deep channels throughout Humboldt Bay.

Status: Federal None, State None, Watch List, Global Rank Secure, State Rank Apparently Secure.

Suitable habitat exists within portions of the Proposed Project area for this species and was **observed** roosting and feeding young on July 11, 2022 at 'no name dock' and perching in old osprey nests on July 18, 2022. The majority of the Proposed Project area has no identified suitable habitat by CWHR, with patches of high suitability in the southern end of the Proposed Project area and along the shoreline. The adjacent waters of Humboldt Bay are identified as medium suitability habitat. Existing piers, docks, and platforms within the Proposed Project area are suitable habitat features for this species. There are no RareFind occurrences of this species within or adjacent to the Proposed Project area. eBird reports a May 2021 occurrence of this species at the North Spit of the Humboldt Bay.

The **black-capped chickadee** (*Poecile atricapillus*) inhabits riparian woodlands in Del Norte and northern Humboldt Counties in the southern extent of its year-round range. It is mainly found in deciduous trees, especially willows and alders, along large or small watercourses. The chickadee excavates its nest cavity in rotten wood, or nests in old woodpecker holes. This species is known to occur and nest in the coastal habitats around the Humboldt Bay area.

Status: Federal None, State None, Watch List, Global Rank Secure, State Rank Vulnerable.

Suitable foraging and nesting habitat exists for this species within portions of the Proposed Project area and it was **observed** on April 13, 2022. There are no RareFind occurrences of this species within or adjacent to the Proposed Project area and the CWHR system does not include the Humboldt Bay area in the habitat suitability model. eBird reports a November 2020 occurrence of this species at the North Spit of the Humboldt Bay.

Insects

The **obscure bumble bee** (*Bombus caliginosus*) historically has occurred in coastal areas from Santa Barbara County to Washington state. This species nests individually underground or above ground in abandoned bird nests, primarily in shrubland and grassland. Preferred food plant genera include *Baccharis, Cirsium, Lupinus, Lotus, Grindelia* and *Phacelia.* Dispersal occurs primarily in spring by queens while searching for suitable nest sites.

Status: Federal None, State None, Global Rank Apparently Secure, State Rank Critically Imperiled/ Imperiled.

Although this species was not identified during site visits, suitable habitat exists for this species within and adjacent to the Proposed Project area and has the potential to occur on site. Habitat suitability is not available for this species in the CWHR program. There are no RareFind occurrences of this species within or adjacent to the Proposed Project area. The closest occurrence is approximately 1.6 miles to the southeast with an occurrence date in 1962.

The **Western Bumblebee** (*Bombus occidentalis*) requires a variety of flowering resources spring, summer, and fall, and nests in colonies in the ground (abandoned ground squirrel or rodent burrows). Since 1998, this bumblebee has undergone a drastic decline throughout some areas of its former range. While viable populations still exist east of the Cascades, the once common populations of central California have largely disappeared. There have been significant range losses particularly from lower elevation sites in California (SHN 2024a).

Status: Federal None, State Candidate Endangered, Global Rank Imperiled/Vulnerable, State Rank Critically Imperiled.

Although this species was not identified during site visits, and may not occur in this coastal habitat, suitable habitat exists for this species within and adjacent to the Proposed Project area. Habitat suitability is not available for this species in the CWHR program. There is one RareFind occurrence with an unspecified area that includes a portion of the Proposed Project area with an occurrence date in 1993.

The **monarch butterfly** (*Danaus plexippus*) occurs from Canada to Mexico and may migrate through Humboldt County. They occupy fields, roadside areas, open areas, wet areas, or urban gardens. Milkweed and other flowering plants are used for food, but they only lay their eggs on milkweed plants.

Status: Federal Candidate, State None, Global Apparently Secure/Subspecies Critically Imperiled/ Imperiled, State Rank Imperiled.

This species was not detected during site visits and minimal overwintering habitat exists within the Proposed Project area. No milkweed is present for egg laying. This species is not expected to occur on site other than possibly moving through during migration. There are no RareFind occurrences of this species within or adjacent to the Proposed Project area. Habitat suitability is not available for this species in the CWHR program.

Mammals

The **Townsend's big-eared bat** (*Corynorhinus townsendii*) occurs throughout California in a wide variety of habitats including montane forest, riparian woodland, chaparral, and grasslands. This species is most common in mesic sites. They roost in the open, hanging from walls and ceilings. They are extremely sensitive to human disturbance. In the spring and summer, females form maternity colonies in mines, caves, or buildings (SHN 2024a).

Status: Federal None, State None, Species of Special Concern, Global Rank Vulnerable/Apparently Secure, State Rank Imperiled.

This species was not detected during acoustic survey sampling efforts in 2022. However, the buildings on site that are not currently occupied or in use may provide some roosting habitat for this species, although they are typically associated with desert scrub and pine forest habitats. The majority of the Proposed Project area is identified by CWHR as low suitability, with patches of medium suitability habitat in undeveloped areas. However, this species is highly sensitive to human disturbance, therefore maternity roosts are not expected on site. There are no RareFind occurrences of this species within or adjacent to the Proposed Project area.

The **Silver-haired bat** (*Lasionycteris noctivagans*) occupies coniferous and riparian forest. This species is primarily a coastal and montane forest dweller, feeding over streams, ponds, and open brushy areas. It roosts in hollow trees, beneath exfoliating bark, abandoned woodpecker holes, and rarely under rocks. They need access to drinking water. They form maternity colonies almost exclusively in tree cavities or small hollows and are dependent upon roosts in old-growth areas (SHN 2024a).

Status: Federal None, State None, Global Rank Vulnerable/Apparently Secure, State Rank Vulnerable/Apparently Secure.

This species was **detected** during acoustic survey sampling efforts on July 11 and July 18, 2022 (SHN 2024a). Suitable foraging and non-maternity roost habitat exists for this species throughout portions of the Proposed Project area. The majority of the Proposed Project area is identified by CWHR as medium suitability habitat with the northern undeveloped portion as low suitability for this species. There are no RareFind occurrences of this species within or adjacent to the Proposed Project area.

The **hoary bat** (*Lasiurus cinereus*) occurs in broadleaved upland forest, cismontane woodland, and lower montane and north coast conifer forests. This species prefers open habitats or habitat mosaics, access to trees for cover and open areas or habitat edges for feeding. It roosts solitarily in dense foliage of medium to large trees and feeds primarily on moths. This species requires water.

Status: Status: Federal None, State None, Global Rank Secure, State Rank Apparently Secure.

This species was **detected** during acoustic survey sampling efforts July 18, 2022 (SHN 2024a). Suitable habitat exists for this species throughout portions of the Proposed Project area, which is identified as low suitability by CWHR. There are no other RareFind occurrences of this species within or adjacent to the Proposed Project area.

The **long-eared myotis** (*Myotis evotis*) is found in all brush, woodland and forest habitats from sea level to about 9,000 ft but tends to prefer coniferous woodlands and forests. Nursery colonies can be found in buildings, crevices, spaces under bark, and snags. Caves are used primarily as night roosts.

Status: Federal None, State None, Global Rank Secure, State Rank Vulnerable.

Although this species was not detected during the acoustic sampling effort in 2022, suitable habitat exists for this species throughout portions of the Proposed Project area and has the potential to occur on site.

The CWHR does not identify suitable habitat throughout the majority of the Proposed Project area, with patchy medium suitability habitat in the northern undeveloped portion. There are no RareFind occurrences of this species within or adjacent to the Proposed Project area.

The **Yuma myotis** (*Myotis yumanensis*) occupies coniferous and riparian forests. Optimal habitats are open forests and woodlands, with sources of water over which to feed. Their distribution is closely tied to bodies of water. Maternity colonies can be found in caves, mines, buildings, or crevices.

Status: Federal None, State None, Global Rank Secure, State Rank Apparently Secure.

This species was **detected** during acoustic survey sampling efforts on July 11 and July 18, 2022 (SHN 2024a). Suitable habitat exists for this species throughout portions of the Proposed Project area. The CWHR identifies the majority of the Proposed Project area as low suitability habitat for this species. The northern portion of the Proposed Project area is identified as medium suitability habitat. There are no other RareFind occurrences of this species within or adjacent to the Proposed Project area.

Reptiles

The **western pond turtle** (*Emys marmorata*) is a thoroughly aquatic turtle of ponds, marshes, rivers, streams, and irrigation ditches, usually with aquatic vegetation, below 6,000 ft elevation. This species needs basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 kilometers (km) from water for egg-laying. Although this species spends most of its time in the water, terrestrial habitat is important for nesting, overwintering, and dispersal.

Status: Federal Proposed Threatened, State None, Global Rank Secure, State Rank Secure.

Although this species was not detected during 2022 site visits, suitable habitat may exist within the northern undeveloped portion of the Proposed Project area. The CWHR identifies the majority of the Proposed Project area as low suitability habitat for this species. The northern portion of the Proposed Project area is identified as medium suitability habitat. There are no RareFind occurrences of this species within or adjacent to the Proposed Project area. The nearest occurrence is over 3 miles to the southeast with an occurrence date of 2013.

Shorebirds

To better capture an understanding of shorebird habitat use (of the mudflats) and behavior in the Proposed Project area, bimonthly surveys were conducted during the fall migration period between July 25, 2023 and October 26, 2023. Transects targeted the coastal mudflats and started at the intersection between the marine development and habitat restoration subarea, extending south along the entire shoreline until the boundary of the Proposed Project area. There were a total of ten surveys conducted in the Proposed Project area, including the initial site visits, counting 4,101 individual birds spanning 75 different species. (HT Harvey 2023).

There were certain species routinely observed in numbers in the Proposed Project area. These include marbled godwits, and least and western sandpipers (primarily during the August surveys when they migrate) foraging in the mudflats. On certain occasions, these species were observed in the hundreds. Green-winged teals were also commonly observed foraging in the mudflats. Western gulls, Brandt's cormorants, and double-crested cormorants were routinely observed loafing on the piles and structures. Given the existing understanding of bird use of Humboldt Bay, these observations align with what is expected for surveys at low tide during this time of year. These surveys represent a small snapshot in time and were not continuous nor extensive. They were only designed to provide some initial data that can be expanded on in the future and used to support additional studies (HT Harvey 2023).

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Table K. Special Status Terrestrial Animal Species List CNDDB, IPaC: Eureka and Surrounding 7.5-minute quadrangles Humboldt Bay Off-shore Wind Heavy Lift Marine Terminal Terrestrial Biological Report 2023

Scientific Name	Common Name	FedList	CalList	GRank	SRank	GenHab	MicroHab	Potential of Occurrence
Amphibians								
Ascaphus truei	Pacific tailed frog	None	None, SSC	G4	S3S4	Aquatic. Flowing waters. Occurs in montane hardwood-conifer, redwood, Douglas-fir & ponderosa pine habitats.	Restricted to perennial montane streams. Tadpoles require water below 15 degrees C.	None, no suitable habitat available on site or adjacent.
Rana aurora	northern red-legged frog	None	None, SSC	G4	S3	Flowing waters and ponds. Humid forests, woodlands, grasslands, & streamsides in NW California, usually near dense riparian cover.	Generally near permanent water, but can be found far from water, in damp woods and meadows, during non-breeding season.	Low, no suitable breeding habitat available, dispersal habitat sparse and fragmented.
Rana boylii pop. 1	foothill yellow-legged frog	E (excluding North Coast Clade)	None, SSC	G3	S3	Partly-shaded, shallow streams & riffles with a rocky substrate in a variety of habitats. Lower montane conifer forest, meadow & seep, riparian forest and woodland.	Need at least some cobble-sized substrate for egg-laying. Need at least 15 weeks to attain metamorphosis.	None, no suitable available on site or adjacent.
Rhyacotriton variegatus	southern torrent salamander	None	None, SSC	G3G4	S2S3	Coastal redwood, Douglas-fir, mixed conifer, montane riparian, and montane hardwood-conifer habitats. Old growth forest.	Cold, well-shaded, permanent streams and seepages, or within splash zone or on moss-covered rock within trickling water.	None, no suitable available on site or adjacent.
Birds								
Accipiter cooperii	Cooper's hawk	None	None, WL	G5	S4	Woodland, chiefly of open, interrupted or marginal type. Riparian forests.	Nest sites mainly in riparian growths of deciduous trees, as in canyon bottoms on river flood-plains; also, live oaks.	High, suitable foraging habitat on site. Present 2022.
Accipiter striatus	sharp-shinned hawk	None	None, WL	G5	S4	Ponderosa pine, black oak, riparian deciduous, mixed conifer & Jeffrey pine habitats. Prefers riparian areas.	North-facing slopes, with plucking perches are critical requirements. Nests usually within 275 ft of water.	Low, minimal suitable foraging habitat available.
Ardea alba	great egret	None	None, S	G5	S4	Brackish marsh, estuary, freshwater marsh, marsh & swamp, riparian forest, wetland. Colonial nester in large trees.	Rookery sites located near marshes, tide-flats, irrigated pastures, and margins of rivers and lakes.	High, foraging habitat available throughout the site, possible nesting habitat in north portion.
Ardea herodias	great blue heron	None	None, S	G5	S4	Brackish marsh, estuary, freshwater marsh, marsh & swamp, riparian forest, wetland. Colonial nester in tall trees, cliffsides, and sequestered spots on marshes.	Rookery sites in close proximity to foraging areas: marshes, lake margins, tide-flats, rivers and streams, wet meadows.	High, foraging habitat available throughout the site, possible nesting habitat in north portion.
Asio flammeus	short-eared owl	None	None, SSC	G5	S3	Found in swamp lands, both fresh and salt; lowland meadows; foothill grassland, wetland, irrigated alfalfa fields.	Tule patches/tall grass needed for nesting/daytime seclusion. Nests on dry ground in depression concealed in vegetation.	Low, minimal suitable habitat available on site or adjacent.
Botaurus lentiginosus	American bittern	None	None	G4	S3S4	Freshwater and slightly brackish marshes. Also in coastal saltmarshes.	Dense reed beds.	Low, very little suitable habitat available on site.
Brachyramphus marmoratus	marbled murrelet	T	E	G3G4	S1	Lower montane conifer forest, Oldgrowth Redwood Feeds near-shore; nests inland along coast from Eureka to Oregon border.	Nests in old-growth redwood-dominated forests, up to 6 mi. inland, often in Douglas-fir. Uses open ocean, uncommon in Humboldt Bay.	None, no suitable habitat on site (terrestrial area).
Chaetura vauxi	Vaux's swift	None	None, SSC	G5	S2S3	Redwood, Douglas-fir, & other coniferous forests. Old growth. Nests in large hollow trees & snags. Often nests in flocks.	Forages over most terrains and habitats but shows a preference for foraging over rivers and lakes.	Low, minimal foraging habitat available, no suitable nesting habitat.
Charadrius alexandrinus nivosus	western snowy plover	T	None, SSC	G3T3	S2S3	Sandy beaches, river bars, salt pond levees, wetlands & shores of large alkali lakes.	Needs sandy, gravelly or friable soils for nesting. Forages along river gravel bars and sandy beaches.	Low, no suitable nesting habitat available, minimal foraging habitat.
Charadrius montanus	mountain plover	None	None, SSC	G3	S2S3	Chenopod scrub. Valley and foothill short grasslands, freshly plowed fields, newly sprouting grain fields, & sometimes sod farms.	Short vegetation, bare ground & flat topography. Prefers grazed areas & areas with burrowing rodents.	None, no suitable habitat available, out of typical range.

Scientific Name	Common Name	FedList	CalList	GRank	SRank	GenHab	MicroHab	Potential of Occurrence
Circus hudsonius	northern harrier	None	None, SSC	G5	S3	Coastal salt & fresh-water marsh, riparian scrub. Nest & forage in grasslands, from salt grass in desert sink to mountain cienagas.	Nests on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas.	Moderate, limited suitable foraging habitat available.
Coccyzus americanus occidentalis	western yellow-billed cuckoo	T	E	G5T2T3	S1	Riparian forest nester, along the broad, lower flood-bottoms of larger river systems.	Nests in riparian jungles of willow, often mixed with cottonwoods, w/ lower story of blackberry, nettles, or wild grape.	None, no suitable habitat available, out of typical range.
Contopus cooperi	olive-sided fly catcher	None	None, SSC	G4	S4	Nesting habitats are mixed conifer, montane hardwood conifer, Douglas-fir, redwood, red fir & lodgepole pine.	Most numerous in montane conifer forests where tall trees overlook canyons, meadows, lakes or other open terrain.	None, no suitable habitat available.
Coturnicops noveboracensis	yellow rail	None	None, SSC	G4	S1S2	Freshwater marsh Meadow & seep. Summer resident in eastern Sierra Nevada in Mono County.	Freshwater marshlands.	None, no suitable habitat available, out of typical range.
Egretta thula	snowy egret	None	None	G5	S4	Marsh & swamp, meadow & seep, riparian forest, riparian woodland, wetland. Colonial nester, with nest sites situated in protected beds of dense tules.	Rookery sites situated close to foraging areas: marshes, tidal-flats, streams, wet meadows, and borders of lakes.	Moderate, minimal suitable habitat available.
Elanus leucurus	white-tailed kite	None	None, FP	G5	S3S4	Rolling foothills and valley margins w/scattered oaks & river bottomlands or marshes next to deciduous woodland.	Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.	Moderate, minimal suitable habitat available.
Empidonax traillii	willow flycatcher	None	E	G5	S1S2	Meadow & seep, riparian scrub, riparian woodland, wetland. Inhabits extensive thickets of low, dense willows on edge of wet meadows, ponds, or backwaters; 2000-8000 ft elevation.	Requires dense willow thickets for nesting/roosting. Low, exposed branches are used for singing posts/hunting perches.	Low, minimal suitable habitat, not typical ecological setting.
Falco columbarius	merlin	None	None, WL	G5	S3S4	Seacoast, tidal estuaries, open woodlands, savannahs, edges of grasslands & deserts, farms & ranches.	Clumps of trees or windbreaks are required for roosting in open country. Use abandoned nests of crows and hawks.	High, suitable foraging habitat available. Present 2022.
Falco peregrinus anatum	American peregrine falcon	D	D, S	G4T4	S3S4	Many open habitats, however, more likely along coastlines, lake edges, mountain edges. Near wetlands, lakes, rivers, or other water; nests on cliffs, banks, dunes, mounds; also, human-made structures.	Nest consists of a scrape or a depression or ledge in an open site.	High, suitable foraging habitat. (Present adjacent 2022).
Haliaeetus leucocephalus	bald eagle	D	E, FP	G5	S3	Lower montane conifer forest, Old growth. Ocean shore, lake margins, & rivers for both nesting & wintering. Most nests within 1 mi of water.	Nests in large, old-growth, or dominant live tree w/open branches, especially ponderosa pine. Roosts communally in winter.	Low, suitable foraging habitat adjacent, no nesting habitat on site.
Numenius americanus	long-billed curlew	None	None, WL	G5	S2	Great Basin grassland Meadow & seep. Breeds in upland shortgrass prairies & wet meadows in northeastern California.	Habitats on gravelly soils and gently rolling terrain are favored over others.	Low, suitable foraging habitat along shoreline, no nesting habitat on site.
Nycticorax nycticorax	black-crowned night heron	None	None	G5	S4	Marsh & swamp, riparian forest, riparian woodland, wetland. Colonial nester, usually in trees, occasionally in tule patches.	Rookery sites located adjacent to foraging areas: lake margins, mud-bordered bays, marshes.	High, suitable habitat on site in northern portion. Present 2020.
Pandion haliaetus	osprey	None	None, WL	G5	S4	Ocean shore, riparian forest, bays, fresh-water lakes, and larger streams.	Large nests built in tree-tops or tall human-made structures within 15 miles of a good fish-producing body of water.	High, suitable habitat on site. Present. On-going historical nesting on site. 6 active nests in 2022.
Passerculus sandwichensis alaudinus	Bryant's savannah sparrow	None	None, SSC	G5T2T3	S2S3	Agricultural fields, wet meadows, brackish marsh, low growing grasslands, low tidally influenced habitat and adjacent ruderal areas.	Moist grasslands within and just above the fog belt.	Moderate, suitable habitat available in portions of the site.

Scientific Name	Common Name	FedList	CalList	GRank	SRank	GenHab	MicroHab	Potential of Occurrence
Pelecanus occidentalis californicus	California brown pelican	D	D	G4T3	S3	Estuaries and coastal marine habitat. Colonial nester on coastal islands just outside the surf line.	Nests on coastal islands of small to moderate size which afford immunity from attack by ground-dwelling predators. Roosts communally.	Low, suitable foraging habitat adjacent, no nesting habitat on site. Fly-over (2020).
Phalacrocorax auritus	double-crested cormorant	None	None, WL	G5	S4	Riparian forest, Riparian scrub, Riparian woodland. Colonial nester on coastal cliffs, offshore islands, & along lake margins in the interior of the state.	Nests along coast on sequestered islets, usually on ground with sloping surface, or in tall trees along lake margins.	High, foraging habitat adjacent and roosting habitat on site, limited nesting habitat on site. Present (2020 and 2022).
Poecile atricapillus	black-capped chickadee	None	None, WL	G5	S3	Inhabits riparian woodlands in Del Norte and northern Humboldt counties.	Mainly found in deciduous tree-types, especially willows and alders, along large or small watercourses.	High, suitable nesting and foraging habitat on site. Present 2022.
Riparia riparia	bank swallow	None	T	G5	S2	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert.	Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole.	None, no suitable habitat on site or adjacent.
Strix occidentalis caurina	northern spotted owl	T	T	G3T3	S2S3	Old-growth forests or mixed stands of old-growth & mature trees. Occasional in younger forests w/ patches of big trees.	High, multistory canopy dominated by big trees, many trees w/cavities or broken tops, woody debris & space under canopy.	None, no suitable habitat on site or adjacent.
Insects								
Bombus caliginosus	obscure bumble bee	None	None	G4?	S1S2	Coastal areas from Santa Barbara county to north to Washington state.	Nests underground or above ground in abandoned bird nests. Food plant genera include Baccharis, Cirsium, Lupinus, Lotus, Grindelia and Phacelia.	Low, minimal nesting and foraging habitat.
Bombus occidentalis	western bumble bee	None	CE	G2G3	S1	Once common & widespread, species has declined precipitously from central CA to southern B.C., perhaps from disease.	Nest in cavities or abandoned burrows.	Low, minimal nesting and foraging habitat. Uncommon on the coast now.
Bombus crotchii	Crotch bumble bee	None	CE	G3G4	S1S2	California, parts of Nevada. Warm, dry environments such as desert scrub.	Nests are often located underground in abandoned rodent nests.	None, not typical habitat and out of current known range.
Cicindela hirticollis gravida	sandy beach tiger beetle	None	None	G5T2	S2	Coastal dunes. Inhabits areas adjacent to non-brackish water along the coast of California from San Francisco Bay to northern Mexico.	Clean, dry, light-colored sand in the upper zone. Subterranean larvae prefer moist sand not affected by wave action.	None, no suitable habitat available on site.
Danaus plexippus plexippus pop. 1	monarch butterfly – California overwintering population	Candidate	None	G4T1T2Q	S2	Canada to Mexico. Fields, roadside areas, open areas, wet areas or urban garden.	Milkweed and other flowering plants. They only lay eggs on milkweed.	Low, minimal resting or foraging habitat, no milkweed present.
Scaphinotus behrensi	Behrens' snail-eating beetle	None	None	G2G4	S2S4	Coniferous forest Found in extreme NW CA along the coast.	Shaded, moist ground, occasionally tree trunks. Nocturnal, takes cover under fallen trees and leaf litter.	None, no suitable habitat available.
Mammals								
Aplodontia rufa humboldtiana	Humboldt mountain beaver	None	None	G5TNR	SNR	Coastal scrub, redwood forest, riparian forest. Coast Range in southwestern Del Norte County and northwestern Humboldt County.	Variety of coastal habitats, including coastal scrub, riparian forests, typically with open canopy and thickly vegetated understory.	None, no suitable habitat available.
Arborimus albipes	white footed vole	None	None, SSC	G3G4	S2	Mature coastal forests in Humboldt & Del Norte cos. Prefers areas near small, clear streams with dense alder & shrubs.	Occupies the habitat from the ground surface to the canopy. Feeds in all layers & nests on the ground under logs or rock	None, no suitable habitat available.
Arborimus pomo	Sonoma tree vole	None	None, SSC	G3	S3	N. coast fog belt from Oregon border to Sonoma Co. In Douglas-fir, redwood & montane hardwood-conifer forests. Old growth.	Feeds almost exclusively on Douglas-fir needles. Will occasionally take needles of grand fir, hemlock or spruce.	None, no suitable habitat available.
Corynorhinus townsendii	Townsend's big-eared bat	None	None, SSC	G3G4	S2	Throughout California in a wide variety of habitats including montane forest, riparian woodland, chaparral, and grasslands. Most common in mesic sites.	Roosts in the open, hanging from walls & ceilings. Extremely sensitive to human disturbance.	Low, abandoned buildings may provide habitat, though human disturbance is near and on-going.

Scientific Name	Common Name	FedList	CalList	GRank	SRank	GenHab	MicroHab	Potential of Occurrence
Erethizon dorsatum	North American porcupine	None	None	G5	S3	Forested habitats in the Sierra Nevada, Cascade, and Coast ranges.	Wide variety of coniferous and mixed woodland habitat.	None, no suitable habitat available.
Lasionycteris noctivagans	Silver-haired bat	None	None	G3G4	S3S4	Coniferous and riparian forest. Primarily a coastal and montane forest dweller, feeding over streams, ponds and open brushy areas.	Roosts in hollow trees, beneath exfoliating bark, abandoned woodpecker holes, and rarely under rocks. Needs drinking water.	Moderate, suitable habitat available. Present during July 2022 acoustic survey sampling.
Lasiurus cinereus	hoary bat	None	None	G5	S4	Broadleaved upland forest, cismontane woodland, lower montane and North coast conifer forests. Upland Prefers open habitats or habitat mosaics, access to trees for cover and open areas or habitat edges for feeding.	Roosts in dense foliage of medium to large trees. Feeds primarily on moths. Requires water.	Moderate, suitable habitat available. Present during July 2022 acoustic survey sampling.
Martes caurina humboldtensis	Humboldt marten	T	E, SSC	G5T1	S1	North coast conifer forest, old growth, Redwood forest. Occurs only in the coastal redwood zone from the Oregon border south to Sonoma County.	Associated with late-successional coniferous forests, prefer forests with low, overhead cover.	None, no suitable habitat available.
Myotis evotis	long-eared myotis	None	None	G5	S3	Found in all brush, woodland & forest habitats from sea level to about 9000 ft. prefers coniferous woodlands & forests.	Nursery colonies in buildings, crevices, spaces under bark, & snags. Caves used primarily as night roosts.	Low, minimal suitable habitat available.
Myotis yumanensis	Yuma myotis	None	None	G5	S4	Coniferous and riparian forests. Optimal habitats are open forests and woodlands with sources of water over which to feed.	Distribution is closely tied to bodies of water. Maternity colonies in caves, mines, buildings or crevices.	High, suitable habitat available. Present during July acoustic survey sampling.
Pekania pennanti	fisher (west coast DPS)	None	None, SSC	G5T2-T3Q	S2S3	Intermediate to large-tree stages of conifer forests & deciduous-riparian areas with high percent canopy closure.	Uses cavities, snags, logs & rocky areas for cover & denning. Needs large areas of mature, dense forest. West Coast DPS refers to West Coast population excluding Southern Sierra Nevada DPS.	None, no suitable habitat available.
Reptiles								
Emys marmorata	western pond turtle	None	None, SSC	G3G4	S3	A thoroughly aquatic turtle of ponds, marshes, rivers, streams & irrigation ditches, usually with aquatic vegetation, below 6,000 ft elevation.	Need basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.	Low, minimal suitable habitat available.

1. Species indicator status as assigned by Federal Endangered Species Act (FESA), California Endangered Species Act (CESA), and California Department of Fish and Wildlife (CDFW)

C: candidate
CT: candidate threatened
D: delisted
DPS: distinct population segment
E: endangered
ESU: evolutionarily significant unit
FP: fully protected
PT: proposed threatened
SSC: species of special concern
T: threatened
WL: watch list

2. Species Heritage rank as assigned by California Department of Fish and Wildlife (CDFW)

G1/S1: critically imperiled
G2/S2: imperiled
G3/S3: vulnerable
G4/S4: apparently secure
G5/S5: secure

Marine Wildlife Species

A list of marine wildlife species, including seabirds and other water-dependent birds that have a potential to occur within the Proposed Project area and within 5 miles were compiled (see Table L). These species are discussed below (HT Harvey 2022).

Seabirds and Other Water Birds

Marbled murrelet (Brachyramphus marmoratus)

The marbled murrelet is a sea bird that occurs along the Pacific coast from Alaska to California, foraging nearshore in marine subtidal and pelagic habitats for small fish and invertebrates. In California, nesting primarily occurs in Del Norte and Humboldt counties, but this species breeds as far south as Santa Cruz County. Marbled murrelets breed in redwoods greater than 200 years old. In Humboldt, they are almost exclusively found in coastal redwoods. Historically, marbled murrelets occurred in small numbers near the entrance to Humboldt Bay as foragers, particularly in the late summer and fall. They were similarly observed in the subtidal entrance portion of the bay between King Salmon and the entrance to the bay. Recently, sightings are minimal, and especially limited near the Proposed Project area, although foraging habitat exists for this species within the wetted channel of the Proposed Project area (HT Harvey 2022).

Black brant (Branta bernicla)

The black brant is a sea goose that relies on Pacific coastal habitats and is considered a California State Species of Special Concern while wintering/staging. They do not breed in the region. Rather, Humboldt Bay (especially eelgrass beds in the South Bay) is an important wintering area and spring staging site during their northward spring migration, between January through April. In a given year, Humboldt Bay supports a substantial proportion of the black brant population during migration. Based on peak use, Humboldt Bay is the most important spring staging site in California. During a two-year study, Humboldt Bay was estimated to support 28 percent of the flyway population (37,600 birds) in 2000 and 58 percent (77,800 birds) in 2001, indicating that a substantial proportion of the population relies on Humboldt Bay. The mean stopover duration for all birds in winter and spring (January – April) was estimated to be 26 days (HT Harvey 2022).

Black brant were historically present in fewer numbers in North Humboldt Bay. Surveys conducted in Humboldt Bay each February between 1976 and 2000 found that approximately 80 percent of the birds were observed in South Bay during that period. Black brant feed almost exclusively on eelgrass (HT Harvey 2022). With eelgrass increasing in North Bay in recent years, black brant numbers have similarly increased, mostly north of the Samoa Bridge (HT Harvey 2022). Black brant have a high likelihood of being present within Humboldt Bay between January and April while they winter and stage, including within the wetted channel of the Proposed Project area.

Fish

Humboldt Bay supports four salmonid species that are listed as threatened under the federal ESA: coho salmon (*Oncorhynchus kisutch*) Southern Oregon-Northern Coastal California (SONCC) ESU (also listed as threatened under CESA), Northern California steelhead (*Oncorhynchus mykiss irideus*) DPS, and California coastal Chinook salmon (*Oncorhynchus tshawytscha*) ESU. Humboldt Bay additionally supports coastal cutthroat trout (*Oncorynchus clarkii clarkii*), a CDFW species of special concern (HT Harvey 2022).

Salmonid life history is characterized by periods of adult upstream migration, spawning and egg development, fry and juvenile development, juvenile downstream migration, stream-estuary ecotone

rearing, and oceanic foraging and growth to adulthood. This complex life history yields differential use of habitat over time. Salmonids can occur in Humboldt Bay as adults migrating from the ocean through Humboldt Bay to natal tributaries to spawn, and as smolts heading to sea to feed and grow.

Southern Oregon/Northern California Coast Coho Salmon

Coho salmon are a widespread Pacific salmonid occupying most river basins in Northern California. The SONCC ESU includes naturally spawned coho salmon originating between Cape Blanco, Oregon, and Punta Gorda, California, thus encompassing Humboldt Bay. The SONCC ESU is state and federally threatened and listed as a CDFW Species of Special Concern. Humboldt Bay and its tributaries are considered critical habitat for this population (HT Harvey 2022).

Coho salmon typically exhibit a 3-year life history, split between freshwater and saltwater phases. Coho salmon smolts are typically found in Humboldt Bay April through July. There are two basic life history strategies for juvenile coho salmon in Humboldt Bay tributaries. The first strategy includes those that rear in the upper estuary (near salt marsh habitat) for the summer and migrate back upstream to over-winter, and the second strategy include those that rear in the lower estuary (for example, intertidal habitat of Humboldt Bay) and then migrate to the ocean. Juvenile coho salmon leaving freshwater and estuarine habitats occur in Humboldt Bay for 15-22 days prior to entering the Pacific Ocean. Within Humboldt Bay, they primarily use central, deep channels and channel margins of Humboldt Bay, and can be found near eelgrass beds (but not over them; HT Harvey 2022). Juveniles outmigrate through Humboldt Bay from March through June to feed throughout the north Pacific, then reenter as adults between October and January to spawn in their natal tributaries. Those migrating are only present in Humboldt Bay for a short time period. Coho salmon are likely to be present (and susceptible to changes) within the wetted channel of the Proposed Project area when adults are returning to spawn and when smolts are outmigrating to the Pacific Ocean (HT Harvey 2022).

California Coastal Chinook Salmon

The California Coastal ESU includes 15 independent populations of fall-run and six independent populations of spring-run Chinook salmon. This ESU encompasses all Chinook salmon that naturally spawned from Redwood Creek in Humboldt County through the Russian River. This ESU has been listed as federally threatened since 1999 and recently updated in 2014. Critical habitat was designated in 2005 and includes Humboldt County, and river reaches from Redwood Creek in Humboldt County to the Russian River in Sonoma County.

California Coastal Chinook salmon are known to spawn and rear in the Eel and Mad Rivers and in tributaries of Humboldt Bay such as Freshwater Creek, Elk River, and Salmon Creek. Chinook salmon migrate through Humboldt Bay as adults returning to spawn in tributaries and as juveniles migrating to the Pacific Ocean. Adults migrate to freshwater tributaries to spawn in the fall and juveniles migrate through during their seaward migration in the spring and summer. Juveniles and adults are likely to be present within the wetted channel of the Proposed Project area for select brief periods during their migration between freshwater and ocean habitats (HT Harvey 2022).

Northern California Steelhead Distinct Population

The Northern California steelhead DPS includes the steelhead naturally spawned between Redwood Creek, Humboldt County and the Gualala River, Sonoma County. This DPS has been federally threatened since 2000 and contains winter and summer populations. Critical habitat was designated in 2005 and consists of river reaches from Redwood Creek to Point Arena on the Mendocino coast. Humboldt Bay and its tributaries are included in its critical habitat. Northern California steelhead are known to rear in tributaries of Humboldt Bay and migrate through the bay itself on their seaward migration as juveniles. After reaching the ocean in the spring, juvenile steelhead tend to move offshore quickly rather than use nearshore waters like other salmon. Adults also migrate through Humboldt Bay to reach their tributaries to spawn in winter and early spring. Migratory individuals are likely to occur within the wetted channel of the Proposed Project area for short periods of time while in transit (HT Harvey 2022).

Coastal Cutthroat Trout

Coastal cutthroat trout are listed as a Species of Special Concern by the CDFW. They extend from the Seward River in Southern Alaska to the Eel River in Humboldt County. Their life history strategies are variable, and they may move between Humboldt Bay and coastal habitats to forage as mobile adults or remain in freshwater streams. Humboldt Bay is at the southern end of their range, but its tributaries are thought to sustain its own population. Coastal cutthroat trout may occur within the wetted channel of the Proposed Project area (HT Harvey 2022).

Green Sturgeon – Southern DPS (Acipenser medirostris)

Green sturgeon are long-lived anadromous fish that range from Southern California through Alaska. The larger population is divided into two distinct population segments, one of which is the southern DPS (sDPS) that are found in Humboldt Bay. The sDPS (Sacramento River Population) of green sturgeon are defined by those originating from the Sacramento River basin and from coastal rivers south of the Eel River in California. As of 2016, the sDPS of green sturgeon are federally threatened and considered a Species of Special Concern by the CDFW. Humboldt Bay serves as critical habitat for the sDPS of green sturgeon, but do not rely on its direct tributaries for spawning. Green sturgeon are considered the most marine-oriented of all the sturgeon species in North America. They are long-lived (unlike salmon) and highly migratory once in the ocean (HT Harvey 2022).

Adults and subadults can be found moving within nearshore coastal waters from Monterey Bay through Alaska and spend most of their lives in coastal marine waters, including Humboldt Bay. Juveniles enter bays and estuaries after only a year in freshwater and remain in marine waters until they return as adults to spawn. Green sturgeon typically access non-spawning estuaries in the summer and early fall months. Sturgeon have been documented in Humboldt Bay between April and October. Adults and sub-adults are regularly observed in deeper channels of Humboldt Bay, channel margins and mudflats when the tideflats are inundated during high tide, and around Sand Island in North Bay. They use the bay as foraging habitat. In San Francisco Bay, foraging sturgeon tend to frequent areas less than 33 feet deep, moving on and off mudflats with tidal fluctuations. Acoustic tag detections suggest that green sturgeon are moving in deep channels, and 97 percent of observations occurred at two detection locations: Arcata Channel and North Bay Main Channel near the Samoa Bridge. Tracking studies in San Francisco Bay suggest that sturgeon detections are associated with either movement or feeding activity and that directional movement of sturgeon is rapid. Taken together, these observations suggest that the large number of detections near the extreme north end of Arcata Channel likely represents an area where feeding is occurring (HT Harvey 2022).

While green sturgeon have been observed in mudflats and along eelgrass margins, depending on distance from a main channel, they do not frequent shallow habitats and it does not appear to be their preferred

habitat. The species is likely to utilize the wetted channel of the Proposed Project area, but only for short periods during their movements to and from marine and freshwater habitats. Green sturgeon are not expected to use Clam Island nor King Salmon, and are considered absent from these areas because of their shallowness (HT Harvey 2022).

Pacific Lamprey (Entosphenus tridentatus)

The Pacific lamprey is a CDFW Species of Special Concern and are widely distributed throughout the coast of California (for example, Klamath and Eel Rivers) and inland to watersheds in the Central Valley (for example, San Joaquin River and Putah Creek). Its historical distribution includes major rivers (for example, Fraser, Columbia, Trinity, Eel, Sacramento, and San Joaquin Rivers), and intervening streams. Similar to salmon, lamprey populations may be anadromous or resident and have a number of distinct runs. They spawn and rear in freshwater habitats including tributaries to Humboldt Bay, and the Eel and Mad Rivers. Adult migrations through Humboldt Bay and into tributary streams have been documented in the spring, but there is no information about potential fall migrations. In 2011 to 2013, upstream Pacific lamprey migrants were collected by CDFW in the Freshwater Creek fish weir between February and June, and downstream migrants were observed between March and July. Estuaries may be as important to lamprey as they are to salmonids for foraging and holding, and transition from freshwater to saltwater (and vice versa). Spawning occurs in gravel nests in low-gradient stream riffles from April through July. Once eggs hatch into larvae (ammocoetes), they drift downstream to low-velocity habitats and live in silty substrates as filter feeders for 3–7 years. Larvae then transform to juveniles (macropthalmia) and migrate to the Pacific Ocean. Pacific lamprey in marine environments are parasitic and dependent on their hosts, however, it is not clear the extent to which they change, kill, or switch hosts. Since Pacific lamprey hosts are likely highly mobile, particularly relative to the Project area, the species is assumed to possibly be present only on a transitory basis, if not unlikely, within the wetted channel of the Proposed Project area (HT Harvey 2022).

Eulachon – Southern DPS (Thaleichthys pacificus)

Eulachon are distributed from northern California through the Bering Sea in Alaska. In 2010, the sDPS, which spans from the Mad River in California to the Skeena River in Canada, was listed as federally threatened. The nearest designated critical habitat to Humboldt Bay is in the mainstem Mad River (HT Harvey 2022).

Although this species has historically been documented in Humboldt Bay, it is just south of the known current distribution of eulachon, so their presence is unlikely. In addition, CDFW considered eulachon to be possibly extirpated from the Mad River until recent surveys and genetic testing indicated they were present in 2020 (HT Harvey 2022). Prior to 2020, the last recorded observation of eulachon in the Mad River was in April 1976. There is low potential (unlikely) for the sDPS of eulachon to occur within the Proposed Project area (HT Harvey 2022).

Longfin Smelt (Spirinchus thaleichthys)

Longfin smelt are small, pelagic fish threatened under CESA and listed as a candidate species under the FESA. Longfin smelt are known to occur in Humboldt Bay and its tributaries, but their distribution, abundance, and life history are not well understood. Adult longfin smelt primarily spawn in low salinity, freshwater, or brackish habitats within the lower reaches of coastal rivers. Spawning is believed to occur in tributary watersheds to Humboldt Bay between November and April when water temperatures are below 16°C. Larvae have been routinely found in low salinity habitats that occur in Eureka Slough, but not in more saline sloughs within Humboldt Bay (for example, South Bay or lower Mad River Slough). The buoyant larvae are swept into more brackish waters where they rear and then move to marine

waters as juveniles and adults: during ichthyoplankton surveys led by CDFW in 2017 throughout Humboldt Bay, newly hatched larvae were found primarily in the main channel, having drifted away from the suitable spawning and rearing habitats in Eureka Slough, which provides necessary salinity levels for growth and survival of longfin smelt. Although RMT1 and the mitigation sites are not within suitable larval rearing habitat, larval longfin smelt may occur within the wetted channel of the Proposed Project area in the winter and early spring. Adults may occur in the area at any time of the year, and juveniles are more commonly present between January and March (HT Harvey 2022).

Tidewater Goby (Eucyclogobius newberryi)

The tidewater goby is a small fish, discontinuously distributed along most of the California coastline. They are federally endangered and Humboldt Bay contains critical habitat along its margins. Tidewater gobies are restricted to the upper margins of tidal bays near the entrance of freshwater tributaries and coastal lagoons and occupy relatively shallow sloughs fringing Humboldt Bay. Tidewater gobies are present year-round, and their reproduction peaks in April and May. In Humboldt Bay, the upper sloughs and high marsh areas separated from the bay by tide gates or other flow barriers provide habitat for tidewater goby, despite threats from habitat fragmentation. They generally are associated with quiescent water less than 1m deep with sandy substrate, and thus not likely found within the Proposed Project area (HT Harvey 2022).

Marine Mammals

Steller Sea Lion (Eumetopias jubatus)

The Steller sea lion, which is protected according to the MMPA rarely comes ashore on the mainland but haul out on islands and offshore rocks and even remain at sea during stormy weather. Steller sea lions are most numerous at haul-out sites during their breeding season from May through August, and their breeding peaks in June and July. A single individual may use a range of haul-out sites during a given season. Steller sea lions are not often found in river mouths, bays, or estuaries, and therefore unlikely to be present within the Proposed Project area (HT Harvey 2022).

California Sea Lion (Zalophus californianus)

California sea lions are restricted to middle latitudes of the eastern North Pacific. California sea lions do not breed along the Humboldt County coast; however, non-breeding or migrating adults (and juveniles) may occur in Humboldt Bay year-round. Two seasonal peaks of California sea lions are observed in the Project area: one during the fall northward migration and one during spring (mid-April to August) as they return to breeding colonies in the south. Non-breeders are found along docks and manmade structures, and therefore likely **to occur within the Proposed Project area** (HT Harvey 2022).

Pacific Harbor Seal (Phoca vitulina richardii)

Pacific harbor seals are protected under the MMPA and are widely distributed throughout the northern Atlantic and Pacific oceans. They occur along coastal waters, river mouths, and estuaries. The harbor seals in the Proposed Project area represent the eastern North Pacific Ocean subspecies, and aside from occasional dispersing individuals, are part of the California population. Harbor seals are the most common marine mammal within Humboldt Bay (HT Harvey 2022) and inhabit the coastline year-round. Their annual average population is around 200 individuals, but numbers may reach closer to 1,500 at peak season (HT Harvey 2022).

Harbor seals use Humboldt Bay as a pupping and haul-out area and Humboldt Bay represents the largest haul-out site in northern California. They haul onto mudflats exposed during ebb tides throughout North

and South Bay, adjacent to tidal channels in upper Arcata and the South Bay to rest and give birth. Two recognized haul-out sites have been identified in the southern reach of Arcata Bay, and four in mid-Arcata Bay, in addition to sandflats. There are also recognized haul-out sites on the North Spit, directly across from Tuluwat Island (HT Harvey 2022).

Harbor seal abundance and site fidelity to haul-out sites generally peaks in summer during pupping and molting and declines in winter when individuals disperse to seek areas of high prey abundance. Harbor seal tracking efforts using aerial surveys and radio telemetry have demonstrated site fidelity to haul-out sites, specifically in the southern reaches of South Bay during pupping season. South Bay is the main pupping location for harbor seals in Humboldt Bay between April and June, with peaks in the number of pups between the end of April and beginning of May (HT Harvey 2022).

Generally, harbor seals are opportunistic, nearshore coastal foragers that feed primarily on seasonally abundant benthic and epibenthic schooling fish. Their diet is predominantly small fishes. A recent study using radiotelemetry to characterize foraging behavior by measuring the distance from haul-out sites to foraging areas in Humboldt Bay found that some harbor seals forage inside the bay itself, and others in nearshore regions directly outside the entrance. Those foraging inside Humboldt Bay were concentrated in South Bay, and individuals foraging in nearshore regions were ones using a haul-out site elsewhere on the coast. Most seals traveled less than 14 kilometers from their primary haul-out sites to forage, which aligns with previous findings, and individuals used an average of two haul-out sites (HT Harvey 2022).

Pacific harbor seals are likely to occur in the Proposed Project area, hauling out to rest, or in transit to haul-out sites in North Bay or while foraging.

Harbor Porpoise (Phocoena phocoena)

Harbor porpoises are protected under the federal MMPA and can be found in the North Pacific range from Point Conception, California, to as far north as Barrow, Alaska, and west to Russia and Japan. Harbor porpoises from Humboldt County are included in the northern California/southern Oregon population that extends from Point Arena to Lincoln City, Oregon (HT Harvey 2022). Harbor porpoises have been observed throughout the year at the entrance to and within Humboldt Bay, usually as single individuals but sometimes in groups, with a maximum size of 12 animals (HT Harvey 2022). Abundance peaks between May and October. They are most commonly seen in deep water channels and during flooding tides (HT Harvey 2022). Harbor porpoises are likely to occur within the Proposed Project area because there are deep channels in the vicinity.

Southern Resident Killer Whale (Orcinus orca)

The Southern resident DPS of killer whales was federally listed as endangered of 2006. This subpopulation includes those ranging from central California to southeast Alaska. Critical habitat was designated for southern resident killer whales in 2021 offshore of Humboldt County in California between the 6.1-m and 200-m isobaths, which excludes Humboldt Bay. While Southern resident killer whales migrate and forage through waters off Humboldt County and are occasionally spotted at the entrance to Humboldt Bay, they rarely enter the bay itself and are unlikely to be present at the Proposed Project area (HT Harvey 2022).

Table L. Special-status Marine Animals Species List* Humboldt Bay Off-shore Wind Marine Terminal Project

Scientific Name	Common Name	FedList	CalList	Habitat	Timing/Comments	Potential of Occurrence
Seabirds/Waterfowl						
Brachyramphus marmoratus	Marbled murrelet	T	E	Lower montane coniferous forest, old growth Redwood. Feeds near-shore. Nests in old-growth redwood-dominated forests, up to six miles inland, often in Douglas-fir.	Formerly occurred in small numbers (primarily in the late summer and fall) to forage in open bays and subtidal channels, and nearshore waters of Humboldt Bay (Harris 2006). These older records were primarily along the Samoa Peninsula and at the mouth of Humboldt Bay. There have been none-to-few recent records for the bay	U
Branta bernicula nigricans	Black brant	None	SSC	Humboldt Bay, eelgrass dependent, migrant offshore	Only wintering and staging birds tracked. Winter and spring resident, dependent on Humboldt Bay as foraging grounds during their northward spring migration. Most of these spring migratory foragers are found in eelgrass beds in the South Bay and some in the Eureka Channel and North Bay (Harris 2006). Present in fewer numbers in North Humboldt Bay, but increasing in numbers in recent years.	Pr (seasonally)
Fish						
Oncorhynchus clarkii clarkii	Coastal cutthroat trout	None	SSC	Humboldt Bay and its tributaries and slough channels, coastal.	Adults migrate through Humboldt Bay to feed on the coast in the spring and reenter the Bay and tributaries in the fall to spawn. Juveniles feed within Humboldt Bay.	Pr (seasonally)
Oncorhynchus kisutch	Coho salmon-Southern Oregon/Northern California ESU	T	T	Humboldt Bay and its tributaries and slough channels, coastal/oceanic.	Juveniles outmigrate through Humboldt Bay to the ocean from March through June and reenter in the fall as adults to spawn in tributaries to Humboldt Bay (October to January).	Pr (seasonally)
Oncorhynchus mykiss irideus	Steelhead-Northern California DPS	T	C (summer run only)	Humboldt Bay and its tributaries and slough channels, coastal/oceanic	Juveniles outmigrate through Humboldt Bay to the ocean in March through May. Adults move through Humboldt Bay to spawn in tributaries in fall and winter.	Pr (seasonally)
Oncorhynchus tshawytscha	Chinook salmon-California coastal ESU	T	None	Humboldt Bay and its tributaries and slough channels, coastal/oceanic	Juveniles outmigrate through Humboldt Bay to the ocean April through May. Adults migrate through Humboldt Bay to spawn in Humboldt Bay tributaries in the fall (October-January). Humboldt Bay is critical habitat at all life stages.	Pr (seasonally)
Acipenser medirostris	Green sturgeon-Southern DPS	T	None	Humboldt Bay, coastal	sDPS adults and subadults originate from San Francisco Bay and enter Humboldt Bay in April to feed and depart in Oct/Nov	Pr
Thaleichthys pacificus	Eulachon –Southern DPS	T	None	Found in Klamath River, Mad River, Redwood Creek, and in small numbers in Smith River and Humboldt Bay tributaries, coastal.	Federal listing refers to this southern DPS, which spawns between from the Mad River in California to the Skeena River in Canada. Critical habitat does not include Humboldt Bay or its tributaries. Spawn in lower reaches of coastal rivers with moderate water velocities and bottom of pea-sized gravel, sand, and woody debris.	U
Spirinchus thaleichthys	Longfin smelt	C (San Fransisco Bay Delta DPS only)	T	Humboldt Bay and its tributaries and slough channels, coastal.	Adults present in Humboldt Bay and tributaries November through April. Larvae/juveniles present in Humboldt Bay January-March	Pr (seasonally)
Entosphenus tridentatus	Pacific lamprey	None	SSC	Humboldt Bay estuaries and other Klamath/North coast flowing waters, coastal.	Adults present February through July. Spawns in freshwater rivers and streams. Ammocoetes need soft sand or mud and parasitize fish as they get larger.	U
Lampetra richardsoni	Western brook lamprey	None	SSC	Humboldt Bay and its tributaries, coastal.	Pass through Humboldt Bay during their migration to sea. Adults return through to spawn. Time spent for feeding and pre spawning is unknown.	Po (seasonally)
Eucyclogobius newberryi	Tidewater goby	E	None	Relatively shallow muted tidal sloughs fringing Humboldt Bay	Present year-round along margins of Humboldt Bay in sloughs and high marsh channels. Designated critical habitat in these fringing habitats only, and not in Humboldt Bay proper	U
Marine mammals						
Eumetopias jubatus	Steller sea lion	D; MMPA-Protected	None	Marine (coastal, continental shelf and slope) and Bay	Occurs along the continental shelf and nearshore, but rarely enters into Humboldt Bay.	U
Zalophus californianus	California sea lion	MMPA-Protected	None	Marine and Bay	Adults and juveniles are present year-round, occurring on the coastal, continental shelf.	Pr
Phoca vitulina richardii	Pacific harbor seal	MMPA-Protected	None	Marine and Bay	Present year-round in Humboldt Bay on mudflats and sandflats. Pupping occurs between April and June, primarily pup in the South Bay. Abundance declines in the winter.	Pr
Phocoena phocoena	Harbor porpoise	MMPA-Protected	None	Marine (nearshore and continental shelf) and Bay	Present year round inside Humboldt Bay, most commonly seen in deep-water channels and at the entrance to the Bay.	Pr

Scientific Name	Common Name	FedList	CalList	Habitat	Timing/Comments	Potential of Occurrence
Orinus orca	Killer whale (orca)	E; MMPA-Protected	None	Marine	Offshore waters are used for migrating and foraging. Southern resident DPS is the only subpopulation federally endangered, and this DPS has critical habitat directly outside of Humboldt Bay, but not inside the bay itself.	U

*Excerpt from HT Harvey, 2022, marine species with potential to occur at Proposed Project site or within 5 miles

1. Species indicator status as assigned by Federal Endangered Species Act (FESA), National Marine Mammal Protection Act (MMPA), California Endangered Species Act (CESA), and California Department of Fish and Wildlife (CDFW)

C: candidate
D: delisted
DPS: distinct population segment
E: endangered
ESU: evolutionarily significant unit
FP: fully protected
PT: proposed threatened
SSC: species of special concern
T: threatened
WL: watch list

2. Potential for Occurrence:

PO: Possible
Pr: Present
U: Unlikely

Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act requires direct action to stop or reverse the continued loss of fish habitats. The act requires cooperation between NMFS, the regional fishery management councils, fishing participants, federal and state agencies, and others in achieving the EFH goals of habitat protection, conservation, and enhancement. EFH identifies waters and substrates required by fish for spawning, breeding, feeding, and growth to maturity. EFH waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish. For Pacific coast species, EFH is described under four fishery management plans (FMPs) covering groundfish, coastal pelagic species, highly migratory species, and Pacific coast salmon (as detailed in the following sections). The study area supports EFH for three of the four FMPs, and Habitat Areas of Particular Concern (HAPCs) include estuaries and seagrass. EFH was evaluated using the NMFS EFH Habitat Mapper and results are summarized below (HT Harvey 2022).

Pacific Coast Groundfish EFH

Pacific Coast Groundfish represent a large number of resident species along the U.S. West Coast. The northern California coast provides groundfish habitat from the nearshore MHHW or the upstream extent of saltwater intrusion, to deep water areas (less than or equal to 3,500 m) seaward to the boundary of the U.S. Exclusive Economic Zone (EEZ). In 1998, the Pacific Fishery Management Council (PFMC) made more than 400 EFH designations for 82 groundfish species. The PFMC further defined important habitat by species and life stage.

Portions of the Proposed Project area are in Pacific coast groundfish EFH, which in Humboldt Bay, covers the North Bay, Entrance Bay, and South Bay. Pacific coast groundfish EFH likely to occur in Humboldt Bay includes flatfishes (for example, starry flounder [*Platichthys stellatus]*, speckled sanddab [*Citharichthys stigmaeus*], Pacific sanddab [*C. sordidas*]), rockfishes (for example, black rockfish [*Sebastes melanops*], blue rockfish [*S. mystinus]*), lingcod (*Ophiodon elongates)*, cabezon (*Scorpaenichthys marmoratus)*, and kelp greenling (*Hexagrammos decagrammus)*.

Coastal Pelagic EFH

Coastal pelagic species live in the water column and are found anywhere from the surface to 3,281 feet (1,000 m) deep. Coastal pelagic species that may occur in offshore waters along the northern California coast, and potentially in the Proposed Project area, include six species/species groups that are actively managed: Northern anchovy (*Engraulis mordax*), Pacific sardine (*Sardinops sagax*), Pacific mackerel (*Scomber japonicus*), jack mackerel (*Trachurus symmetricus*), California market squid (*Loligo opalescens*), and krill. The EFH for these species includes all marine and estuarine waters along the coast of northern California and offshore to the EEZ boundary line. Therefore, the Proposed Project area is in coastal pelagic EFH (HT Harvey 2022).

Coastal Pelagic EFH – Dredging Constraints

Appendix D of the Coastal Pelagic FMP explicitly states that new dredging should be avoided, including dredging for docks, and should be sited in deep waters or designed in a manner that alleviates the need for maintenance dredging. It also states that projects should be permitted only for water-dependent purposes, when there are no feasible alternatives. This Project requires deepening new areas that have not previously been dredged, and in areas that are Coastal Pelagic

EFH. New dredging at and around the Project area is necessary to support Project development as the Project is water dependent.

Pacific Coast Salmon EFH

EFH for Chinook and coho salmon includes rivers and coastal streams from central California to Alaska and oceanic waters along the United States and Canadian coasts and seaward to the north central Pacific Ocean and the high seas. The Proposed Project area contains EFH for all life stages of Chinook and coho salmon. Adult and juvenile coho and Chinook salmon forage in nearshore and offshore areas, often near shelf habitat where upwelling creates the proper temperatures and conditions for food resource production.

Highly Migratory Species EFH

Highly migratory species are pelagic fish species such as tunas, marlins, and sharks that occur worldwide and are highly mobile. They can be found in both the EEZ region out to 230 miles (370 km) from shore and the high seas; they do not occur in Humboldt Bay. Therefore, the Proposed Project area is not within EFH for these highly migratory species, as they are found significantly further offshore.

Non-Listed Marine Species

There are additional non-special-status species with commercial and recreational importance that are potentially present in the Proposed Project area. Evaluated fish species that are likely to occur include Pacific herring (*Clupea pallasii*), starry flounder, rockfish/rockcod (*Sebastes spp*.), lingcod, various species of smelt and surfperch, and the sand shark (*Mustelus henlei*). Benthic invertebrates and crustaceans, several of which are either burrowing or at the surface, are reviewed, including Dungeness crab (*Metacarcinus magister*), rock crab (*Family Cancridae*), and clams (*Tresus and Saxidomus spp.*). These species and groups are not threatened or endangered or species of concern. Rather, they are managed for human consumption by CDFW for capture or otherwise of local concern or interest.

Designated Critical Habitat

When a species is proposed for listing as endangered or threatened under the FESA, the USFWS identifies specific areas that are essential to the species' conservation. These are the species' critical habitat. Critical habitat is a tool that supports the continued conservation of imperiled species by guiding cooperation within the federal government. Designations affect only federal agency actions or federally funded or permitted activities.

The USFWS Critical Habitat Portal and NOAA Fisheries Protected Resources App (NOAA 2024) was queried for habitat designated as critical for species listed under the FESA. No critical habitat is designated within the terrestrial portion of the Proposed Project area. The next nearest terrestrial designated critical habitat is for the western snowy plover, over 4 miles southwest of the Project site. The Proposed Project will not impact this critical habitat (SHN 2024a).

Humboldt Bay waters are designated critical habitat for green sturgeon and chinook salmon California coastal ESU (HT Harvey 2022), including the marine portion of the Proposed Project area. The next nearest marine critical habitat within Humboldt Bay is for the tidewater goby, 3.1 miles to the east in tidal sloughs. Coastal oceanic habitat outside the bay is designated critical habitat for Southern resident killer whale.

Wildlife Movement

Wildlife corridors refer to established migration routes commonly used by resident and migratory species for passage from one geographic location to another. Corridors are present in a variety of habitats and link otherwise fragmented acres of undisturbed area. Maintaining the continuity of established wildlife corridors is important to sustain species with specific foraging requirements, preserve a species distribution potential and retain diversity among many wildlife populations. Habitat loss and fragmentation makes it difficult for animals to move through the landscape for daily activities and to disperse to new areas. Therefore, resource agencies consider wildlife corridors to be a sensitive resource.

Wildlife movement includes seasonal migration, inter-population movement (genetic flow), and small, daily travel pathways within an animal's territory. Although small travel pathways usually facilitate movement for daily home range activities (such as, foraging or escape from predators), they also provide connection between outlying populations and the main corridor, permitting an increase in genetic flow among populations. As climate changes, these landscape connections may also facilitate species shifts to more suitable climate conditions, and for this reason, habitat corridors, are one of the most common climate change adaptation strategies for biodiversity conservation.

Heavy vegetative cover along stormwater drainages and within the northern portion of the study area provide wildlife movement corridors around and through the Project area, although these are patchy in nature, are interrupted by roads and other development, and do not represent part of a significant connectivity corridor throughout the surrounding landscape. The previous stormwater drainage features in portions of the site are likely the best-quality portion of movement corridor within the Project site (SHN 2024a).

Several fish species migrate through Humboldt Bay including coastal cutthroat trout, coho salmon, steelhead, chinook, and Western brook lamprey, which may include the marine portion of the Proposed Project area.

Regulatory Setting

Federal

Endangered Species Act

Species listed as endangered and/or threatened by USFWS or NMFS are protected under Section 9 of the FESA, which forbids any person to take an endangered or threatened species. *Take* is defined in Section 3 of the act as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." The U.S. Supreme Court ruled in 1995 that the term *harm* includes destruction or modification of habitat. Sections 7 and 10 of the Act may authorize *incidental take* for an otherwise lawful activity (a development project, for example) if it is determined that the activity would not jeopardize survival or recovery of the species. Section 7 applies to projects where a federally listed species is present and there is a federal nexus, such as a federal CWA Section 404 permit (for example, impacts on waters of the United States) that is required. Section 10 applies when a federally listed species is present, but no federal nexus is present.

Marine Mammal Protection Act

The MMPA prohibits, with certain exceptions, the take of marine mammals in waters of the United States and by U.S. citizens on the high seas and the importation of marine mammals and marine mammal products into the United States. Congress passed the MMPA based on the following findings and policies: (1) some marine mammal species or stocks may be in danger of extinction or depletion as a result of human activities, (2) these species of stocks must not be permitted to fall below their optimum sustainable population level (depleted), (3) measures should be taken to replenish these species or stocks, (4) there is inadequate knowledge of the ecology and population dynamics, and (5) marine mammals have proven to be resources of great international significance.

The MMPA was amended substantially in 1994 to provide for: (1) certain exceptions to the take prohibitions, such as for Alaska Native subsistence, and for permits and authorizations for scientific research; (2) a program to authorize and control the taking of marine mammals incidental to commercial fishing operations; (3) preparation of stock assessments for all marine mammal stocks in waters under U.S. jurisdiction; and (4) studies of pinniped-fishery interactions. NMFS and USFWS administer the MMPA. The Proposed Project must be analyzed to ensure that marine mammals protected under the MMPA would not be harassed or injured as a result of Project activities in or adjacent to Humboldt Bay. Any Project activities that may result in Level A or B harassment, injury, or mortality would require consultation with NMFS and USFWS under the MMPA.

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (16 U.S.C. Sections 661-667e, March 10, 1934, as amended 1936, 1946, 1947, 1948, 1949, 1958, 1965, 1978, and 1995; USFWS, 1934) requires that whenever waters or channel of a stream or other body of water are proposed or authorized to be modified by a public or private agency under a federal license or permit, the federal agency must first consult with the USFWS and/or NMFS and with the head of the agency exercising administration over the wildlife resources of the state where construction will occur (in this case the CDFW), with a view to conservation of birds, fish, mammals, and all other classes of wild animals and all types of aquatic and land vegetation upon which wildlife is dependent.

If direct permanent impacts will occur to Waters of the U.S. from a Proposed Project, then a permit from USACE under CWA Section 404 is required for the construction of the Proposed Project. USACE is required to consult with USFWS and/or NMFS as appropriate regarding potential impacts to federally-listed species under FESA. Such action may prompt consultation with CDFW, which would review the project pursuant to CESA and issue a consistency letter with USFWS and/or NMFS, if required.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) domestically implements a series of international treaties that provide for migratory bird protection. The MBTA authorizes the Secretary of the Interior to regulate the taking of migratory birds. The act further provides that it is unlawful, except as permitted by regulations, "to pursue, take, or kill any migratory bird, or any part, nest or egg of any such bird…" (16 U.S.C. §§ 703–712). This prohibition includes both direct and indirect acts, although harassment and habitat modification are not included unless they result in direct loss of birds, nests, or eggs. The current list of species protected by the MBTA can be found in the November 1, 2013 *Federal Register* (78 FR 65844–65864). This list comprises several hundred species, including essentially all native birds. Permits for take of nongame migratory birds can be issued only for

specific activities, such as scientific collecting, rehabilitation, propagation, education, taxidermy, and protection of human health and safety and of personal property. USFWS publishes a list of birds of conservation concern to identify migratory nongame birds that are likely to become candidates for listing under FESA without additional conservation actions. The birds of conservation concern list is intended to stimulate coordinated and collaborative conservation efforts among federal, state, tribal, and private parties.

Clean Water Act Section 404 Wetlands

Under Section 404 of the CWA, wetlands are “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas" (USEPA 2019). Two general categories of wetlands are recognized: coastal or tidal wetlands, and inland or non-tidal wetlands. USACE defines three characteristics of wetlands: hydrology, hydrophytic plants, and hydric soils. An area must exhibit all three characteristics to be considered a “jurisdictional wetland.” Some areas may perform the functions of wetlands, yet not be delineated as jurisdictional wetlands if they do not exhibit all three wetland characteristics.

USACE and USEPA 2008 Compensatory Mitigation for Losses of Aquatic Resources; Final Rule

When there is a proposed discharge of dredged or fill material into wetlands, streams, or other waters of the United States, all appropriate and practicable steps must first be taken to avoid and minimize impacts on aquatic resources. For unavoidable impacts, compensatory mitigation is required to replace the loss of wetland, stream, and/or other aquatic resource functions. The rule provides standards to promote no net loss of wetlands by improving wetland restoration and protection policies, increasing the effective use of wetland mitigation banks, and strengthening the requirements for the use of in-lieu fee mitigation.

State

California Endangered Species Act

CESA establishes the policy of the state to conserve, protect, restore, and enhance threatened or endangered species and their habitats. CESA mandates that state agencies should not approve projects that would jeopardize the continued existence of threatened or endangered species if reasonable and prudent alternatives are available that would avoid jeopardy. For projects that affect both a state- and federally-listed species, compliance with FESA will satisfy CESA if CDFW determines that the federal incidental take authorization is consistent with CESA under CFGC Section 2080.1. For projects that would result in a take of a state-only listed species, the project proponent must apply for a take permit under Section 2081(b).

Fully Protected Species and Species of Special Concern

Sections 3511, 3513, 4700, and 5050 of the CFGC pertain to fully protected wildlife species (birds in Sections 3511 and 3513, mammals in Section 4700, and reptiles and amphibians in Section 5050) and strictly prohibit the take of these species. CDFW cannot issue a take permit for fully protected species, except under narrow conditions for scientific research or the protection of livestock or if a natural community conservation plan has been adopted.

SSC are broadly defined as animals not listed under the CESA, but that are nonetheless of concern to the CDFW because they are declining at a rate that could result in listing, or historically occurred in low numbers and known threats to their persistence currently exist. This designation is intended to result in special consideration for these animals by the CDFW, land managers, consulting biologists, and others, and is intended to focus attention on the species to help avert the need for costly listing under CESA and cumbersome recovery efforts that might ultimately be required. This designation is also intended to stimulate collection of additional information on the biology, distribution, and status of poorly known at-risk species, and focus research and management attention on them. Although the SSC designation provides no special legal status, they are given special consideration under CEQA during project review.

Native Bird Protection

Section 3503 of the CFGC prohibits the killing of birds and/or the destruction of bird nests. Section 3503.5 prohibits the killing of raptor species and/or the destruction of raptor nests. Typical violations include destruction of active bird and raptor nests as a result of tree removal, and failure of nesting attempts (loss of eggs and/or young) as a result of disturbance of nesting pairs caused by nearby human activity. Section 3513 prohibits any take or possession of birds designated by the MBTA as migratory nongame birds except as allowed by federal rules and regulations pursuant to the MBTA. To avoid violation of the take provisions, it is generally required that project-related disturbance at active nesting territories be reduced or eliminated during the nesting cycle.

Porter-Cologne Water Quality Control Act

The State and Regional Water Quality Control Board (RWQCB) also maintain independent regulatory authority over the placement of waste, including fill, into Waters of the State under the Porter-Cologne Water Quality Control Act (State Water Resources Control Board [SWRCB], 1969). Waters of the State are defined by the Act as "any surface water or groundwater, including saline waters, within the boundaries of the state." The SWRCB protects all waters in its regulatory scope but has special responsibility for isolated wetlands and headwaters. These water bodies might not be regulated by other programs, such as Section 404 of the CWA. Waters of the State are regulated by the RWQCBs under the State Water Quality Certification Program, which regulates discharges of dredged and fill material under Section 401 of the CWA and the Porter-Cologne Water Quality Control Act. Projects that require an USACE permit, or fall under other federal jurisdiction, and have the potential to impact Waters of the State are required to comply with the terms of the Water Quality Certification Program. If a Proposed Project does not require a federal license or permit but does involve activities that may result in a discharge of harmful substances to Waters of the State, the RWQCBs have the option to regulate such activities under their state authority in the form of waste discharge requirements (WDRs) or certification of WDRs.

Native Plant Protection Act of 1973

The Native Plant Protection Act (NPPA) of 1973 (Sec.1900-1913 of the CFGC) includes provisions that prohibit the taking of endangered or rare native plants from the wild and a salvage requirement for landowners. The CDFW administers the NPPA and generally regards as "rare" many plant species included on Lists 1A, 1B, 2A, 2B, 3, and 4 of the CNPS Inventory of Rare and Endangered Vascular Plants of California.

California Rare Plant Rankings

CDFW maintains lists of plants of special concern in California, in addition to those listed as threatened or endangered. These species have no formal protection under CESA, but the values and importance of these lists are widely recognized. Plants with a California Rare Plant Rank of 1A, 1B, and 2 meet the definitions of Section 1901 of the CFGC and may qualify for state listing. Accordingly, for purposes of analysis, such plant species are considered rare plants pursuant to Section 15380 of CEQA.

Natural Community Conservation Planning Act

The Natural Community Conservation Planning (NCCP) Act of 1991 is an effort by the State of California, and numerous private and public partners that is broader in its orientation and objectives than the CESA and FESA. The primary objective of the NCCP Act is to conserve natural communities at the ecosystem scale while accommodating compatible land use. The NCCP Act seeks to anticipate and prevent the controversies and gridlock caused by species listings by focusing on the long-term stability of wildlife and plant communities and including key interests in the process.

California Coastal Act

The California Coastal Act of 1976 recognizes California ports, harbors, and coastline beaches as primary economic and coastal resources and as essential elements of the national maritime industry. Decisions to undertake specific development projects, where feasible, are to be based on consideration of alternative locations and designs in order to minimize any adverse environmental impacts. The California Coastal Act is implemented by the Coastal Commission.

California Eelgrass Mitigation Policy and Implementing Guidelines

NMFS is an office of NOAA and is responsible for the stewardship of the nation's ocean resources and their habitat. NMFS developed the California Eelgrass Mitigation Policy (CEMP) in order to establish and support a goal of protecting eelgrass and its habitat functions. The CEMP includes guidance on defining eelgrass habitat, surveying, mapping, assessing impacts, avoiding, and minimizing impacts on eelgrass, and mitigation options. Avoidance and minimization measures included within the CEMP relate to turbidity, shading, circulation, and nutrient and sediment loading impacts. Mitigation options include comprehensive management plans, in-kind mitigation, mitigation banks and in-lieu-fee programs, and out-of-kind mitigation. NMFS has provided this policy to other state and federal agencies, including CDFW, as guidance for handling project-related impacts on eelgrass habitat. The California Coastal Commission typically relies on CEMP guidance when assessing projects that may affect eelgrass.

California Wetlands Conservation Policy

The goals of the California Wetlands Conservation Policy, adopted in 1993 (EO W-59-93), are "to ensure no overall net loss, and achieve a long-term net gain in the quantity, quality, and permanence of wetlands acreage and values in California, in a manner that fosters creativity, stewardship, and respect for private property"; to reduce procedural complexity in the administration of state and federal wetlands conservation programs; and to make restoration, landowner incentive programs and cooperative planning efforts the primary focus of wetlands conservation.

Local

Humboldt Bay Area Plan (HBAP) for the Humboldt County Local Coastal Program

The Humboldt Bay Area Plan (HBAP), certified in 1982, represents one of six county coastal planning areas and identifies land uses and standards by which development will be evaluated within the Coastal Zone. The indicated uses and standards adopted by the County of Humboldt, and certified by the California Coastal Commission, are in conformance and satisfy the policies and requirements for coastal land use contained in the California Coastal Act of 1976 (Public Resources Code [PRC] 30000 et seq.) and other related legislation. Local policies and standards developed in the area planning workshops specific to the Coastal Act also affect the review of projects. All current County adopted planning documents, County ordinances, and State law regulating planning and land use, unless superseded by policies of the HBAP, also govern the evaluation of any proposed development.

Humboldt Bay Eelgrass Comprehensive Management Plan

Although the CEMP provides statewide uniformity in governing standards and resource management principles with respect to eelgrass, it also includes provisions for the development of Comprehensive Management Plans (CMPs) to develop region or system specific approaches to achieving the objectives of the CEMP. The Humboldt Bay Eelgrass CMP provides an ecosystem-based management approach to:

- Ensure that the sum of individual eelgrass restoration and protection actions in the Bay has the greatest benefit to eelgrass and eelgrass functions,
- Facilitate more efficient regulatory processes for projects in the Bay, and
- Provide a long-term eelgrass habitat conservation strategy that allows for sea level rise adaptation, dredging, and economic development in Humboldt Bay.

Discussion

a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

There are affected species and habitats identified within the Proposed Project areas as candidate, sensitive, or special status. Site specific studies have determined the resources on the site and will lead to proposed mitigation to address the Project's impacts. The Project will result in both construction and operational impacts. Potential effects from Project development include habitat loss for special status species known to use the site for nesting, permanent impacts to special-status plants, and impacts to Environmentally Sensitive Habitat Areas. Potential long-term effects would be caused by operational disturbance including noise and lighting. Mitigation for the potential effects has the potential to enhance habitat outside the Project area to compensate for impacts of the Project. Avoidance, minimization, and mitigation measures will be implemented to reduce potential impacts to the extent feasible.

b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

There are affected Environmentally Sensitive Habitat Areas, including riparian habitat and other sensitive natural communities, at the Project site. Special studies have determined and mapped the resources on the site and will lead to proposed mitigation to address the Project's impacts. Sensitive natural communities mapped at the Project site are to be mitigated at an appropriate replacement ratio off-site and on-site. The Project will result in both construction and operational impacts. Potential effects of the Project include impacts to Environmentally Sensitive Habitat Areas including riparian habitat, eelgrass and other sensitive natural communities. The EIR will evaluate the loss of habitat during construction and the long-term disturbance and interference of operational impacts.

c. Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marshes, vernal pools, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means?

There are State and Federally protected wetlands at the Project site. The Project includes the filling of wetlands and re-establishing wetlands elsewhere on and off site. Potential effects include net loss of wetland habitat, though the re-establishment of wetland habitat would be required outside the Project development footprint. Wetland creation or enhancement off-site would be at an appropriate ratio to replace the area of wetlands that would be removed, and potentially be of higher quality once established. A mitigation plan for freshwater wetland impacts has been developed and will be incorporated into further analysis.

The EIR will evaluate permanent wetland loss during construction, any temporal loss in recreating wetlands, and the long-term disturbance of Project operations.

d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Potential effects include displacement of nursery sites (e.g., for osprey) and interference of wildlife movement (e.g., for special status fish species including salmonids and green sturgeon), although mitigation will reduce or avoid these impacts. Avoidance, minimization, and mitigation measures will be developed to reduce impacts on wildlife nursery sites and movement corridors.

e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

The EIR will evaluate consistency of the Project with the Humboldt Bay Area Plan (HBAP) for the Humboldt County Local Coastal Program and the Humboldt Bay Eelgrass Comprehensive Management Plan.

f. Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?

There is no adopted HCP, Natural Community Conservation Plan (NCCP), or other approved local, regional, or state HCP at or near the Project Site.

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V. Cultural Resources

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:					
a.	Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?	☒	☐	☐	☐
b.	Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	☒	☐	☐	☐
c.	Disturb any human remains, including those interred outside of dedicated cemeteries?	☒	☐	☐	☐

Affected Environment

This section describes the regulatory and environmental setting in the Proposed Project area related to cultural resources during construction and operation of the Project. This section includes non-confidential portions of the document "A Preliminary Archeological Investigation Report for the Humboldt Bay Offshore Wind and Heavy Lift Marine Terminal Project on the Samoa Peninsula in Humboldt County, California. September 16, 2022." The terrestrial portion of the Project Site (termed the Area of Potential Effect (APE) in the cultural resources report prepared for the Project) included the upland Project Site and the nearshore components proposed within Humboldt Bay.

The following subjects are related to, but are evaluated in other sections of this Initial Study.

- Potential impacts related to Tribal Cultural Resources are evaluated in Section XVIII (Tribal Cultural Resources).

The term cultural resources, as used in this document, refers to all built environment (e.g., structures, bridges, railroads, water conveyance systems, etc.) resources, culturally important resources, and archaeological resources (both prehistoric and historic), regardless of significance. This section describes the regulatory and environmental setting for cultural resources in the vicinity of the Project. It also describes the effects on cultural resources from implementation of the Project Area, as well as mitigation measures that would reduce significant impacts (ICF 2020).

Geomorphic Context

The basement rock in the Humboldt Bay region is the Franciscan Formation (ICF 2020). It is unconformably overlain by the Wildcat Group, a late Miocene to middle Pleistocene-aged sequence of marine and terrestrial deposits. At Eureka, the Wildcat Group is overlain by middle and late Pleistocene-aged coastal plain and fluvial deposits called the Hookton Formation, which is expected to be as much as 400 feet (ft) thick. Along the margins of Humboldt Bay, the Hookton Formation is overlain by bay muds and other estuarine deposits estimated to be less than 5-6,000 years old (ICF 2020).

Humboldt Bay formed in the late-Pleistocene and early Holocene between 15,000 and 10,000 years ago as sea levels transgressed, filling the mouths of the Mad, Eel, and Elk River valleys (Schlosser and Eicher 2012). During that period, the eustatic sea level typically rose 20.7 ft (6.3 meters [m]) every thousand years, with accelerated rise between 14,000–13,000 years ago (23.6 m rise) and 12,000 and 11,000 years ago (17.0 m rise) (ICF 2013). Subsequent to the formation of Humboldt Bay, the Mad River cut a new channel north of the bay, and the Eel River was diverted by the tectonic uplift of Table Bluff to the south. Today, the shoreline at Humboldt Bay is approximately 400 ft higher than it was 15,000 years ago and the bay is fed by Elk River, Jacoby Creek, Freshwater Creek, Salmon Creek, and a number of smaller streams (ICF 2020).

The northern spit of Humboldt Bay was formed on sedimentary and volcanic rocks deposited on the ocean floor that were later deformed and metamorphosed. As sea levels rose after the last glacial maximum and shorelines migrated east toward their current position, the Humboldt Bay spit primarily formed by longshore transport of river sediment from the Mad and Little Rivers prograded across the mouth of the bay (Schlosser and Eicher 2012). During the Holocene, these areas were traditionally shifting sand dunes, which Llewelyn Loud described as being 85 ft tall and a threat to any settlement built on the attractive bay shore leeward of the north spit dunes. More recently, formerly shifting dunes have been subject to overstabilization using both native species and non-native species such as European beachgrass (Ammophila arenaria) and iceplant (Carpobrotus edulis; ICF 2020).

A sounding map from 1852 shows the natural depth of the bay at mean low tide was as deep as 18 ft (5.5 m), but with significant sandbars no more than several feet below the surface. Littoral areas were between 8 and 9 ft (2.4 and 2.7 m) deep. Today, the U.S. Army Corps of Engineers (USACE) dredges Humboldt Bay shipping channels to between 38–48 ft (12–15 m) deep (ICF 2020).

In summary, determining precisely when Humboldt Bay was inundated is difficult, as several variables must be considered. Sea levels rose approximately 400 ft within the last 15,000 years, forming Humboldt Bay and likely eroding or inundating any previously terrestrial archaeological sites. In addition, tectonic uplift was simultaneously occurring. Since that time, alluvial and marine sedimentation would have added overburden atop any remaining cultural strata and thus increasing its depth below current surfaces (ICF 2020).

The terrestrial portion of the Project Site (termed the Area of Potential Effect (APE) in the cultural resources report prepared for the Project) included the upland Project Site and the nearshore components proposed within Humboldt Bay. The APE is located in Wiyot ancestral lands within and surrounding Humboldt Bay and has a long history of previously disturbed and filled lands. (Roscoe and Associates 2022)

The following section describes the environmental setting for cultural resources within the APE. Potential impacts to cultural resources would be confined to the actual Project Site, but the setting of both the Project Site and immediate vicinity are described to account for uncertainties about potential locations of buried cultural and paleontological resources. (Roscoe and Associates 2020)

The Project Area is located on the Samoa Peninsula, one mile west of Eureka, California. This is within the traditional territory of Wiyot Tribe, which once encompassed several hundred square miles extending from the Bear River Mountains in the south to the Little River in the north; and in general, the first mountain range crest to the east. The territory was divided into three regions, with the inhabitants of each speaking a mutually intelligible language: lower Mad River (batwat), Humboldt Bay, including the current Project Area (wiki), and lower Eel River (wiyot). It is the name

of the Eel River division, which is now used exclusively in accounts pertaining to the entire group. (Roscoe and Associates 2020)

The Wiyot language has been categorized as Algonquian-based. In it, the people called themselves the Soo-lah-te- luk. The name “Wiyot” itself is derived from the Yurok term “weyetor “weyot”; the Yurok, who lived to the north, also spoke a language classified as Algonkian. Although the Wiyot and Yurok languages are distinctly different, linguists have linked the two in “a provisional group called Ritwan” that is alternatively classified as Algic. (Roscoe and Associates 2020)

Based on archaeological and linguistic evidence, it is believed the Wiyot entered the area around 1050 BP [900 AD] from the Columbia River Plateau. The Yurok probably entered the region some 200 years later, taking up residence north of the Wiyot territory. The Tolowa, Chilula, and Hupa (Athapascan group) followed in 650 BP [1300 AD]. (Roscoe and Associates 2020)

Ethnographic sites in the Project vicinity which were mapped by L.L. Loud during his field work in 1913, include CA- HUM-21, and -22. These sites were mapped by Loud and plotted on the east side of the Peninsula, close to the shore of the Humboldt Bay channel. Two known archaeological sites are documented in the current APE (CA-HUM-21 and CA-HUM-22). Both are documented in areas covered by concrete, and neither was observed during the pedestrian field survey. In order to investigate for these sites and any other archaeological deposits within the APE, the archaeological investigation also included monitoring the geotechnical borings excavated by SHN, the excavation of eleven (10 centimeters [cm]) auger units and twelve backhoe trench units. Unfortunately, many of the sites described by L.L. Loud over a century ago have been damaged or destroyed since the early 1900's. It is likely that the two ethnographic Wiyot village sites mapped by Loud in the vicinity of the Project Area were damaged or destroyed during construction activities throughout the 20th century. Historical aerial imagery shows huge changes to the landscape during construction, the entire area was excavated, graded, and filled between 1958 and 1965. (Roscoe and Associates 2020)

Historic Context

European expeditions began to “discover” Humboldt Bay in 1806, though the greatest impact to indigenous peoples came during the California Gold Rush, which brought immigrant settlement to Humboldt Bay. The massacres of 1860 resulted in the destruction of Wiyot communities and culture so that few indigenous people remained on the Peninsula. The Peninsula has been the subject of more intense study over the last twenty years and documentation of early habitation is still ongoing. (Roscoe and Associates 2020)

The California Gold Rush created a demand for timber for mining, railroads, shipping, and building throughout California. This was the era of tidewater lumber from 1850-1882 where sailing ships and steam powered sawmills were dominant. Ryan, Duff & Company in 1852 ran a ship, the Santa Clara, aground at Eureka and then used the engine to power their first mill. Axe men and oxen teams harvested timber from forests close to water's edge and tram and skid roads made it easier to drag logs to the edge of the water. Logs were rafted to tidewater-sited mills along Humboldt Bay and Trinidad Bay, where sailing ships then carried the export lumber to San Francisco and ports on the Pacific Coast. (Roscoe and Associates 2020)

In 1861, George M. Fay and his brother Nathan set up a shipbuilding business in what was known as Finntown, between Fairhaven and Samoa. Already a noted shipbuilder, Hans Bendixsen purchased 4.11 acres in Fairhaven from the Fay brothers in 1873 and moved his shipyard out of Eureka. The first permanent Caucasian settler on the Peninsula was John Henry Brown, a dairyman who

established a ranch near the present-day town of Samoa in 1865. Most development was close to the shore, since the forests were dense, there were no roads, and access around the Bay was only by ship. In 1889, local real estate developers formed the Samoa Land and Improvement Company and purchased 270 acres of land on the Peninsula opposite Eureka and laid out the town of Samoa. T.A. Pennington built the first resort on the Bay in 1891, on the site where the Samoa Block is now located. The bathhouse contained a steam-heated indoor pool for men, another for women and children, with showers, dressing rooms, and a private dock. (Roscoe and Associates 2020)

The turn of the century ushered in a lumber boom with an infusion of investors from the East who enabled the construction of larger mills and railroads to log the interior forests. After the Vance Mill & Lumber Company's Eureka mill burned in 1892, the owners decided not to rebuild the mill in Eureka but to purchase cheaper land in West Eureka (Samoa) from the Samoa Land Company. This was also a period of technological innovation, with steamships replacing sailing ships and rail lines replaced oxen. Dry level land above the tideline in Samoa was limited, so the Vance Lumber Company filled in the shoreline before erecting any buildings. A wall of sand was created around the entire waterfront, with a layer of redwood bark 12 feet thick on three sides. A sawmill and shop complex were constructed along with docks and wharves to accommodate large sailing ships and, later, for steamships. The Eureka and Klamath rail line were constructed in 1896 by the lumber company. In 1899 they constructed depots in Samoa and Arcata, with a car shop and roundhouse in Samoa. Vance Avenue and the rail line adjacent to the Samoa Pulp Mill site are remnants of this period. (Roscoe and Associates 2020)

In 1900, A.B. Hammond purchased the Vance mill and property. The first worker housing was constructed in 1903, including single-family cottages and bunkhouses for single men. By 1912, the Hammond Lumber Co. had purchased all remaining privately-owned residences in Samoa. They eventually acquired the tracts south of Samoa along Humboldt Bay, as well as lands adjacent to their rail line on the Peninsula. Extensive building in both the town and the mill yard was conducted in two phases between 1900 and 1930. The mill was completely upgraded, and the rail yard buildings expanded. Additions to the town included offices and shops at the Samoa Block, the butcher shop and cold storage plant, the bakery, ice plant; a new cookhouse; new houses along Cutten, Cadman Court, Rideout, Vance and Bayview; along with remodeling of a lodging house into homes on Vance; and the construction of the Hostelry. The bathhouse and dock were demolished and replaced with a new wharf. A second phase of construction in the 1920s added a new gymnasium, a Men's Recreation Hall for the residents of the bunkhouses, the Women's Club House, new worker neighborhoods, a Craftsman Bungalow Manager's House, and the paving of Vance Avenue and residential streets. (Roscoe and Associates 2020)

Over time, some operations would be expanded while others were phased out-as the company changed its product line. Hammond had invested in the Bendixsen shipbuilding operation in Fairhaven and other mills on the Peninsula. The company had constructed a second yard south of town during WWI, north of the Samoa Pulp Mill, but this was only a temporary measure. With the completion of an overland rail line in 1914, extensive road building locally, and new highways from the 1930s through the 1950s, the rail yard turned to servicing trucks and other equipment. Many of the resources constructed by the Hammond Lumber Company in the company town and Rail Yard are intact and have been proposed for listing in the National Register. Most of the original Mill Yard buildings and structures in Samoa have been demolished as health and safety hazards. (Roscoe and Associates 2020)

During the 1930s, the lumber industry entered an era of transition. The Great Depression had slowed construction everywhere and only four lumber companies remain in operation in Humboldt County, including the Hammond Lumber Company. Mills that had been marginally profitable became insolvent and many of the small lumber companies were soon absorbed by the larger operations. Major fires from 1936-1939 caused timber losses throughout the region, soon trucks and tractors begin to replace logging railroads in field operations. When a major fire in Trinidad destroyed timberlands, railroads and bridges in 1946, railroad lines were not reconstructed. After World War II, the demand for lumber rose to its highest level in 40 years. Redwood was still in demand for lumber, but the industry soon turned to undeveloped timber lands and untapped stands of Douglas Fir, which could also be used for plywood and pulp. Truck transportation and improved roads made residential logging camps unnecessary, and rail use also declined. Roads had improved on the Peninsula and some workers now preferred to reside in nearby towns and commute, though many families preferred to raise their families in Samoa. Numerous small mills abounded in Humboldt County, though increased mechanization within the industry also led to a decline in the number of workers in the mills, and in the woods. (Roscoe and Associates 2020)

Local business leaders were concerned about long-term job potential in the lumber industry, and this had triggered a community-wide discussion about industrial development and the direction of the lumber industry in Humboldt County. At that time, the demand for lumber was the highest in 40 years, but was now competing with new building materials such as plywood, plastics, aluminum, and steel. While redwood lumber was still in demand, untapped stands of Douglas Fir could also be used for plywood and pulp. Lobbying for a pulp mill had begun more than ten years before the first one would be constructed. In 1954, the Stanford Research Institute had identified pulpwood as a major growth area in the forest products industry. Minimizing the amount of waste in the field and in the mill had become more cost effective with advent of wood products such as artificial boards. Abundant sources of waste wood were available locally, however a significant factor in attracting a pulp mill would be the ability to provide reliable water sources. (Roscoe and Associates 2020)

Timber/Pulp Mill Industries

A study of water resources on the North Coast, completed in 1957, concluded that construction of a dam on the Mad River at Ruth in Trinity County was the most feasible option-only if a pulp mill were located in the county and used the water. Based on a Preliminary Report made to the Board of Supervisors in 1955, the Citizens Committee of Humboldt County for Industrial Development was created. Two of the Committee members were the Greater Eureka Chamber of Commerce and the Humboldt County Board of Trade. The campaign to create a water district got underway in 1956 with newspaper ads, editorials and articles targeting voters within the proposed district. The vote on March 13, 1956, with 6,972 in support and 840 opposed, was overwhelmingly in favor of creating the new water district. The Humboldt Bay Municipal Water District was formed in 1956 to develop a regional water system to serve the greater Humboldt Bay area of Humboldt County. A bond act allowing the district to issue $12 million in general obligation bonds to fund the project was later approved by sixty nine percent of the voters. (Roscoe and Associates 2020)

Since the proposed dam would be located in Trinity County, the approval of the Trinity County Board of Supervisors was also required. Residents were opposed to flooding the valley, while Trinity County officials were concerned about the loss of assessable land. The Humboldt County Grange argued that water usage did not justify building a reservoir. Negotiations moved forward when the water district agreed to pay an annual fee in lieu of lost taxes, and granted Trinity County the right to develop recreation areas adjacent to the reservoir. (Roscoe and Associates 2020)

The new Humboldt Bay Municipal Water District then entered into an agreement with Bechtel Corporation for an engineering survey of the proposed pipeline from a diversion dam at Essex to potential pulp mill sites on the Samoa Peninsula. At the time that Georgia Pacific had finalized the agreement to purchase Hammond Lumber Company, in October 1956, company president Owen Cheatham had expressed the long-term goal of constructing a mill for pulp and paper products. Long-term contracts with the pulp mills would be the key to financing the development of a regional water system, and to provide affordable water rates to local residents. On September 23, 1959, the headline on the Humboldt Standard read "Pulp Mill Contracts Inked; Ruth Dam Job Set for March, Georgia-Pacific, Simpson Agree to Buy Water from District in July, 1962. Another Kraft pulp mill operation, a collaborative venture by Simpson Paper and Fiberboard Corporation, to be located in Fairhaven, was announced in 1964, and would operate under the name Crown-Simpson. (Roscoe and Associates 2020)

The primary source of water for the Humboldt Bay Municipal Water District is R.W. Matthews Dam, which forms Ruth Lake, a 48,000 acre-feet reservoir in southern Trinity County. Diversion, pumping, and control facilities are located at Essex on the Mad River near Arcata. The District sells treated drinking water to municipal customers and untreated surface water to industrial users, serving about two-thirds of Humboldt County. For over 50 years, the District also supplied untreated water to the two pulp mills on the Samoa Peninsula until the mills shut down. (Roscoe and Associates 2020)

The Georgia Pacific Corporation 1956-1972

In 1956, the Hammond Lumber Company and all its assets were sold to Georgia Pacific for $75,000,000. Georgia Pacific had been founded in 1927 in Augusta, Georgia, by Owen R. Cheatham as the Georgia Hardwood Lumber Co., a wholesaler of hardwood lumber. From 1941-1945 it was the largest supplier of lumber to the U.S. armed forces.

Determined to establish itself in the Western forest and building supply markets, in 1947 the company acquired their first West Coast facility, a plywood plant at Bellingham, Washington. In 1948, the company name was changed to Georgia-Pacific Plywood & Lumber Co. and added plywood mills at Olympia, Washington, and Springfield, Oregon. In 1953, moved their headquarters from Augusta, Georgia, to Olympia, Washington. In 1954, they moved their headquarters to Portland, Oregon. In 1956, they acquired both Coos Bay Lumber Co., Coos Bay, Oregon, and the Hammond Lumber Co. Well established on the west coast, in 1957, they entered the pulp and paper business at Toledo, Oregon, with construction of a Kraft pulp and linerboard mill. (Roscoe and Associates 2020)

In 1955, Robert E. Floweree Jr., vice president of Georgia Pacific Plywood Company, purchased sufficient shares to permit him access to the Hammond Lumber Company's financial records. Newly reorganized as the Georgia Pacific Corporation in 1956, a meeting was held between Georgia Pacific and Hammond Lumber Company. As a result, what was then called "the largest lumber deal in California history" was concluded and the new Hammond-California Redwood Company became a wholly owned subsidiary of Georgia- Pacific. In 1958, a new pulp mill made use of Douglas fir logs and a stud mill utilized the plywood cores. Though upgraded several times, in 1964, a new sawmill replaced the original mill which had been in operation since 1893. The Georgia-Pacific California operations now included mills in Samoa, Big Lagoon, Carlotta, Rockport, Fort Bragg, and Cloverdale on the North Coast; Feather Falls mill in Butte County, and timberlands on the Van Duzen and Eel Rivers. (Roscoe and Associates 2020)

By far the most significant project developed by Georgia Pacific in Humboldt County, was the new bleached Kraft paper pulp mill that opened in 1965. This was the first pulp mill to be designed and constructed to use redwood chips as a raw material for bleached Kraft pulp. The GP Samoa Pulp Mill was constructed at a cost of $30,000,000 by Hoffman Construction Company of Portland, Oregon. Their contract covered all building construction, roads and railroads, utilities, equipment setting, piping and electrical systems, as well as a pulp mill dock. The first work crew arrived on February 17, 1964. By August 1965, the first load of pulp had been shipped, though the dock would not be completed until January 1966. The chip handling and log fuel facility required additions that same year. In 1966, the Crown-Simpson bleached Kraft pulp mill was built at Fairhaven, just south of the Georgia Pacific Plant. Both pulp mills would eventually produce the same basic products. (Roscoe and Associates 2020)

Along with the construction of numerous buildings and structures, site preparation included the construction of temporary and permanent roads. A water line owned by the new Humboldt Bay Water Resources District was constructed across the Peninsula and connected the mill to the waters of the Mad River. About that same time, the water treatment system was modified and there were some additions to the chip handling and storage systems. (Roscoe and Associates 2020)

The Louisiana Pacific Corporation 1972-1998

In 1971, the Federal Trade Commission challenged the Company's acquisition of 16 firms and 630,000 acres of pine forests for plywood. The Federal Trade Commission wanted the Company to divest itself of most of the plants and prohibit any further acquisitions in the forest products industry for ten years. In a negotiated settlement, Georgia Pacific agreed to transfer 20 percent of their assets to a new Louisiana Pacific Corporation, including properties in Alaska, Washington, Oregon, Idaho, Texas, and Louisiana. (Roscoe and Associates 2020)

The new corporation would be based in California, with divisions based out of Ukiah and Samoa that included three redwood sawmills. In 1973, the Louisiana Pacific Corporation was formally separated from Georgia Pacific and began to expand its holdings. While the industry once depended upon markets in the South Pacific, such as Hawaii, Australia, and New Zealand, now Japan and other Asian markets were the major clients for pulp, chips, plywood, and logs.

Though demand for pulp was still growing in the United States, the pulp industry was undergoing changes, as new mills were being constructed in Asia to compete with domestic plants. (Roscoe and Associates 2020)

Changes in Ownership 1998-2013

After Louisiana Pacific sold their Samoa Division to the Simpson Samoa Company in 1998, the Samoa Pulp Mill went through a series of owners who kept the plant in operation but made few changes to the buildings and structures on the site. Though the Pulp Mill was reopened in 2000, Simpson was primarily interested in the timber resources included in the sale and sold the town to Samoa Pacific Group LLC in 2000. The Samoa Pulp Mill remained in operation until 2005. That year, the Samoa Pulp Mill became the first Chinese-owned mill in the United States when it was purchased by Evergreen Pulp. (Roscoe and Associates 2020)

In 2006 Evergreen was sued over "significant and ongoing violations of air quality," violating the federal emission standard for hazardous air pollutants by approximately 230 percent. Another concern was the presence of numerous chemicals stored at the site, and potential for spills into

Humboldt Bay. In 2007, the California Air Resources Board, the U.S. Environmental Protection Agency, and the North Coast Unified Air Quality Management District announced a $5 million settlement with Evergreen Pulp, Inc. to protect air quality by reducing emissions of particulate matter and hazardous air pollutants. Evergreen had agreed to install scrubbers to improve air quality, when instead it suddenly halted operations in 2008, abandoning the pulp mill and the environmental remediation. (Roscoe and Associates 2020)

In 2009 a local investor, Freshwater Tissue Company, bought the plant but was unable to obtain financing during the major economic recession. An application for federal stimulus funds to convert the Samoa mill into an integrated tissue plant, which included the removal of hazardous materials, was denied. California's last pulp mill and the only chlorine- free/dioxin-free mill in the United States finally closed in 2009. In an effort to recover some costs, much of the equipment that was still in sound condition, including the boilers, was sold. Due to the hazardous materials still stored at the site at that time, the property was not sold again until 2013. (Roscoe and Associates 2020)

The Samoa Pulp Mill site was acquired by Humboldt Bay Harbor, Conservation and Recreation District in August, 2013. Two parcels were purchased at a cost of $1 with the agreement to accept responsibility for disposal of all aboveground hazardous waste. Since that time, the "liquors," chemicals used to process the pulp, have been removed by an out of state company for reprocessing and reuse. The Harbor District now owns 89 acres that were part of the Pulp Mill site. The site has now been designated Redwood Terminal Berth #2 (RMT II) and includes docks and buildings with 220,000 square feet of warehouse space, a 30 million gallon per day water treatment system and 1.5 miles of ocean outfall pipe. Much of the pulp mill equipment that remained was sold to generate funds to assist in infrastructure improvements. Working with the EPA and Coast Guard, the storage tanks and 800 truckloads of toxic chemicals from the pulp mill operations were removed by 2014. The final removal of chemical sludge was completed in 2015. Site cleanup continues in order to ready the property for leasing. (Roscoe and Associates 2020)

Tribal Consultation

During the 2022 cultural investigation, representatives of the Harbor District informally met with representatives of the local Tribal community to discuss the proposed Project. Roscoe and Associates initiated correspondence regarding this Project with local tribal representatives based on prior knowledge of the area, and professional relationships with the area's three local Wiyot groups who have shown consistent interest in the Samoa Peninsula area. This correspondence, which occurred in April and May, 2022, was conducted to request information regarding known archaeological sites within the Project's vicinity, and to discuss any potential concerns these groups may have regarding the protection of archaeological and/ or tribal cultural resources. (Roscoe and Associates 2022)

Roscoe and Associates' identification effort includes a review of regional archaeological and ethno-geographic literature, historical maps and air photos, a project vicinity record search at the Northwest Information Center in Rohnert Park, California, correspondence with the Native American Heritage Commission (NAHC) and local Native American Tribal Representatives. Two known archaeological sites are documented in the current APE (CA-HUM-21 and CA-HUM-22), and the Humboldt Bay shoreline is known to have been a favored location for Wiyot villages for thousands of years. (Roscoe and Associates 2022)

The APE is primarily covered by concrete log decks and roads previously constructed by lumber companies that have been operating in the area since the late 19th century. These conditions make

surveying for archaeological deposits impossible without subsurface investigations. Pedestrian field surveys of the APE occurred on April 22, May 02 and August 04, 2022. The pedestrian field survey to date has included the entire APE. Because most of the APE is covered in concrete, surveyors paid special attention to the few areas of exposed soil (Attachment 2, Photo 2) and areas along the Bayshore where portions of the stabilized wave slope are eroding (Attachment 2, Photo 3). The Wetland mitigation area at the northern extent of the APE is covered in thick vegetation, making survey conditions poor (Attachment 2, Photo 4). Within the wetland mitigation area, surveyors found the best opportunity to inspect for archaeological deposits along game trails and the eroding bluff along the length of the shore line (Attachment 2, Photo 5). Roscoe and Associates has also conducted a pedestrian field survey of the entire APE, as well as subsurface investigations utilizing hand augers (10cm) and a backhoe. Additionally, Roscoe and Associates monitored geotechnical borings excavated by geologists at the engineering and geological consulting firm, SHN. (Roscoe and Associates 2022)

SHN's geotechnical investigation included the excavation of three mud rotary borings to approximately 150 feet, as well as 7 cone penetrometer test (CPT) Sounding locations and three CPT Seismic Locations excavated using the hand auger to 5 feet. At one of the CPT Sounding Locations (22-C07), a 5-foot deposit of shell was encountered lying directly under the concrete base rock. In addition, SHN provided draft logs for the three mud rotary borings to Roscoe and Associates, in order to assist our understanding of the depositional context underlaying the areas of the APE located along the shoreline and covered by concrete. In general, all three borings show that between 10 and 12 feet of fill was deposited along the bay shoreline during the historic era. After the subsurface testing work was completed in the APE, Roscoe and Associates followed up with an e-mail to these three tribal representatives in September, 2022. This e-mail described the work completed, and informed the representatives that no evidence of the previously documented archaeological site was identified as a result of the subsurface testing. Additionally, Roscoe and Associates reported that the geotechnical borings conducted by SHN (2020) did not find any evidence of cultural material during their work. (Roscoe and Associates 2022)

All of the field work completed to date indicated that there is evidence of historic disturbance throughout the entire APE and no intact significant features or cultural deposits have been identified. The findings suggested that if the existing ground surface is going to be covered with imported fill with no excavation, then perhaps no further cultural investigations will be necessary. If the existing fill along the bay shore needs to be excavated and removed and new, engineered fill brought in, then the Tribes will probably want to enter into a monitoring agreement with the Harbor District. Although the entire APE appears disturbed by the construction of the mill and other infrastructure, there is a possibility that significant buried features or archaeological deposits may have survived the historic construction, filling, and grading. Existing State law provides guidance in the event that the project results in the inadvertent discovery of archaeological deposits or human remains. (Roscoe and Associates 2022)

The record search at the Northwest Information Center (NWIC) and the author's own files indicate that 22 historic-era built environment resources are documented in the APE. These resources have not yet been addressed and the historic research and a discussion regarding the National Register eligibility of this infrastructure will also be completed and included in the final report. (Roscoe and Associates 2022)

As part of the AB 52 California Environmental Quality Act (CEQA) process, in 2023, the Harbor District requested formal consultation with local tribes, in accordance with the current NAHC list on

file, and followed up with a number of meetings with tribal councils and their Tribal Historic Preservation Officer (THPO). The AB 52 process will continue throughout the CEQA process. Additional information is included in Section 3.19 Tribal Cultural Resources.

Regulatory Framework

Federal

National Historic Preservation Act, Section 106

The NHPA of 1966, as amended, sets forth national policy and procedures for historic properties, defined as districts, sites, buildings, structures, and objects included in or eligible for the NRHP. Section 106 of the

NHPA requires federal agencies to take into account the effects of their undertakings on such properties and allow the Advisory Council on Historic Preservation an opportunity to comment on those undertakings, following regulations issued by the Advisory Council on Historic Preservation. The function of Section 106 is codified in 36 CFR 800 (ICF 2020).

Because there are federal permitting needs and federal funding for the Project, formal review under Section 106 of the National Historic Preservation Act will be required for this Project. Section 106 of the National Historic Preservation Act (NHPA) requires that, before beginning an undertaking, a federal agency, or projects that the USACE fund or permit, must take into account the effects of the undertaking on historic properties and afford the Advisory Council on Historic Preservation and other interested parties an opportunity to comment on these actions.

Section 106 of the NHPA prescribes specific criteria for determining whether a project would adversely affect a historic property, as defined in 36 Code of Federal Regulations (CFR) 800.5. An impact is considered significant when prehistoric or historic archaeological sites, structures, or objects listed in or eligible for listing in the National Register of Historic Places (NRHP) are subjected to the following effects:

- Physical destruction of or damage to all or part of the property,
- Alteration of a property,
- Removal of the property from its historic location,
- Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance,
- Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features,
- Neglect of a property that causes its deterioration, and
- Transfer, lease, or sale of the property.

Cultural resource significance is evaluated in terms of eligibility for listing in the NRHP. NRHP significance criteria applied to evaluate the cultural resources for this Project are defined in 36 CFR 60.4 as follows:

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, association, and

- That are associated with events that have made a significant contribution to the broad patterns of our history; or
- That are associated with the lives of persons significant in our past; or
- That embody the distinctive characteristics of type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- That have yielded, or may be likely to yield, information important in prehistory or history.

Specific regulations regarding compliance with Section 106 state that, although the tasks necessary to comply with Section 106 may be delegated to others, the federal agency is ultimately responsible for ensuring that the Section 106 process is completed according to statute.

State

Office of Historic Preservation

The California State Office of Historic Preservation (OHP) is responsible for administering federally- and state-mandated historic preservation programs to further the identification, evaluation, registration and protection of California's irreplaceable archaeological and historical resources under the direction of the State Historic Preservation Officer and the State Historical Resources Commission.

OHP reviews and comments on federally sponsored projects pursuant to NHPA Section 106, and state programs pursuant to Public Resources Code (PRC) Sections 5024 and 5024.5, which provide policies and plans for preserving and maintaining all state-owned historical resources or eligible historical resources. OHP also reviews and comments on local government and state projects pursuant to CEQA.

A variety of programs have been created by OHP in order to manage historic resources and to determine eligibility for classification as a historic resource. The programs that OHP administer includes: the NRHP, the California Register of Historic Resources (CRHR), the California Historical Landmarks, and the California Points of Historical Interest. Each program has different eligibility criteria and procedural requirements.

California Register of Historic Resources

Cultural resource significance is evaluated in terms of eligibility for listing in the CRHR. The State Historical Resources Commission has designed the CRHR program for use by state and local agencies, private groups and citizens to identify, evaluate, register and protect California's historical resources. The Register is the authoritative guide to the state's significant historical and archaeological resources. CRHR criteria for designation include:

- Criterion 1. Associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States.
- Criterion 2. Associated with the lives of persons important to local, California, or national history.

- Criterion 3. Embodies the distinctive characteristics of a type, period, region, or method of construction or represents the work of a master or possesses high artistic values.
- Criterion 4. Has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California or the nation.

The CRHR criteria is nearly identical to the federal NRHP criteria, and are used in tandem as "1/A" or "2/B" when identifying impacts. There is a slight difference in meaning between the CRHR and NRHP regarding Criterion 3 (Criterion C in the NRHP), which will be evaluated when determining impacts and significance.

PRC Section 5024 requires state agencies to identify and protect state-owned resources that meet the listing criteria of the NRHP. Sections 5024(f) and 5024.5 require state agencies to provide notice to and consult with the State Historic Preservation Officer (SHPO) before altering, transferring, relocating, or demolishing state-owned historical resources that are listed on or eligible for inclusion in the NRHP or registered or eligible for registration as California Historical Landmarks (ICF 2020).

CEQA requires consideration of impacts of a project on unique archaeological resources and historical resources. A unique archaeological resource, as defined in PRC Section 21083.2(g), is an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, a high probability exists that it:

- Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information
- Has a special and particular quality such as being the oldest of its type or the best available example of its type
- Is directly associated with a scientifically recognized important prehistoric or historic event or person.

Section 15064.5(a) of the State CEQA Guidelines generally defines a historical resource as:

1. A resource listed in, or determined to be eligible by the State Historical Resources Commission for listing in, the CRHR;
2. A resource listed in a local register of historical resources or identified in a historical resource survey meeting the requirements in PRC Section 5024.1(g); and
3. Any object, building, structure, site, area, place, record, or manuscript that a lead agency determines is historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the determination is supported by substantial evidence in light of the whole record; or a resource determined by a lead agency to be "historical," as defined in PRC Section 5020.1(j) or 5024.1.

Historical resources are considered under CEQA as well as PRC Section 5024.1, which established the CRHR.

The CRHR includes resources that are listed in or are formally determined eligible for listing in the NRHP, as well as some California State Landmarks and Points of Historical Interest (PRC Section 5024.1; CCR Title 14 § 4850). Properties of local significance that have been designated under a local preservation ordinance (local landmarks or landmark districts), or that have been identified in a

local historical resources inventory may be eligible for listing in the CRHR and are presumed to be significant resources for purposes of CEQA, unless a preponderance of evidence indicates otherwise (State CEQA Guidelines, Section 15064.5[a][2]). The definitions, from the California Public Resources Code Section 5020.1(j) are:

"Historical resource" includes, but is not limited to, any object, building, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California. Specifically, CEQA guidelines state that the term "historical resources" applies to any such resources listed in or determined to be eligible for listing in the California Register of Historical Resources, included in the local register of historical resources, or determined to be historically significant by the Lead Agency (Title 14 CCR §15064.5(a) (1-3)).

Historic property, is defined by 36 CFR 800.16(l) as:

> Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria.

The eligibility criteria for listing in the CRHR are similar to those for NRHP listing but focus on the importance of the resources to California history and heritage. A cultural resource may be eligible for listing in the CRHR if it:

- Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
- Is associated with the lives of persons important in our past.
- Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
- Has yielded, or may be likely to yield, information important in prehistory or history.

In accordance with the California Health and Safety Code, if human remains are uncovered during ground-disturbing activities, the contractor or the project applicant immediately must halt potentially damaging excavation in the area of the burial and notify the County Coroner to determine the nature of the remains. The coroner is required to examine all discoveries of human remains within 48 hours of receiving notice of a discovery on private or state lands (Health and Safety Code, Section 7050.5[b]). If the coroner determines that the remains are those of a Native American, the coroner must contact the NAHC by phone within 24 hours of making that determination (Health and Safety Code, Section 7050[c]). Following the coroner's findings, the property owner, contractor, or project applicant, and the NAHC-designated Most Likely Descendant are to determine the ultimate treatment and disposition of the remains, and take appropriate steps to ensure that additional human interments are not disturbed. The responsibilities for acting on notification of a discovery of Native American human remains are identified in PRC Section 5097.9 (ICF 2020).

Assembly Bill 52 (AB 52)

AB 52, enacted in 2014, amended sections of CEQA relating to Native Americans. AB 52 establishes a new category of cultural resources, named tribal cultural resources (TCRs), and states that a project

that may cause a substantial adverse change in the significance of a TCR may have a significant effect on the environment. Section 21074 was added to the Public Resources Code to define TCRs, as summarized:

1. TCRs are either of the following:
    a. Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:
        1) Included or determined to be eligible for inclusion in the California Register of Historical Resources.
        2) Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1.
    b. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1. In applying the criteria set forth in subdivision (c) of Section 5024.1 for the purposes of this paragraph, the lead agency would consider the significance of the resource to a California Native American tribe.
2. A cultural landscape that meets the criteria of subdivision (a) is a TCR to the extent that the landscape is geographically defined in terms of the size and scope of the landscape.
3. A historical resource described in Section 21084.1, a unique archaeological resource as defined in subdivision (g) of Section 21083.2, or a "non-unique archaeological resource" as defined in subdivision (h) of Section 21083.2 may also be a tribal cultural resource if it conforms with the criteria of subdivision (a).

AB 52 requires the lead agency to begin consultation with any tribe that is traditionally or culturally affiliated with the geographic area. In addition, AB 52 includes the following time limits for certain responses regarding consultation:

- Within 14 days of determining that an application for a project is complete or a decision by a public agency to undertake a project, the lead agency would provide formal notification to the designated contact of, or a tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice.
- After provision of the formal notification by the public agency, the California Native American tribe has 30 days to request consultation.
- The lead agency must begin consultation process within 30 days of receiving a California Native American tribe's request for consultation.

AB 52 (Chapter 532, Statutes of 2014) establishes a formal consultation process for California Native American tribes as part of CEQA and equates significant impacts on tribal cultural resources with significant environmental impacts (new PRC § 21084.2; ICF 2020).

California Public Resources Code

As part of the determination made pursuant to PRC Section 21080.1 (CEQA), the lead agency must determine whether a project would have a significant effect on historical and archaeological resources.

Several sections of the PRC protect cultural resources and PRC Section 5097.5 protects vertebrate paleontological sites located on public land. Under Section 5097.5, no person shall knowingly and willfully excavate upon, or remove, destroy, injure, or deface, any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site (including fossilized footprints), inscriptions made by humans, rock art, or any other archaeological, paleontological, or historical feature situated on public lands, except with the express permission of the public agency that has jurisdiction over the lands. Violation of this section is a misdemeanor.

PRC Section 5097.98 states that if Native American human remains are identified within a project area, the landowner must work with the Native American Most Likely Descendant as identified by the Native American Heritage Commission (NAHC) to develop a plan for the treatment or disposition of the human remains and any items associated with Native American burials with appropriate dignity. These procedures are also addressed in Section 15046.5 of the CEQA Guidelines. Section 30244 of the PRC requires reasonable mitigation for impacts on paleontological and archaeological resources that occur as a result of development on public lands.

California Health and Safety Code

California Health and Safety Code (HSC) Section 7050.5 prohibits disinterring, disturbing, or removing human remains from a location other than a dedicated cemetery. Section 7050.5 also requires that construction or excavation be stopped in the vicinity of discovered human remains until the Coroner can determine whether the remains are those of a Native American. If determined to be Native American, the Coroner must contact the California NAHC.

California Native American Historical Cultural and Sacred Sites Act

This Act applies to both state and private lands. The Act requires that upon discovery of human remains, that construction or excavation activity cease and that the county Coroner be notified. If the remains are of a Native American, the Coroner must notify the NAHC. The NAHC then notifies those persons mostly likely to be descended from the Native American remains. The Act stipulates the procedures the descendants may follow for treating or disposing of the remains and associated grave goods.

California Coastal Act

Coastal Act Section 30244 requires that mitigation be required for adverse impacts to archaeological resources.

Regional and Local

Humboldt County

Pursuant to its general plan policy and CEQA, Humboldt County requires cultural resource surveys in association with discretionary projects. These surveys may recommend that a site or structure be given special status, thereby qualifying it for protection and other benefits. The designations relate to eligibility for inclusion on the National Register of Historic Places or the State of California Register of Historical Resources. The County also has its own Local Official Register of Historic Resources, which provides protective status to resources that have local significance. Unlike the California Register, properties cannot be listed on the County Inventory or the National Register without the owner's consent (ICF 2020).

The Humboldt County General Plan (HCGP) lays out a series of strategies to define, identify, and protect cultural resources while appropriately consulting Native American tribes residing in the county as well as other relevant parties. Many of these echo the regulatory demands of NHPA, NEPA, and CEQA. Crucially, the HCGP reiterates a PRC stipulation that the exact location of Native American grave sites, burial grounds, sacred sites, sensitive cultural places, and prehistoric and historic archaeological sites would not be publicly disclosed in order to prevent the possibility of theft or vandalism. Furthermore, the plan offers specific prescriptions for mitigating the effects of projects/programs, including avoidance of the resource, capping for protection, and data recovery (where the others are infeasible). The Humboldt County Board of Supervisors may designate areas of historical concern, in which all structures 45 years or older may be assessed for register eligibility, a process requiring written notice to all the affected property owners and at least one public hearing by the Board of Supervisors prior to approving the designation. Nominating entities would also be encouraged to nominate properties to the California Register of Historical Resources as well as registers across the federal, state, and local systems. A county Cultural Resources Advisory Committee has been created to advise County staff and Council in these matters (ICF 2020).

Humboldt Bay Area Plan – Local Coastal Plan

Archaeological and Paleontological Resources

Where new development would adversely impact archaeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.

A. PLANNED USES

The Native American Wiyot tribe, part of the Algonkian family, once occupied the Humboldt Bay area. The Humboldt County Department of Public Works has identified 117 known archaeological sites in this planning area. The Wiyots depended heavily upon the resources of Humboldt Bay, and their heritage is an important resource within the Humboldt Bay area. Areas with great archaeological and paleontological values have been identified within the planning area, as identified with the Humboldt County Public Works, Natural Resource Division.

B. DEVELOPMENT POLICIES

Reasonable mitigation measures may include but are not limited to:

- Changing building and construction sites and/or road locations to avoid sensitive areas.
- Providing protective cover for sites that cannot be avoided.

Where appropriate and with the approval of all parties concerned, provide for the removal or transfer of culturally significant material by a professional archaeologist or geologist.

Discussion

a. Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?

As described by Roscoe and Associates (2022), “The record search at the Northwest Information Center (NWIC) and the author’s own files indicate that 22 historic-era built environment resources are documented in the area of potential effect. These resources have not yet been addressed and the historic research and a discussion regarding the National Register eligibility of this infrastructure will need to be completed”.

It is currently unknown whether the historic-era built environment resources have retained their historic integrity. Since all existing buildings and structures may be demolished, the EIR will evaluate the potential impacts to historic resources.

b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?

There is the potential for affected archeological resources at the Project. While no noteworthy archaeological resources were discovered during site investigations, there remains a potential need for inadvertent discovery protocols and tribal monitoring during subsurface grading, particularly pertaining to demolition and grading activities, including the removal of underground utilities, and examining drilling cores.

c. Disturb any human remains, including those interred outside of dedicated cemeteries?

There is the potential for archeological resources at the Project. While no noteworthy archaeological resources were discovered during site investigations, there remains a potential need for inadvertent discovery protocols and tribal monitoring during subsurface grading, particularly pertaining to demolition grading activities, including removal of underground utilities and examining drilling cores, as it relates to discovery of human remains.

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VI. Energy

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:					
a.	Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☒	☐	☐	☐
b.	Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☒	☐	☐	☐

Affected Environment

State and Regional Energy Resources and Use

California has a diverse supply of fossil fuel and renewable energy resources. The state is second in the nation in electricity generation from renewable energy resources, and leads the nation in generation from solar, geothermal, and biomass energy (US EIA 2022). California is the nation's fourth largest producer of electricity from hydroelectric power and sixth largest for wind energy (US EIA 2022). Renewable resources supplied over half of the state's total in-state electricity generation. The state also has an abundant supply of crude oil with one-tenth of the nation's crude oil refining capacity. California does not have any coal reserves or production and has phased out nearly all its coal-fired electricity generation (California Energy Commission 2018).

In 2019, California was the second-largest total energy consumer among the 50 states with the transportation and industrial sectors accounting for two-fifths and one-fourth of the state's total energy consumption, respectively (US EIA 2022). Despite its many energy-intensive industries, California has one of the lowest per capita energy consumption levels in the United States due in part to its mild climate and its energy efficiency programs (US EIA 2020).

In Humboldt County, currently utilized energy resources consist primarily of natural gas deposits and local biomass derived from lumber mill wood residue. Local biomass resources provide approximately 25 to 30 percent of the County's electricity needs (Humboldt County 2017). Other primary energy used within the County is mostly imported. Key renewable energy resources also exist within the County and include biomass, wind, wave, and small run-of-river hydroelectric.

Gasoline and diesel consumption for light-duty vehicles in the County in 2010 was approximately 76 million gallons (Humboldt County 2017). In 2020, total electricity usage for Humboldt County was approximately 774.5 gigawatt-hours (GWh) (California Energy Commission 2020a), and total natural gas usage was approximately 30.95 million Therms (California Energy Commission 2020b). Over the next two decades, electricity and natural gas demand in the County is estimated to grow at a range of 0.5 to 2.5 percent per year (Humboldt County 2017).

Regulatory Setting

Federal

Energy Policy Act (2005)

The Energy Policy Act of 2005, intended to establish a comprehensive, long-term energy policy. The Energy Policy Act addresses energy production in the United States, including oil, gas coal, and alternative forms of energy and energy efficiency and tax incentives. Energy efficiency and tax incentive programs include credits for the construction of new energy-efficient homes, production or purchase of energy-efficient appliances, and loan guarantee for entities that develop or use innovative technologies that avoid the production of greenhouse gases (GHGs).

Update to Corporate Average Fuel Economy Standards (2009)

The Corporate Average Fuel Economy (CAFE) standards incorporate stricter fuel economy standards promulgated by the State of California into one uniform standard. Additionally, automakers are required to cut GHG emissions in new vehicles by roughly 25 percent by 2016. The federal Environmental Protection Agency (EPA), the National Highway Traffic Safety Administration (NHTSA), and the California Air Resources Board (CARB) issued joint Final Rules for CAFE standards and GHG emissions regulations for 2017 to 2025 model year passenger vehicles, which require an industry-wide average of 54.5 miles per gallon (mpg) in 2025.

State

Building Energy Efficiency Standards – Title 24

The California Building Standards Code, Title 24 contains the regulations that govern the construction of buildings in California. The California Energy Commission (CEC) updates the Building Energy Efficiency Standards (Title 24, Parts 6 and 11) every three years. Part 6 is California's Energy Efficiency Standards for Residential and Nonresidential Buildings and Part 11 is the California Green Building Standards. The CEC adopted the most recent 2022 Building Energy Efficiency Standards in 2021. Buildings whose permit applications are applied for on or after January 1, 2023, must comply with the 2022 Energy Code.

Assembly Bill 2076, Reducing Dependence on Petroleum (2000)

Pursuant to AB 2076, CEC and CARB prepared and adopted a joint agency report in 2003, *Reducing California's Petroleum Dependence*. Included in this report are recommendations to increase the use of alternative fuels to 20 percent of on-road transportation fuel use by 2020 and to 30 percent by 2030, significantly increase the efficiency of motor vehicles, and reduce per capita vehicle miles traveled (VMT) (California Energy Commission and California Air Resources Board 2003). A performance-based goal is to reduce petroleum demand to 15 percent less than 2003 demand by 2020.

Assembly Bill 1493, Pavley Rules (2002, amendments 2009)/Advanced Clean Cars (2011)

Known as Pavley I, AB 1493 provided the nation's first GHG standards for automobiles. AB 1493 required CARB to adopt vehicle standards that will lower GHG emissions from new light-duty autos to the maximum extent feasible beginning in 2009. Additional strengthening of the Pavley standards (referred to previously as Pavley II and now referred to as the Advanced Clean Cars [ACC] measure)

was adopted for vehicle model years 2017–2025 in 2012. Together, the two standards are expected to increase average fuel economy to roughly 54.5 mpg in 2025. The increase in fuel economy will help lower the demand for fossil fuels.

Executive Order S-01-07, Low Carbon Fuel Standard (2007)

Executive Order (EO) S-01-07 mandated (1) that a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020 and (2) that a low carbon fuel standard for transportation fuels be established in California. The EO initiated a research and regulatory process at CARB. CARB has since adopted and implemented the Low Carbon Fuel Standard, which requires a progressive reduction in the carbon intensity of fuels over time.

Regional and Local

Humboldt County

General Plan

The Humboldt County General Plan was adopted on October 23, 2017 and provides a comprehensive update to the 1984 General Plan (Humboldt County 2017). The Energy Element of the General Plan contains the following goals and policies relevant to energy.

- E-G2: Decrease energy consumption through increased energy conservation and efficiency in building, transportation, business, industry, government, water and waste management.
- E-G3: Increased local energy supply from a distributed and diverse array of renewable energy sources and providers available for local purchase and export.
- E-P3: The County shall support renewable energy development projects including biomass, wind, solar, "run of the river" hydro-electric, and ocean energy, consistent with this Plan that increases local energy supply.
- E-P13: Encourage the use of renewable energy and environmentally preferable distributed energy generation systems in the County.
- E-P15: Coordinate with local agencies, communities, and landowners to assess potential wind and offshore renewable energy development. Such an assessment shall consider site suitability, energy potential, and potential impacts to biological and cultural resources.

Humboldt Bay Area Plan – Local Coastal Plan

There are no applicable policies or goals in the Humboldt Bay Area Plan that address energy use for industrial land use designations.

Redwood Coast Energy Authority

RePower Humboldt

RePower Humboldt is the Redwood Coast Energy Authority's (RCEA's) comprehensive action plan for energy. The County of Humboldt recognizes RCEA as the regional energy authority to foster, coordinate, and facilitate the countywide strategic energy planning, implementation, and education. RePower Humboldt includes the following energy goals (RCEA 2019).

- By 2025, 100% of RCEA's power mix will be from a combination of state-designated renewable energy sources—solar, wind, biomass, small hydroelectric, and geothermal— and state-designated net-zero-carbon-emission existing large hydroelectric facilities.
- By 2030, achieve net-zero greenhouse gas emissions county-wide.
- By 2030, fully establish Humboldt County as an energy secure community that can affordably and reliably meet its local energy needs with local renewable resources.
- Build the clean energy sector into a cornerstone of the local economy through a breadth of strategies that include innovation, research and development, local energy-related business development, and establishing Humboldt Bay as the primary west coast hub for the offshore wind energy.
- By 2030, reduce greenhouse gas emissions from transportation by over 65% through reductions in vehicle miles traveled, improved vehicle efficiency, the adoption of electric vehicles, and, where determined to be an effective emissions-reduction strategy, the use of biofuels as a bridge to a full transition to zero-emissions vehicles.

Humboldt County Climate Action Plan

There is no adopted climate action plan (CAP) for Humboldt County. However, Humboldt County is in the process of developing a regional CAP with local agencies. The CAP would explore locally oriented strategies to reduce emissions from vehicle travel, livestock, electricity consumption, and other sources of GHGs. The County released a draft CAP for public review in April 2022 (Humboldt County 2022). Adoption of the Humboldt County CAP is not anticipated until August 2023.

Discussion

a. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

The EIR will evaluate the Project's anticipated energy use and fuel consumption during construction and operations to assess if the Project may result in wasteful, inefficient, or unnecessary consumption of energy resources. As part of this evaluation, the EIR will analyze potential impacts from new electrical infrastructure, including substations, microgrids, transmission lines, and offsite solar panels.

b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

The EIR will qualitatively evaluate the Project's consistency with state and local renewable energy and energy efficiency plans and regulations, including California Code of Regulations (CCR) Title 24, Assembly Bill 2076 (Reducing Dependence on Petroleum), and adopted local energy conservation ordinances and regulations. The EIR will also explain the relationship between the Project and the state's goals for renewable energy, including offshore wind energy.

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VII. Geology, Soils, and Paleontological Resources

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:	☒	☐	☐	☐
1. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
2. Strong seismic ground shaking?	☒	☐	☐	☐
3. Seismic-related ground failure, including liquefaction?	☒	☐	☐	☐
4. Landslides?	☐	☐	☒	☐
b. Result in substantial soil erosion or the loss of topsoil?	☒	☐	☐	☐
c. Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project and potentially result in an onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?	☒	☐	☐	☐
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	☐	☒
e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒
f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☒	☐	☐	☐

Affected Environment

Information in this section is based in part on the first two Geotechnical Data Reports for the Project (SHN 2022, 2023), as well as a variety of other geotechnical investigations throughout the Samoa Peninsula area. In addition to the information provided in this section, the following subjects are related to geology and soils, but are considered in other sections of this IS:

- Potential impacts to water quality due to erosion, runoff, or alteration of drainage patterns are evaluated in Section X (Hydrology and Water Quality)
- Potential impacts related to tsunami inundation are also evaluated in Section X (Hydrology and Water Quality)

The Project Site is located on the Samoa Peninsula, a narrow peninsula that separates Humboldt Bay from the Pacific Ocean (Figure 1). Where undisturbed, the Samoa Peninsula is a dune-covered surface; subsurface investigation in upland areas of the Peninsula in the site vicinity indicate 15 to 20 feet of loose, modern dune sand overlying older (Holocene and Pleistocene age) sediments. The subject site, however, has a long industrial history of timber production that has resulted in significant grading, infilling, and expansion over previous intertidal lands along the Humboldt Bay shoreline. Figure D shows an 1894 Humboldt Bay survey and depicts the historic encroachment over pre-existing intertidal lands. Figure E is a late 1950s- or early 1960s-era aerial photograph of industrial development on the Samoa Peninsula (SHN 2022).

Geology

Regional and Local Geology

Northwestern California is located in a complex tectonic region dominated by northeast-southwest-oriented compression associated with collision of the Gorda and North American tectonic plates. The Gorda plate is being actively subducted beneath North America north of Cape Mendocino, along the southern part of what is commonly referred to as the Cascadia Subduction Zone. This plate convergence has resulted in a broad fold and thrust belt along the western edge of the accretionary margin of the North American plate. In the Humboldt Bay region, this fold and thrust belt is manifested as a series of northwest-trending, southeast-dipping thrust faults, including the Little Salmon fault and faults that comprise the Mad River fault zone. These faults are active and are capable of generating large-magnitude earthquakes.

Basement rock in the Humboldt Bay region (that is, the regional Franciscan Formation) is unconformably overlain by a late Miocene to middle Pleistocene age sequence of marine and terrestrial deposits referred to as the Wildcat Group. The Wildcat Group, in turn, is truncated at its top by an unconformity of middle Pleistocene age, and is overlain by coastal plain and fluvial deposits of middle to late Pleistocene age. In the Eureka area, these middle and late Pleistocene age deposits are referred to as the Hookton Formation, and may be as much as 400 feet thick. Hookton Formation sediments are widely variable in texture and consistency, and are described as gravel, sand, silt, and clay.

Along the coast of northern California between Cape Mendocino to the south and Big Lagoon, about 60 miles to the north, a sequence of uplifted late Pleistocene age marine terraces is preserved. The City of Eureka, across Humboldt Bay from the Samoa Peninsula, occupies a series of northward-dipping terrace surfaces eroded into the Hookton Formation. Along the margins of Humboldt Bay, the Hookton Formation and marine terrace deposits are overlain by late Holocene age (younger than about 5-6,000 years old) bay muds and associated estuarine deposits, as well as local accumulations of dune deposits.

The Project site is located along the Samoa Peninsula, the northern peninsula forming the oceanward side of Humboldt Bay. The location and morphology of Humboldt Bay is largely a result of tectonic processes. Humboldt Bay consists of two principal basins, Arcata Bay and South Bay.

These shallow estuarine basins are connected across the bay mouth by the narrow "Eureka Channel." Each of the principal basins is associated with a tectonic syncline (that is, a crustal down-warp), and appears to represent a filled paleo-river valley. This is especially true in the northern basin, Arcata Bay, which appears to be an erosional feature associated with a former course of the Mad River. In that regard, much of the Samoa Peninsula is the remnant of the western divide of the Mad River drainage, and is underlain by the same earth materials that underlie the Eureka side of the bay.

The entire North Spit is underlain by late Pleistocene to Holocene age marine shoreline and eolian deposits that reflect late Pleistocene changes in sea level related to global glacial cycles. During the most recent glacial period, sea level was considerably lower and the shoreline was far to the west of its current location. Through the latest Pleistocene and early Holocene, as glaciers receded, sea level rose to its current level (reaching the current high stand by about 6,000 years before present). At the Project site, some of the subsurface materials pre-date this period; some however post-date the low sea level stand and are associated with the marine transgression and the in-filling of Humboldt Bay. These depositional intervals are separated in the subsurface by an "unconformity", (an erosional interval) that we interpret as reflecting the most recent (late Pleistocene) low sea level stand.

The deposits below the unconformity, the Hookton Formation and overlying "lower bay mud", would have pre-dated the sea level low stand, while the deposits above the unconformity are interpreted to be latest Pleistocene to Holocene in age and reflect the transgression of sea level to its current levels (which were reached about 6,000 years ago) and the in-filling of Humboldt Bay. The upper (post-unconformity stratigraphy) includes a significant buried "bay mud" interval ("upper bay mud") that suggests Humboldt Bay extended onto the site at one point, and a capping veneer of clean (wind-blown) sand. The buried "upper bay mud" is a localized deposit that does not extend to the south of the site (it has been observed to the northwest), but it exceeds 35 feet in thickness in parts of the site. The veneer of dune sand is ubiquitous across the Samoa Peninsula.

Sedimentary materials beneath the site become increasingly dense with increased depth and geologic age. The upper, Holocene veneer of dune sand is generally loose; where saturated, these materials are typically associated with a high liquefaction potential. The "upper bay mud" is a very soft silty, clayey mud whose material properties are generally analogous to modern bay muds; these sediments are highly compressible and subject to high settlement potential. Hookton Formation sediments that underlie the site below an elevation of minus 60 to 70 feet are associated with a significant increase in material consistency, becoming dense to very dense.

Groundwater is present at relatively shallow depth through the entire Project area. Subsurface investigations have encountered groundwater typically within about 10 feet of sea level. Therefore, in low elevation areas at the site, groundwater is expected to occur within the upper 5 to 10 feet of the ground surface. Groundwater appears to occur most frequently within the loose dune sands in the upper 15 feet, and most boring logs note heaving sands at this stratigraphic interval (deeper drilling only occurs with drilling muds added to the borehole).

Fault Rupture

Seismicity and Faulting

The Project Site is in proximity to numerous latest Quaternary faults located in both the onshore and offshore areas. The Humboldt County coast in general is a highly active tectonic region that has been

subjected to frequent earthquakes of low to moderate strength and rare very strong earthquakes. Seismicity in the region is attributed primarily to the interaction between the Pacific, Gorda, and North American plates. The convergence of the Gorda and North American plates defines the southern end of the Cascadia Subduction Zone (CSZ). The area lies just north of the northern end of the San Andreas fault.

Several different primary earthquake sources have been identified from the interaction of these plates including:

1. an interplate convergence zone (specifically, the CSZ),
2. internal deformation of the subducting Gorda plate,
3. deformation within the overriding North American plate, and
4. interplate transform boundaries consisting of the Mendocino fault zone and San Andreas fault.

Historical earthquakes have been correlated mainly with deformation within the Gorda Plate and along interplate transform boundaries. A brief description of each zone and the relative hazard posed by earthquakes generated from these sources are provided below.

Cascadia Subduction Zone

The leading edge of the CSZ is as close as 35 miles offshore of the Humboldt Bay region. The CSZ is a regional-scale thrust fault (megathrust) that forms the plate boundary between the subducting Gorda plate and Juan de Fuca plate to the north, and the overriding North America plate in the offshore areas of the Pacific Northwest. The subduction zone extends a length of 750 miles from offshore northern California to southern British Columbia. Although there is Native American oral history, there have been no written historical records of CSZ earthquakes. However, geologic evidence from the Humboldt Bay region and elsewhere along the Pacific Northwest coast (such as, drowned coastal forests, buried tidal marshes, and tsunami wave deposits) indicate that great subduction zone earthquakes have repeatedly occurred in the past. A great subduction earthquake along the CSZ would generate long duration, very strong ground shaking followed by the high likelihood of tsunami inundation at the Project Site. (GHD 2021)

Gorda Plate Earthquakes

Earthquakes generated within the Gorda Plate are caused by the deformation and breakup of the subducting plate in the offshore areas and beneath the leading edge of the North American plate. Gorda plate earthquakes account for most of the historical seismicity in the region. A recent strong intra-slab, 6.8 moment magnitude (MW), strike-slip event occurred less than 50 miles offshore of Eureka in March 2014 and produced moderate ground shaking along the Humboldt County coast. One of the largest recent intraslab events was the MW 7.2 oblique-slip event, which occurred less than 7 miles offshore of Trinidad in November 1980. Damage to infrastructure that occurred because of this earthquake included the partial collapse of a U.S. Highway 101 overpass south of Eureka. (GHD 2021)

Earthquakes Within the Over-riding North American Plate

Shallow, crustal earthquakes are those that occur in the overriding North American plate generated from surface or near-surface (blind) thrust faults. These fault zones are comprised of multiple northwest-striking and northeast-dipping low-angle reverse faults located in both the onshore and offshore areas between southern Humboldt Bay and Big Lagoon to the north. These fault zones are

part of a broad fold and thrust belt actively deforming the accretionary wedge in both the offshore and onshore areas of north coastal California, and offshore the Oregon and Washington coast. These thrust faults and their associated hanging wall anticlinal folds are the result of active east-northeast directed compression produced by the convergence of the Gorda and Juan de Fuca plates with the North American plate along the CSZ.

The Little Salmon and Mad River fault zones are the two main thrust fault zones in the Humboldt Bay region and straddle the Project Site to the south and north, respectively. The Little Salmon fault is the nearest Holocene active fault to the Project site and projects offshore in proximity to the Humboldt Bay harbor entrance, approximately 3.5 miles to the south of the site. The Project Site lies in the hanging wall of the fault and overlies the rupture plane, which presumably is as shallow as 2 miles beneath the site, assuming a fault dip of 30 degrees. Paleoseismic evidence suggests that coseismic displacement on the Little Salmon fault is related to great megathrust earthquakes on the subduction zone. Radiocarbon dating suggests earthquakes have occurred on the Little Salmon fault about 300, 800, and 1,600 years ago. Based on published fault parameters, the maximum moment magnitude earthquake for the Little Salmon fault is reported to be between MW 7 and MW 7.3. Displacement on the Little Salmon fault would subject the Project Site to very strong ground shaking due to the proximity of the fault rupture plane beneath the area.

Transform Boundary Earthquakes

Other significant seismic sources capable of generating strong ground motion at the Project site include the Mendocino fault zone and the northern San Andreas fault. The Mendocino fault zone is an east-west trending right lateral strike-slip fault that represents the plate boundary between the Pacific plate and southern edge of the Gorda plate. The Mendocino fault zone is the second-most frequent source of earthquakes in the region. Historical earthquakes have ranged in magnitude from MW 5 to MW 7.5. The northern San Andreas fault is a right-lateral strike-slip fault that represents the plate boundary between the Pacific and North American plates. The fault traverses Point Delgada at Shelter Cove and terminates at the Mendocino triple junction. The 1906 San Francisco earthquake (MW 8.3) ruptured the ground surface at Shelter Cove and caused the most significant damage in the north coast region, with the possible exception of the 1992 Petrolia earthquake.

Surface Fault Rupture

Surface fault rupture describes displacement of the ground surface along a fault during an earthquake. Depending on the type of fault, this displacement may be horizontal, vertical, or both. Damage from fault rupture can be severe depending on the size of the displacement but is limited to the relatively narrow area along the fault where it daylights at the ground surface. Surface fault rupture may occur as a discrete rupture trace or a broad zone of distributed shearing. Not all earthquakes result in fault rupture that reaches the ground surface; the larger the earthquake, the more likely it is to generate surface fault rupture.

The surface trace of the Little Salmon fault is projected to be 3.5 miles south of the Project Site and is the nearest Holocene age fault designated by the State of California as being active. The Project Site is not located within an Alquist-Priolo Fault Hazard Zone associated with this or any other active fault. No known active or recently inactive fault crosses the Project Site, and we found no field evidence to suggest that a previously unrecognized active fault may be present.

The North Spit fault has been identified in geophysical transects offshore of the Peninsula, projecting across the southern end of the North Spit, but it has never been identified on land (either on the Peninsula or in Eureka); it is not considered active by the State.

Seismic Shaking

Ground shaking is the primary cause of damage and injury during earthquakes. Ground-shaking impacts can lead to a variety of secondary seismic effects, including liquefaction, lateral spreading, and landslides. Ground shaking levels are typically a result of the size of the earthquake generating the shaking and the proximity to the fault source. Seismic shaking is influenced by the geology at a site; thick accumulations of saturated, unconsolidated sediments tend to amplify long wavelength seismic waves, while hard bedrock tends to amplify short wavelength seismic waves.

The Modified Mercalli Intensity Scale for Earthquakes, shown below13, describes ground-shaking intensity in terms of human perception and damage to the built environment, and takes into account localized earthquake effects.

Modified Mercalli Intensity Level

I. Not felt except by a very few under especially favorable conditions.

II. Felt only by a few persons at rest, especially on upper floors of buildings.

III. Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.

IV. Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.

V. Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.

VI. Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.

VII. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.

VIII. Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.

IX. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.

X. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

XI. Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.

XII. Damage total. Lines of sight and level are distorted. Objects thrown into the air.

Numerous faults in the Humboldt Bay region, including faults in the Gorda and North American plates, the Mendocino and San Andreas fault systems, and the Cascadia Subduction Zone, could result in strong seismic shaking in the Project area (ICF 2022).

As shown on a map published by CGS (2003), the relative intensity of earthquake-induced ground shaking and damage in the Proposed Project area from anticipated future earthquakes is at the highest end of the possible range. Specifically, the relative intensity of earthquake-induced ground shaking for future anticipated earthquakes, calculated as the level of ground motion that has a 2 percent chance of being exceeded in 50 years, is high to very high in the Proposed Project area (ICF 2022).

Historic large earthquakes in the north coast region (1906 San Francisco earthquake, 1954 earthquake) have resulted in Modified Mercalli intensities of VIII or greater with significant regional damage.

Liquefaction and Landsliding

Liquefaction is a process whereby strong ground shaking, such as that from seismic activity, causes saturated soils and sediments to temporarily lose strength and to behave as a viscous fluid. Soil materials that are particularly prone to liquefaction are those that are unconsolidated, silty, or sandy and existing within 50 feet of the ground surface and saturated by groundwater. Liquefaction can cause excessive ground deformations, failures, and temporary loss of soil bearing capacity, resulting in damage to structures and levees. Ground failures can take the forms of lateral spreading, excessive differential or total compaction or settlement, and slope failure (ICF 2022).

The relative slope stability and liquefaction potential in the Project area have been mapped by the County of Humboldt (2016). The mapping shows that the Project area are mapped as “Relatively Stable” with respect to slope stability (e.g., landsliding). The “Relatively Stable” category is the most stable of the four categories used on the map (ICF 2022).

The Project area is in an “Area of Potential Liquefaction.” The Redwood Marine Terminal II sediment processing site is not subject to liquefaction (ICF 2022).

Liquefaction

Liquefaction is described as the sudden loss of soil shear strength due to a rapid increase of soil pore water pressures caused by cyclic loading from a seismic event. In simple terms, it means that a liquefied soil acts more like a fluid than a solid when shaken during an earthquake. In order for liquefaction to occur, the following are needed:

- granular soils (sand, silty sand, sandy silt, and some gravels),
- a high groundwater table, and
- a low density of the granular soils (typically associated with young geologic age).

The adverse effects of liquefaction include local and regional ground settlement, ground cracking and expulsion of water and sand, the partial or complete loss of bearing and confining forces used to support loads, amplification of seismic shaking, and lateral spreading. During liquefaction events, pipelines tend to become buoyant due to the loss of confining pressure and “float” toward the ground surface. (Humboldt County 2019).

Lateral spreading is defined as lateral earth movement of liquefied soils, or competent strata riding on a liquefied soil layer, downslope toward an unsupported slope face, such as a creek bank, or in this case toward the bay. In general, lateral spreading is typically observed on low to moderate gradient slopes but has been noted on slopes inclined as flat as one degree.

Seismically-induced ground failures have been documented on two occasions in the project vicinity following historical moderate to large magnitude earthquakes. Specific accounts of historical ground failures include the following account from the 1906 earthquake:

> At Samoa…where the Vance Company has its mill and warehouses. At one warehouse, the ground sunk beneath it several feet. The floor of the planing mill sank several inches on the east side and some are of the opinion that the factories settled also at one wall (Youd and Hoose, 1978).

Historical photographs indicate that the Vance Company mill complex was located along the bayfront, and likely was founded on unengineered, "reclaimed" bay soils. It is, therefore, not surprising that ground deformation occurred during the 1906 earthquake, as similar events were documented in reclaimed soils along the bayfront elsewhere.

In 1954, the following account is recorded:

> Hammond Lumber Company brought its operations to a sudden halt when several breaks occurred in the underground main of the company's fire protection system. A.O. LeFors, spokesperson for Hammond, stated that the mill will not operate in Samoa or at its Eureka plants until repairs have been made (Youd and Hoose, 1978).

Humboldt County GIS Hazard maps identify the area as being potentially susceptible to liquefaction hazards (Humboldt County 2018). Subsurface investigations at the site have encountered young and unconsolidated clean sands and loose- to medium-dense sands extending to depths of about 15 to 30 feet. The lower part of this section of loose Holocene age sand is typically below the water table, which may rise seasonally to within a few feet of the ground surface. When saturated, such soils are predisposed to liquefaction and other related soil behavior.

Landslides

As the Samoa Peninsula within the project area is a low-relief area absent of significant sloping ground, there are no known landslide hazards shown on available published geologic hazard maps.

Soils

Surface soils (i.e., the upper 5–6 feet) in western Humboldt County have been mapped by the United States Department of Agriculture (USDA) Natural Resources Conservation Service as underlain by a number of soil map units. The map units generally consist of clayey to coarse-loamy soils on low floodplains, tidal flats, and tidal marshes. Some of the soils consist of coarse-loamy dredge spoils and other fill materials. Many of the soils have a shallow water table or are subject to frequent flooding. The soils are mainly mineral (i.e., low organic matter content) soils, but some of the map units contain high organic matter content (i.e., mucky) mineral soils. The soils generally are moderately well drained to very poorly drained (ICF 2022).

Because the slopes are level to very gentle, the hazard of water erosion is slight. Some of the soils would be considered expansive, as defined in Table 18-1-B of the Uniform Building Code (ICF 2022).

Soil Erosion

Construction activities, including demolition, grading, soil densification, trenching, and operation of heavy machinery, would disturb soil and, therefore, have the potential to cause erosion. Loose clean sands underlying upland portions of the site are associated with high erosion potential. Vegetation and other erosion control measures are critical (and highly effective) in stabilizing loose sandy soils. State and local regulations require erosion and sediment control provisions prescribed in the Humboldt County Code and the California Building Code (CBC).

Expansive Soils

Expansive soils have not been encountered in subsurface investigation at the site or in the vicinity, and they are not expected in this geologic environment.

Septic Systems

Development on the Samoa Peninsula has historically entailed the use of individual septic systems that discharge to individual leachfields. Most of the existing septic systems are aging and are poorly suited for the soil and groundwater conditions that exist on the peninsula. The North Coast Regional Water Quality Control Board (NCRWQCB) is concerned about the impacts of partially-treated effluent discharged to leachfields, groundwater, and Humboldt Bay due to the Peninsula's high water table and sandy soils.

The Project Site includes existing leach fields managed by the Harbor District. These remain from former industrial use. The Project calls for utilizing the adjacent wastewater treatment facility operated by Peninsula Community Services District (See Section XIX Utilities for additional detail). During demolition activities, leach fields shall be decommissioned and removed pursuant to California Health and Safety Code Section 115700(a) and Humboldt County Code Sections 611-6 and 612-2. Project Site structures would be connected to Peninsula Community Services District (PCSD) sewer lines.

Paleontological Resources

Paleontological resources are the remains or traces of prehistoric animals and plants. Paleontological resources, which include fossil remains and geologic sites with fossil-bearing strata, are non-renewable, scarce, and are a sensitive resource afforded protection under environmental legislation in California. Under California Public Resources Code (PRC) § 5097.5, unauthorized disturbance or removal of a fossil locality or remains on public land is a misdemeanor. State law also requires reasonable mitigation of adverse environmental impacts that result from development of public land and affect paleontological resources (PRC § 30244).

The Project Area occurs within a dynamic coastal setting, such that paleontological resources are rare. In strata that pre-date potential cultural deposition, shell fragments have been observed in subsurface investigations, but no significant fossil remains are known. These materials represent deposition in paleo-estuaries during the late Pleistocene and Holocene, which were common as Humboldt Bay was filling during the most recent post-glacial sea level rise. Shells (mostly fragments) from these materials are common in the area; as such, there are no known unique paleontological resources in the project vicinity. The Project site has been heavily industrialized and ground disturbance has occurred in the entire Project area.

Regulatory Setting

Federal

U.S. Geological Survey National Seismic Hazard Maps

The U. S. Geological Survey (USGS) provides probabilistic seismic hazard maps for the 48 conterminous states. These maps depict contour plots of seismically induced peak ground acceleration (PGA) and spectral accelerations at selected frequencies for various ground-motion return periods. The USGS National Seismic Hazard Maps are updated periodically and have been adopted by many building and highway codes as the minimum design requirements (ICF 2022).

Clean Water Act

The Clean Water Act (CWA) is discussed in detail in the Hydrology and Water Resources section. However, because CWA Section 402 is directly relevant to soil erosion and soil disturbance, additional information is provided here (ICF 2022).

The CWA (33 USC § 1251 et seq.) establishes the institutional structure for the U.S. Environmental Protection Agency (USEPA) to regulate point and nonpoint discharges of pollutants into the waters of the United States, establish water quality standards, and implement pollution control programs. The CWA authorizes USEPA to delegate many permitting, administrative, and enforcement aspects of the law to state governments. In California, the State Water Resources Control Board (State Water Board) has been designated by USEPA to develop and enforce water quality objectives and implementation plans. The State Water Board has delegated the specific responsibilities for the development and enforcement actions to the regional water quality control boards (Regional Water Boards). Humboldt Bay is located within Region 1, the jurisdictional area of the North Coast Regional Water Quality Control Board (North Coast Water Board; ICF 2022).

Section 402: Permits for Discharge to Surface Waters

CWA Section 402 regulates discharges to surface waters through the National Pollutant Discharge Elimination System (NPDES) program, which is administered by the Regional Water Boards (ICF 2022).

Under Section 402, dischargers whose projects would disturb at least 1 acre of soil or whose projects disturb less than 1 acre but are part of a larger common plan of development that in total disturbs 1 or more acres, are required to obtain coverage under the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit) (Order 2009-0009-DWQ as amended by 2010-0014-DWQ and 2012-0006-DWQ). Construction activity subject to this permit includes clearing, grading and other ground disturbances such as soil stockpiling and excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility (ICF 2022).

The Construction General Permit requires the development of a site-specific Storm Water Pollution Prevention Plan (SWPPP) by a Qualified SWPPP Developer (QSD). The SWPPP must identify an effective combination of soil erosion and sediment control measures, as well as non-stormwater best management practices (BMPs). The Construction General Permit requires that the SWPPP define a program of regular inspections of the BMPs and, in some cases, sampling of water quality parameters. The North Coast Water Board administers the NPDES stormwater permit program in Humboldt County. Individual material processing sites and beneficial use project sites potentially

would require coverage under the Construction General Permit and therefore implementation of BMPs to manage stormwater runoff and to control accelerated soil erosion for construction-related activities, depending on the area of ground disturbance and nature of the activity at these locations (ICF 2022).

The SWPPP would describe measures to manage water generated from land-based dewatering activities (e.g., from trenches and other excavations) if such work is required. Disposal of water from land-based dewatering requires coverage under the SWRCB North Coast Region Waste Discharge Requirements (WDR) Program (ICF 2022).

Uniform Building Code

The International Conference of Building Officials published the family of Uniform Codes to provide jurisdictions with a complete set of building-related regulations for adoption. Standard 18-2 provides the Expansion Index Test, and Table 18-1-B includes a classification of expansive soil.

State

Liquefaction and Landslide Hazard Maps (Seismic Hazards Mapping Act)

The Seismic Hazards Mapping Act of 1990 (California PRC §§ 2690–2699.6) was passed following the 1989 Loma Prieta earthquake to reduce threats to public health and safety by identifying and mapping known seismic hazard zones in California. The act directs California Geological Survey (CGS) to identify and map areas prone to earthquake hazards of liquefaction, earthquake-induced landslides, and amplified ground shaking. The purpose of the maps is to assist cities and counties in fulfilling their responsibilities for protecting public health and safety. The Act requires site-specific geotechnical investigations be conducted identifying the seismic hazard and formulating mitigation measures prior to permitting most developments designed for human occupancy within areas prone to liquefaction and earthquake-induced landslides (also known as a Zone of Required Investigation; ICF 2022).

Because the Proposed Project does not entail construction of habitable structures, the Act is not discussed further in this document (ICF 2022).

Alquist-Priolo Earthquake Fault Zones

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. In accordance with this act, the State Geologist established regulatory zones, called “earthquake fault zones,” around the surface traces of active faults and published maps showing these zones. Within these zones, buildings for human occupancy cannot be constructed across the surface trace of active faults. Because many active faults are complex and consist of more than one branch, each earthquake fault zone extends approximately 200 to 500 feet on either side of the mapped fault trace. (Humboldt County 2019)

Title 14 of the California Code of Regulations (CCR), Section 3601(e), defines buildings intended for human occupancy as those that would be inhabited for more than 2,000 hours per year. There are no Alquist-Priolo Earthquake Fault Zones within the Project area (CDC 2018). Therefore, the provisions of the act do not apply to the Project.

Seismic Hazards Mapping Act

Like the Alquist-Priolo Act, the Seismic Hazards Mapping Act of 1990 (PRC Sections 2690 to 2699.6) is intended to reduce damage resulting from earthquakes. While the Alquist-Priolo Act addresses surface fault rupture, the Seismic Hazards Mapping Act addresses other earthquake-related hazards, including strong ground shaking, liquefaction, and seismically induced landslides. Its provisions are similar in concept to those of the Alquist-Priolo Act, where the state is charged with identifying and mapping areas at risk of strong groundshaking, liquefaction, landslides, and other corollary hazards, with cities and counties required to regulate development within mapped Seismic Hazard Zones.

While the Project area is located in a seismically active area subject to strong seismic shaking, liquefaction and seismically induced landslides (all have been observed in the region), to date no Seismic Hazard mapping has been completed by the State anywhere in the north coast region.

California Building Code

The State of California provides minimum standards for building design through the CBC. CBC Chapter 29 regulates excavation, foundations, and retaining walls. The CBC applies to building design and construction in the state and is based on the federal Uniform Building Code (UBC) used widely throughout the country. The CBC has been modified for California conditions with numerous more detailed and/or more stringent regulations. Specific minimum seismic safety and structural design requirements are set forth in CBC Chapter 16. The Code identifies seismic factors that must be considered in structural design. Chapter 18 of the CBC regulates the excavation of foundations and retaining walls, and Appendix Chapter A33 regulates grading activities, including drainage and erosion control, and construction on unstable soils, such as expansive soils and areas subject to liquefaction. Wharf seismic design shall comply with CBC-ASCE 7-16 for wharf structure accessible by general public which include life safety and no collapse requirements under rare ground motion. For wharves structures not accessible to general public, the wharf seismic design shall comply with ASCE-61. ASCE-61 specifies two levels of ground motions: Operating Level Earthquake (OLE) with 72-year return period and Contingency Level Earthquake with 475 return period. The structure performance criteria under each ground motion level depends on the structure's classification. (GHD 2021)

Section 1803.5.11 For structures assigned to Seismic Design Category C, D, E or F, a geotechnical investigation shall be conducted, and shall include an evaluation of all of the following potential geologic and seismic hazards: Slope instability; Liquefaction; Total and differential settlement; and Surface displacement due to faulting or seismically-induced lateral spreading or lateral flow. Section 1803.5.12 for structures assigned to Seismic Design Category D, E or F, the geotechnical investigation required by Section 1803.5.11 shall also include all of the following as applicable: 1) the determination of dynamic seismic lateral earth pressures on foundation walls and retaining walls; 2)the potential for liquefaction and soil strength loss evaluated for site peak ground acceleration; 3) earthquake magnitude and source characteristics consistent with the maximum considered earthquake ground motions; 4) peak ground acceleration; 5) an assessment of potential consequences of liquefaction and soil strength loss including, differential settlement; 6) lateral soil movement; 7) lateral soil loads on foundations; 8) soil downdrag and reduction in axial and lateral soil reaction for pile foundations; 9) increases in soil lateral pressures on retaining walls; and 10) flotation of buried structures.

California Coastal Act

Sections 30253(a) and (b) of the Coastal Act require minimization of risks in areas of high geologic and flood hazards.

Regional and Local

Humboldt Bay Area Plan of the Local Coastal Program

For the Project site, the relevant local hazard mitigation plan relative to geohazards appears in the Humboldt Bay Area Plan (HBAP) of the Humboldt County Local Coastal Program (Humboldt County 2022). As stated within the HBAP, sections marked *** contain relevant Coastal Act policies that have also been enacted as County policy. The pertinent section follows:

Section 3.17 (Hazards) states in part:

*** 30253. New Development shall:

1. Minimize risks to life and property in areas of high geologic, flood and fire hazard.
2. Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding areas or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs.

The hazard policies apply to all new development within the planning area. For the most part, these policies have been extracted from Humboldt County's adopted Seismic Safety Element. New development shall be consistent with the adopted Humboldt County Safety and Seismic Safety element of the General Plan. Chapter 70, Section 7006, of the Uniform Building Code requires soil engineering and geological engineering investigations, prepared by a registered geologist or by a professional civil engineer with experience in soil mechanics or foundation engineering, or by a certified engineering geologist, for classes of development and hazard areas (Humboldt County 2019)

The report should evaluate the off-site impacts of development (e.g. development contributing to geological instability on access roads) and the additional impacts that might occur due to the proposed development (e.g. increased soil moisture from a septic system). The report should also detail mitigation measures for any potential impacts and should outline alternative solutions. The report should express a professional opinion as to whether the project can be designed so that it will neither be subject to nor contribute to significant geologic instability throughout the lifespan of the project. The report should use a currently acceptable engineering stability analysis method and should also describe the degree of uncertainty of analytical results due to assumptions and unknowns. The degree of analysis required should be appropriate to the degree of potential risk presented by the site and the proposed project. The developments permitted in the hazard areas shall be sited and designed to assure stability and structural integrity for their expected economic life spans while minimizing alteration of natural landforms. Bluff and cliff developments (including related storm runoff, foot traffic, site preparation, construction activity, irrigation, waste water disposal, and other activities and facilities accompanying such development) shall not create or contribute significantly to problems of erosion or geologic instability on the site or on surrounding geologically hazardous areas. (Humboldt County 2019)

Humboldt County Geologic Hazards Ordinance

Humboldt County Code Section 336 regulations apply to those projects and activities which fall within the County's land use and development jurisdiction. The purpose of these regulations is to ensure that risks to life and property in moderate and high geologic hazard areas are minimized and further to assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of development sites or surrounding areas. (GHD 2021)

Humboldt County Grading Excavation, Erosion and Sedimentation Control Ordinance

Humboldt County Code Section 331-14 regulates grading activities exceeding 50 cubic yards.

State and local regulations require erosion and sediment control provisions prescribed in the Humboldt County Code and the CBC. A construction SWPPP is required to be prepared for the Project, (See Section 3.11 Hydrology and Water Quality).

Expansive Soils

The International Conference of Building Officials published the family of Uniform Codes to provide jurisdictions with a complete set of building-related regulations for adoption. Standard 18-2 provides the Expansion Index Test, and Table 18-1-B includes a classification of expansive soil. Chapter 18 of the CBC regulates the excavation of foundations and retaining walls, and Appendix Chapter A33 regulates grading activities, including drainage and erosion control, and construction on unstable soils, such as expansive soils.

County of Humboldt Section 331-12 Grading, Excavation, Erosion, and Sedimentation Control Ordinance

The purpose of this ordinance is to safeguard life, limb, property, and the public welfare, including the protection of water resources and their related habitats by regulating grading and related activities on private and public property, to control and reduce erosion, to reduce sediment delivered to drainages and streams, and to protect fishery habitat and other biological resources by providing best erosion control and sediment management practices (County of Humboldt n.d.; ICF 2022).

Processing of dredged sediments and application of fill material at the sediment processing sites and beneficial reuse sites, respectively, may require compliance with the ordinance (ICF 2022).

County of Humboldt Division 3, Building Regulations, Chapter 6 – Geologic Hazards

The purpose of this ordinance is to ensure that risks to life and property in moderate to high geologic hazard areas are minimized, to ensure the stability and integrity of structures, and to avoid creation of or significantly increase erosion and geologic instability. The ordinance applies to projects and activities that fall within the County's land use and development jurisdiction (County of Humboldt 2002; ICF 2022).

However, the dredging, sediment transport, handling, and beneficial use activities of the Proposed Project are not included among the types of projects or activities listed in the "Geologic Hazards Land Use Matrix" contained in the ordinance; therefore, this regulation is not applicable to the Proposed Project (ICF 2022).

Discussion

a.1. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

There is the potential for impacts related to geologic hazards at the Project site. However, there are no AP Special Study zones at or near the site, as depicted on the most recent Alquist-Priolo Earthquake Fault Zoning Map,.

a.2. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: Strong seismic ground shaking?

The Project Site is subject to seismic ground shaking, as is all of Humboldt County. Construction aspects of the Project will be required to meet regulatory standards and build elements to withstand seismic ground shaking. It is unknown at this time what the operational details are, including standards, to keep structures and assembled WTG units from toppling during seismic events. Details would need to be sufficient to evaluate impacts related to partially and fully integrated WTGs on both land and in wet storage.

a.3. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: Seismic-related ground failure, including liquefaction?

The Project Site is subject to seismic-related ground failure, Construction aspects of the Project will be required to meet regulatory standards and build elements to withstand seismic-related ground failure. It is unknown at this time what the operational details are, including standards, to keep structures and assembled WTG units from toppling during seismic-related ground failure. Details would need to be sufficient to evaluate impacts related to partially and fully integrated WTGs on both land and in wet storage.

a.4. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: Landslides?

The site is flat and not subject to geologic hazards related to landslides. While substantial fill will be brought onto the site to provide for the heavy lift requirements and accommodate future sea level rise concerns, edge slopes will be provided that reduce risk of failure or erosion.

b. Result in substantial soil erosion or the loss of topsoil?

The site is flat and not subject to geologic hazards related to landslides. While substantial fill will be brought onto the site during the construction phase to provide for the heavy lift requirements and accommodate future sea level rise concerns, edge slopes will be provided that reduce risk of failure or erosion. Operational aspects of the Project are not expected to result in substantial soil erosion or the loss of topsoil.

c. Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project and potentially result in an onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?

There is the potential for impacts related to geologic hazards at the Project site. The Project Site is subject to seismic-related ground failure, construction aspects of the Project will be required to meet regulatory standards and build elements to withstand seismic-related ground failure. It is unknown at this time what the operational details are, including standards, to keep structures and assembled WTG units from toppling during ground shaking or failure. Details would need to be sufficient to evaluate impacts related to partially and fully integrated WTGs on land.

d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?

Expansive soils have not been encountered in subsurface investigation at the site or in the vicinity, and they are not expected in this geologic environment.

e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater?

No onsite wastewater disposal systems are proposed. The Project will be hooked up to an existing wastewater treatment system.

f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

The Project Area is a very dynamic coastal setting, and there are no known unique paleontological or geologic resources in the vicinity. Near surface habitats range from bay muds to the east to remnant sand dune material on the terrestrial portion of the Project site. The Project site has been heavily industrialized and ground disturbance has occurred in the entire Project area.

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VIII. Greenhouse Gas Emissions

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:					
a.	Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☒	☐	☐	☐
b.	Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☒	☐	☐	☐

Affected Environment

Global Climate Change

The process known as the *greenhouse effect* keeps the atmosphere near Earth's surface warm enough for the successful habitation of humans and other life forms. The greenhouse effect is created by sunlight that passes through the atmosphere. Some of the sunlight striking Earth is absorbed and converted to heat, which warms the surface. The surface emits a portion of this heat as infrared radiation, some of which is re-emitted toward the surface by GHGs. Human activities that generate GHGs increase the amount of infrared radiation absorbed by the atmosphere, thus enhancing the greenhouse effect and amplifying the warming of Earth.

Increases in fossil fuel combustion and deforestation have exponentially increased concentrations of GHGs in the atmosphere since the Industrial Revolution (Intergovernmental Panel on Climate Change 2023). Rising atmospheric concentrations of GHGs in excess of natural levels result in increasing global surface temperatures— a process commonly referred to as *global warming*. Higher global surface temperatures, in turn, result in changes to Earth's climate system, including increased ocean temperature and acidity, reduced sea ice, variable precipitation, and increased frequency and intensity of extreme weather events (Intergovernmental Panel on Climate Change 2023). Large-scale changes to Earth's system are collectively referred to as *climate change.*

The Intergovernmental Panel on Climate Change (IPCC) was established by the World Meteorological Organization and United Nations Environment Programme to assess scientific, technical, and socioeconomic information relevant to the understanding of climate change, its potential impacts, and options for adaptation and mitigation. The IPCC estimates that human-induced warming reached approximately 1 degree Celsius (°C) above pre-industrial levels in 2017, increasing at 0.2°C per decade. Under the current nationally determined contributions of mitigation from each country until 2030, global warming is expected to rise to 3°C by 2100, with warming to continue afterwards (Intergovernmental Panel on Climate Change 2018). Large increases in global temperatures could have substantial adverse effects on the natural and human environments worldwide and in California.

Greenhouse Gases

The principle anthropogenic (human-made) GHGs contributing to global warming are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated compounds, including sulfur hexafluoride, hydrofluorocarbons, and perfluorocarbons. Water vapor, the most abundant GHG, is not included in this list because its natural concentrations and fluctuations far outweigh its anthropogenic sources.

The primary GHGs of concern associated with the Proposed Project are CO_2, CH_4, and N_2O. Principal characteristics of these pollutants are discussed below.

- **Carbon dioxide** enters the atmosphere through fossil fuels (oil, natural gas, and coal) combustion, solid waste decomposition, plant and animal respiration, and chemical reactions (e.g., manufacture of cement). CO_2 is also removed from the atmosphere (or *sequestered*) when it is absorbed by plants as part of the biological carbon cycle.
- **Methane** is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and from the decay of organic waste in municipal solid waste landfills.
- **Nitrous oxide** is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.

Methods have been set forth to describe emissions of GHGs in terms of a single gas to simplify reporting and analysis. The most commonly accepted method to compare GHG emissions is the global warming potential (GWP) methodology defined in IPCC reference documents. IPCC defines the GWP of various GHG emissions on a normalized scale that recasts all GHG emissions in terms of carbon dioxide equivalent (CO_2e), which compares the gas in question to that of the same mass of CO_2 (CO_2 has a global warming potential of 1 by definition).

Table M lists the global warming potential of CO_2, CH_4, and N_2O; their lifetimes; and their abundance in the atmosphere.

Table M. Lifetimes and Global Warming Potentials of Key Greenhouse Gases

Greenhouse Gases	Global Warming Potential (100 years)	Lifetime (years)
CO_2	1	--[a]
CH_4	25	12
N_2O	298	114

Source: California Air Resources Board 2019.
CH_4 = methane; CO_2 = carbon dioxide; N_2O = nitrous oxide
[a] CARB has not identified a lifetime for CO_2.

All GWPs used for CARB's GHG inventory and to assess attainment of the state's 2020 and 2030 reduction targets are considered over a 100-year timeframe (as shown in Table M). However, CARB recognizes the importance of short-lived climate pollutants (SLCP) and reducing these emissions to achieve the state's overall climate change goals. SLCPs have atmospheric lifetimes on the order of a few days to a few decades, and their relative climate forcing impacts, when measured in terms of how they heat the atmosphere, can be tens, hundreds, or even thousands of times greater than that of CO_2 (California Air Resources Board 2017).

Recognizing their short-term lifespan and warming impact, SLCPs are measured in terms of CO_2e using a 20-year time period. The use of GWPs with a time horizon of 20 years better captures the importance of the SLCPs and gives a better perspective on the speed at which SLCP emission controls would impact the atmosphere relative to CO_2 emission controls. The SLCP Reduction Strategy addresses the three primary SLCPs: CH_4, hydrofluorocarbon gases, and anthropogenic black carbon. Methane has lifetime of 12 years and a 20-year GWP of 72. Hydrofluorocarbon gases, which would not be generated by the Proposed Project , have lifetimes of 1.4 to 52 years and a 20-year GWP of 437 to 6,350. Anthropogenic black carbon has a lifetime of a few days to weeks and a 20-year GWP of 3,200 (California Air Resources Board 2017).

Greenhouse Gas Reporting

A GHG inventory is a quantification of all GHG emissions and sinks[4] within a selected physical and/or economic boundary. GHG inventories can be performed on a large scale (e.g., for global and national entities) or on a small scale (e.g., for a building or person). Although many processes are difficult to evaluate, several agencies have developed tools to quantify emissions from certain sources. Table N outlines the most recent global, national, statewide, and county GHG inventories to help contextualize the magnitude of potential Proposed Project -related emissions. There is no GHG inventory specifically for the Proposed Project area. Mobile sources (e.g., vehicle trips) generate the largest amounts of GHG emissions in the Proposed Project area. Other smaller sources of GHG emissions in the Proposed Project area include dredging, material processing, and sediment transport.

Table N. Global, National, State, and Local Greenhouse Gas Emissions (metric tons per year)

Emissions Inventory	CO_2e (rounded)
2020 IPCC Global	54,000,000,000
2021 USEPA National	5,586,000,000
2020 CARB State	369,200,000
2015 Humboldt County	1,533,161

Sources: Intergovernmental Panel on Climate Change 2022; U.S. Environmental Protection Agency 2023; California Air Resources Board 2022a; Humboldt County 2023.

CARB = California Air Resources Board; CO_2e = carbon dioxide equivalent; EPA = U.S. Environmental Protection Agency; GHG = greenhouse gas; IPCC = Intergovernmental Panel on Climate Change.

Potential Climate Change Effects

Climate change is a complex process that has the potential to alter local climatic patterns and meteorology. Although modeling indicates that climate change would result in sea level rise (both globally and regionally) as well as changes in climate and rainfall, among other effects, there remains uncertainty about characterizing precise local climate characteristics and predicting precisely how various ecological and social systems would react to any changes in the existing climate at the local level. Regardless of this uncertainty, it is widely understood that substantial climate change is expected to occur in the future, although the precise extent would take further research to define. Specifically, significant impacts from global climate change worldwide and in California include the following.

[4] A *GHG sink* is a process, activity, or mechanism that removes a GHG from the atmosphere.

- Declining sea ice and mountain snowpack levels, thereby increasing sea levels and sea surface evaporation rates with a corresponding increase in atmospheric water vapor, due to the atmosphere's ability to hold more water vapor at higher temperatures (California Natural Resources Agency 2018).
- Rising average global sea levels primarily due to thermal expansion and the melting of glaciers, ice caps, and the Greenland and Antarctic ice sheets (Intergovernmental Panel on Climate Change 2018).
- Changing weather patterns, including changes to precipitation, ocean salinity, and wind patterns, and more energetic aspects of extreme weather including droughts, heavy precipitation, heat waves, extreme cold, and the intensity of tropical cyclones (Intergovernmental Panel on Climate Change 2018).
- Declining Sierra Mountains snowpack levels, which account for approximately half of the surface water storage in California, by 70% to as much as 90% over the next 100 years (California Natural Resources Agency 2018).
- Increasing the number of days conducive to ozone formation (e.g., clear days with intense sun light) by 25% to 85% (depending on the future temperature scenario) by the end of the twenty-first century in high ozone areas, including Southern California (California Natural Resources Agency 2018).
- Increasing the potential for erosion of California's coastlines and seawater intrusion into the Sacramento Delta and associated levee systems due to the rise in sea level (California Natural Resources Agency 2018).
- Exacerbating the severity of drought conditions in California such that durations and intensities are amplified, ultimately increasing the risk of wildfires and consequential damage incurred (California Natural Resources Agency 2018).
- Under changing climate conditions, agriculture is projected to experience lower crop yields due to extreme heat waves, heat stress and increased water needs of crops and livestock (particularly during dry and warm years), and new and changing pest and disease threats (California Natural Resources Agency 2018).
- The impacts of climate change, such as increased heat-related events, droughts, and wildfires, pose direct and indirect risks to public health, as people would experience earlier death and worsening illnesses. Indirect impacts on public health include increased vector-borne diseases, stress and mental trauma due to extreme events and disasters, economic disruptions, and residential displacement (California Natural Resources Agency 2018).

Discussion

a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

The EIR will quantitatively analyze GHGs emitted by Project construction and operation, and assess the overall impact of the proposed Project related to GHGs on the environment.

b. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

ICF will qualitatively evaluate the project's consistency with state and local air quality and climate change plans and regulations, including the PM10 Attainment Plan, County's CAP, Senate Bill (SB) 32, Executive Order B-55-18, and the 2022 Scoping Plan. Because the CAP has not yet been adopted and the state regulatory environment for GHG emissions is frequently evolving, the significant threshold(s) for evaluating GHG impacts for the project will be finalized at the time of analysis preparation. The ultimate threshold(s) will be selected in close coordination with the District and consider all applicable case law and air district and expert agency guidance.

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IX. Hazards and Hazardous Materials

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:					
a.	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☒	☐	☐	☐
b.	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☒	☐	☐	☐
c.	Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☒	☐	☐	☐
d.	Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☒	☐	☐	☐
e.	Be located within an airport land use plan area or, where such a plan has not been adopted, be within two miles of a public airport or public use airport, and result in a safety hazard or excessive noise for people residing or working in the project area?	☒	☐	☐	☐
f.	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☒	☐	☐	☐
g.	Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?	☒	☐	☐	☐

Affected Environment

Hazardous Materials

The Project Site is located on the Samoa Peninsula, a narrow peninsula that separates Humboldt Bay from the Pacific Ocean (Figure 1). The subject site has a long industrial history of timber production that began in 1892 with construction of the mill and connection to rail lines in 1893. In 1917, a shipyard was built for construction of wooden steam ships. Timber related industries associated with the site included a sawmill, cutting and planer mill, door and sash factory, and cogeneration power plant. The majority of the study area has been previously developed with paved surfaces, foundations, drainageways, and compacted soils that remain following demolitions of structures and

industrial facilities. Current operations at the project site consist of a log storage yard, commercial fishing operations, and recreational boat repair (SHN 2022a).

Land use within the study area consists of current and previous industrial uses as well as Humboldt Bay. Surrounding Humboldt Bay is a variety of industrial, commercial, public, natural resource, agricultural and residential uses. Historic industrial, commercial and agricultural land uses have a higher likelihood of contributing to hazardous materials impacts. Residential and commercial uses are less likely but contribute to stormwater discharge into the Bay.

Hazardous materials are a wide-ranging category of substances that include toxic substances, flammable or explosive materials, corrosive substances such as acids, and radioactive substances. A material is considered hazardous if it appears on a list of hazardous materials prepared by a federal, state, or local agency, or if it has characteristics defined as hazardous by such an agency. Facts that influence the health effects of exposure to hazardous material include the dose to which the person is exposed, the frequency of the exposure, the exposure pathway, and individual susceptibility. (Humboldt County 2019)

The California Code of Regulations (CCR) defines a hazardous material as a substance that, because of physical or chemical properties, quantity, concentration, or other characteristics, may either: (1) cause an increase in mortality or an increase in serious, irreversible, or incapacitating illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of, or otherwise managed (CCR, Title 22, Division 4.5, Chapter 10, Article 2, Section 66260.10). Hazardous wastes refer to hazardous materials that are no longer used and have been disposed of or are awaiting disposal. (Humboldt County 2019)

Emergencies involving hazardous materials often occur due to mechanical failure or human error. These types of emergencies also sometimes occur as a secondary impact of another emergency, such as an earthquake or flood. Hazardous material releases can occur from buildings such as factories and processing facilities, as well as from vehicles that transport chemicals or other hazardous substances. Road vehicles, trains, and (more rarely) aircraft can all suffer accidents that cause a release of hazardous materials. (Humboldt County 2019)

An assessment of current and historical conditions was compiled from Phase I ESAs recently completed for District controlled parcels within the project site boundary (Toeroek, 2022a, Toeroek 2022b), Additional ESAs completed for parcels adjacent to the project site that were reviewed include Town of Samoa Community Services District corridor study (SHN, 2018), Samoa Roundhouse Property (Weston, 2017) and the Nordic Aquafarms project EIR (GHD 2021). The Phase I ESAs covered approximately 300 acres that included the project site and the surrounding areas for potential environmental impacts. The ESAs were conducted in accordance with the standard of practice as outlined in the American Society for Testing and Materials (ASTM) No. E1527-13.

The purpose of the Phase I ESAs was to identify recognized environmental conditions (RECs) and historical RECs that may be present on the site and nearby through records review, site reconnaissance, interviews with individuals having site knowledge, and reviewing any information available in the public domain. The ESA focuses on the presence of hazardous substances that were stored onsite, may have been released, and pose a potential threat to human health and the environment. The EDR report identified sites that government regulatory agencies have reported as having environmental concerns, such as, releases of contaminants to the environment or use of hazardous materials.

Areas identified at the project site for known release to the environment include former aboveground diesel storage tanks, an underground fuel storage tank, and impacts from use of wood preservative. Investigation, monitoring, and remediation for impacts to soil and groundwater at these sites have occurred under regulatory agencies that include the North Coast Regional Water Quality Control Board (RWQCB) and Humboldt County Division of Environmental Health (HCDEH).

Additional RECs identified at the site from historic operations that have the potential to be encountered during ground disturbance include:

- Dioxin/furan contamination from refuse burners
- Fuels and lubricants from heavy machinery use
- Polychlorinated biphenyls (PCBs) from transformers at the site
- Lead-based paint presence due to the age of structures.

SHN evaluated information for facilities adjacent to the project area that were identified in the Phase ESAs as a potential threat to the project area. The former Evergreen pulp mill (south), the closed Samoa solid waste disposal site (SWDS; west), and the Samoa Roundhouse site (north) have all been assessed for environmental conditions. Each site has been through a phase of investigation and cleanup as necessary. Monitoring for impacts to groundwater are currently occurring at the former pulp mill and the SWDS. A recently completed soil gas investigation at the SWDS show potential impacts from the facility are not migrating offsite (SHN, 2022). Impacts to the project site from adjacent properties do not appear to pose a significant threat to human health and the environment.

Additional items of note from records review and site reconnaissance include no domestic water wells present on the site, groundwater is encountered at shallow depths (3 to 5 feet below grade in some areas) and flows to the Bay, and approximately 25 acres of the site has concrete surface available for reuse (Figure 2). No inspection of the offshore portions of the project site or environmental lien searches were reported to have occurred during completion of the Phase I ESA.

Table O below, describes a brief site history and COCs for the four of the seven properties that are in or adjacent to the Project Site.

Table O Overview of Contamination History

Site Name	Contaminants of Concern	Details of Contamination, Media, Extent, Concentrations, etc.	Groundwater Depth/Direction	Hazard Rank
Simpson, Samoa Wood Mill (within Project site)	Petroleum hydrocarbons	Removal of underground storage tank (UST) used to store gasoline in July 1999. Activities were conducted under a permit from the Humboldt County Department of Environmental Health (LOP Case No. 12719). Although the UST was inspected to show it was intact with no obvious holes or degradation, results of soil and groundwater sample analyses indicated that impacts had occurred from operation of the UST. Investigation and excavation of impacted soil was conducted. The Site received closure with no further action required by the North Coast Regional Water Quality Control Board on December 16, 2002.	3.5 ft	3
Simpson Timber Company, Samoa Facility (within Project site)	Petroleum hydrocarbons	Location of former aboveground diesel storage tanks (AST) and fueling area. Two 10,000-gallon steel ASTs used to store diesel were removed from the site in 1998. Indication of a release at the site from operations showed impacts to soil and groundwater (RWQCB Case No. 1NHU764). Investigation and monitoring at the site were conducted in addition to the excavation of impacted soils in June 2003. Closure was requested for this site from the RWQCB in November 2007 after concentrations of diesel in groundwater showed levels below the taste and odor threshold of 100 micrograms per Liter (ug/L).	5 ft	3
Simpson, Samoa Wood Mill (within Project site)	Pentachloro-phenol (PCP)	Location of wood preservative application area showed impacts to soil and groundwater (RWQCB Case No. 1NHU764). Investigation and monitoring at the site were conducted in addition to the excavation of impacted soils in March 2001. Closure was requested for this site from the RWQCB in June 2002 after concentrations of PCP in groundwater showed no detectable concentrations.	9 ft	
Samoa Pacific Group (adjacent to the Project site - West)	Petroleum hydrocarbons	Location of a former service station with underground storage tanks (UST) that were replaced with ASTs in 1986. Impacts to soil and groundwater at the site from storage of gasoline occurred. Activities were conducted under oversight from the Humboldt County Department of Environmental Health (LOP Case No. 12800). Investigation, monitoring, and remediation was conducted, The Site received closure with a deed restriction from the North Coast Regional Water Quality Control Board on December 23, 2014.	6 to 8 ft	3

Site Name	Contaminants of Concern	Details of Contamination, Media, Extent, Concentrations, etc.	Groundwater Depth/Direction	Hazard Rank
Humboldt Bay Harbor Recreation and Conservation District Redwood Marine Terminal II (adjacent to Project site – South)	Dioxins and furans, metals, pH, chlorinated solvents	Corridor area extends into former Evergreen Pulp Incorporated pulp mill (Case No. 1NHU892), which is an open case with North Coast Regional Water Quality Control Board (NCRWQCB), and former LP Samoa Solid Waste Disposal Site (Facility ID # 1B73061OHUM). In corridor area, there is a potential to encounter low concentrations of dioxins/furans, metals, and spent pulping liquors in soil and groundwater, and potential landfill waste in soil.	Approximately less than 1 foot below ground surface (bgs) in winter (highest recorded) in an east-southeasterly direction.	1
Former Hammond Lumber Railroad (within Project site)	Petroleum hydrocarbons, metals, pesticides, herbicides, and SVOCs	Railroad rights-of-ways have typically been found to contain heavy metals, petroleum hydrocarbons, creosote, chlorinated compounds, pesticides and polychlorinated biphenyls (PCBs) in soil and/or groundwater. There is potential for soil and groundwater impacts in vicinity, and downgradient of former Hammond Lumber Railroad corridor which is included in project site.	Unknown	3

Dredging

Dredging operations will cover an area of approximately 190 acres that extend from the project shoreline, south of the Samoa Federal Navigation Channel, and past the Samoa Channel Turning Basin (Figure F). Initial dredging for the project is estimated to be in the range of 5.5 to 6 million cubic yards (cy) with subsequent maintenance dredging conducted at a frequency and volume yet to be determined. Dredging depths will need to accommodate berth for vessels, wet storage for floating platforms and fully assembled devices, and a sinking basin for vertical integration of the wind turbine devices that will range from -40 to -60 feet (ft) mean lower low water (MLLW). Material types known to be present in these areas consist of recently deposited fine-grained material (silty clay) that overlay historical deposits of sand and fine-grained sediment.

The intended placement of dredge material includes offshore disposal and the possibility of beneficial reuse. Options for disposal and potential beneficial reuse being considered for this project that include:

- Barge transport for disposal at the Humboldt Open Ocean Disposal Site (HOODS)
- Pumping to Samoa Beach for beach replenishment
- Pumping offshore (for example, ¼ mile) of Samoa Beach
- Hopper placement offshore of Samoa Beach
- Pumping or mechanical conveyor to the upland for use as fill at the RMMT project site
- Pumping material to the HBHRCD's temporary storage site for dewatering and future upland placement and reuse
- Placement onto salt marshes to maintain the elevation required to support salt marsh ecosystems as sea level rise.

Dredging operations in Humboldt Bay are under the regulatory oversight of the U.S. Army Corps of Engineers (USACE) San Francisco District, Dredge Material Management Office (DMMO). The DMMO is comprised of multiple agencies providing oversight specific to the area of dredging and final placement of the material. The offshore disposal of Humboldt Bay dredged material currently occurs at HOODS under the jurisdiction of the U.S. Environmental Protection Agency, Region 9 in San Francisco (EPA). Any material dredged from Humboldt Bay that is considered for beneficial reuse and upland placement will be under the jurisdiction of North Coast Regional Water Quality Control Board (RWQCB) in Santa Rosa, California. The California Department of Fish and Wildlife (DFW), California Coastal Commission (CCC), USACE, and the State Lands Commission may additionally have permitting requirements for dredging nearshore and upland reuse.

A PEIR was completed (ICF 2020) that analyzed 25 dredging sites in north and south Humboldt Bay; three sites where sediment may be dewatered and temporarily stockpiled, located at Samoa Lagoons, Redwood Marine Terminal II, and Fields Landing Boatyard; and 76 sites where sediment may be beneficially used.

Each project dredge segment will be characterized individually with material collected from multiple core stations for sample testing using guidance from the Ocean Testing Manual (OTM REF). Any area of increased risk will undergo a more comprehensive testing program for approval of offshore disposal at HOODS. If the results of sediment chemical testing exceed regulatory screening

levels, then further analysis for bioaccumulation and toxicity may be required to ensure dredging and material placement are not harmful on the water column, sediment column, and food web. Sediment analysis for evaluation of open ocean disposal or beneficial reuse can range from texture analysis for grain size distribution to complete characterization of potential impacts from constituents of concern on the aquatic and benthic environment.

Schools

The project site is approximately 0.16 miles to Peninsula Union School, located off Vance Avenue and Cookhouse Road. The next closest school is Redwood Coast Montessori in Manilla, approximately 2 miles to the north, off Peninsula Drive and New Navy Base Road (Highway 255).

Airports

Samoa Field Airport (City of Eureka) is approximately 1.8 miles south of the closest point of land based operations on the Project Site, closer for activities within the Navigation Channel and wet storage areas. Samoa Field Airport is unattended, and provides day time use only but is closed at night. Murray Field (Humboldt County) is approximately 3.5 miles to the northeast. Murray Field Airport provides general aviation services. Murray Field Airport is an attended aviation operation and provides day and night operations with a lighted field. California Redwood Coast – Humboldt County Airport (also known as Arcata–Eureka Airport and Arcata Airport) in McKinleyville (Humboldt County) is 11 miles to the north and Rohnerville Airport (Humboldt County) is 17 miles to the south. (Humboldt County 2019)

Humboldt County GIS identifies the Airport Compatibility Zones (2021). While the Project Site is outside of any Land Use Compatibility Zone, there are designated areas within the Bay as having compatibility Zone 2 near the Samoa Boat Ramp Park, a Zone 4 directly south of it and a large portion from Fairhaven south to almost the North Spit as Zone 6. (See Figure G).

Emergency Response

The Humboldt County Office of Emergency Services (HCOES) is the primary coordination agency for emergencies and disasters affecting residents, public infrastructure, and government operations in the County. The Humboldt Operational Area includes the entirety of the County and its cities, towns, and special districts, in coordination with independent tribes. The Sheriff is designated Director of Emergency Services for the Operational Area by local ordinance. The HCOES coordinates and participates in emergency planning, response, and recovery under the direction of the Sheriff and in collaboration with local, state, and federal partners.

The HCOES is responsible for providing emergency management services in working with local cities, fire and law enforcement agencies, and special districts. HCOES helps to support and implement emergency mitigation and preparation activities across Humboldt County, secure resources for first responders, and coordinate with state and federal emergency agencies. HCOES manages and coordinates local mitigation programs, including Humboldt County Fire Safe Council which serves as a forum for implementing Community Wildfire Protection Plans (CWPP), and Humboldt County's Operational Area Local Hazard Mitigation Plan (LHMP). (Humboldt County 2019)

The HCOES is responsible for maintaining the Humboldt County Emergency Operations Plan, which serves to address the planned response to extraordinary emergency situations associated with natural disasters, technological incidents, and national security emergencies in, or affecting,

Humboldt County. OES also maintains specific hazard response plans for earthquake, flooding, tsunamis, coastal storms, and other events. These response plans are used to determine the most appropriate evacuation routes based on the nature and extent of hazard. Pre-disaster evacuation route planning is addressed through a variety of efforts including the FEMA local hazard mitigation plan program, the seismic retrofit program for state bridges and overpasses, tsunami response planning, and the application of the CAL FIRE SRA standards for emergency access. (Humboldt County 2019)

The Humboldt County Emergency Operations Plan does not list specific emergency response or evacuation routes (Humboldt County 2015). Hazards that may occur include spills of hazardous materials or broken utility lines or downed electrical lines as a result of earthquakes, floods, tsunamis or fires. The Project Site is a large expanse of open area that would allow sheltering in place, depending on the hazard presented. Tsunami sheltering in the near vicinity is located at the Samoa Cookhouse, adjacent to the northern portion and, approximately 1 mile from the furthest land based operation. See Section VIII Geology, for additional information. Evacuation routes for major hazards include New Navy Base Road/ Highway 255 to Arcata. Secondarily if the Samoa Bridge (Highway 255) to Eureka is open, this would be additionally available. Both access to waterways by boat, and air lifts from Samoa Airport may be accessible. Hazards related to mishaps in the Bay have emergency services available including a Harbor District Fire Boat, emergency spill containment services, backup tug services. A U.S. Coast Guard Station is located 2.8 miles to the south. See below for further discussion on fire abatement by local fire/emergency medical service providers. (Humboldt County 2019)

Wildland Fires

The State of California Department of Forestry and Fire Protection (CALFIRE) has been assessing the risk of wildfire in the State for decades. As a part of their assessment, CALFIRE's Fire and Resource Assessment Program (FRAP) was developed to assess potential wildfire hazards on a landscape level which can aid land management planners in determining appropriate strategies for fuels reduction and aid county and local officials in determining appropriate mitigation strategies for communities. (Humboldt County 2019)

The FRAP mapping process has been incorporated into the Humboldt County General Plan (Humboldt County 2017) and the updated Safety Element (HCSE, 2023), which shows that the western portion of the county, along the Pacific Coast in general, as having a mosaic of Fire Hazard Severity Zones (FHSZ) ranging from "Unzoned" to "Moderate" and "High" (CALFIRE 2024). For the Samoa Peninsula, the FHSZ are predominantly Moderate, with areas of High FHSZ clustered around the Samoa Cookhouse and vegetated areas to the north. Most of the Project Site is designated as Unzoned. (Humboldt County 2019)

The proposed project area is served by a variety of urban and wildland fire agencies including Peninsula Community Fire District, Arcata Fire Protection District, CALFIRE, as well as other local area fire departments under mutual-aid services. The Peninsula Community Fire District is a volunteer fire service that maintains station located in the community of Samoa and Fairhaven. (Humboldt County 2019)

Regulatory Setting

Federal

The primary federal agencies with responsibility for hazardous materials management include the U.S. Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), and the Department of Transportation (DOT). Federal laws, regulations, and responsible agencies relevant to the project are summarized below.

Federal Toxic Substances Control Act/Resource Conservation and Recovery Act/Hazardous and Solid Waste Act

The federal Toxic Substances Control Act (1976) and the Resource Conservation and Recovery Act of 1976 (RCRA) established a U.S. Environmental Protection Agency-administered program to regulate the generation, transport, treatment, storage, and disposal of hazardous waste. The RCRA was amended in 1984 by the Hazardous and Solid Waste Act, which affirmed and extended the "cradle to grave" system of regulating hazardous wastes.

Comprehensive Environmental Response, Compensation, and Liability Act/Superfund Amendments and Reauthorization Act

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as "Superfund," was enacted by Congress on December 11, 1980. This law (42 U.S.C. 103, 690, etc. and 43 USC 960 etc.) provides broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. CERCLA establishes requirements concerning closed and abandoned hazardous waste sites, provides for liability of persons responsible for releases of hazardous waste at these sites, and establishes a trust fund to provide for cleanup when no responsible party can be identified. CERCLA also enabled the revision of the National Contingency Plan (NCP). The NCP (Title 40 CFR Part 300) provides the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, and/or contaminants. The NCP also established the National Priorities List. CERCLA was amended by the Superfund Amendments and Reauthorization Act on October 17, 1986. (ICF, 2022)

Spill Prevention Control and Countermeasures (SPCC)

The SPCC Program is listed in 40 CFR Part 112 requires the development of a plan for the aggregate storage of 1,320 gallons or greater of petroleum products

Stafford Act and Disaster Mitigation Act

The Stafford Act and Disaster Mitigation Act (or Hazard Mitigation Planning) requires state, local, and tribal governments to develop and submit to the Federal Emergency Management Agency a mitigation plan that outlines processes for identifying natural hazards, risks, and vulnerabilities of the jurisdiction. Humboldt County has developed a **2020 Humboldt County Operational Area Hazard Mitigation Plan-Final Volume 1: Area-Wide Elements** and Volume 2: Planning Partner Annexes in 2019.

Occupational Safety and Health Administration

The Occupational Safety and Health Administration's (OSHA) mission is to ensure the safety and health of American workers by setting and enforcing standards; providing training, outreach, and education; establishing partnerships; and encouraging continual improvement in workplace safety and health. OSHA establishes and enforces protective standards and reaches out to employers and employees through technical assistance and consultation programs. OSHA standards are listed in 29 CFR 1910. (ICF, 2022)

Toxic Substances Control Act

The Toxic Substances Control Act came into law on October 11, 1976. The Toxic Substances Control Act authorized USEPA to secure information on all new and existing chemical substances, as well as to control any of the substances that were determined to cause unreasonable risk to public health or the environment. (ICF, 2022)

Department of Transportation Hazardous Materials Regulations (49 CFR 100–185)

U.S. Department of Transportation Hazardous Materials regulations cover all aspects of hazardous materials packaging, handling, and transportation. Some of the topics covered include Parts 107 (Hazard Materials Program), 130 (Oil Spill Prevention and Response), 172 (Emergency Response), 173 (Packaging Requirements), 174 (Rail Transportation), 176 (Vessel Transportation), 177 (Highway Transportation), 178 (Packaging Specifications), and 180 (Packaging Maintenance). (ICF, 2022)

Section 401 of the Clean Water Act (CWA): Water Quality Certification

Under CWA Section 401, applicants for a federal license or permit to conduct activities that may result in the discharge of a pollutant into 'Waters of the US' must obtain certification from the state in which the discharge would originate or, if appropriate, from the interstate water pollution control agency with jurisdiction over affected waters at the point where the discharge would originate. Individual projects under the Proposed Project would require a Section 401 Water Quality Certification from the North Coast Water Board. The North Coast Water Board must certify that beneficial use of the dredged material would not violate state water quality standards and other applicable requirements. (ICF, 2022)

State Regulations

California Environmental Protection Agency

The California Environmental Protection Agency (Cal/EPA) was created in 1991. It unified California's environmental authority in a single cabinet-level agency and brought the California Air Resources Board, State Water Board, Regional Water Quality Control Board, CalRecycle, Department of Toxic Substances Control (DTSC), Office of Environmental Health Hazard Assessment, and Department of Pesticide Regulation under one agency. These agencies were placed under the Cal/EPA "umbrella" for the protection of human health and the environment to ensure the coordinated deployment of state resources. Their mission is to restore, protect, and enhance the environment and ensure public health, environmental quality, and economic vitality. (ICF, 2022)

Department of Toxic Substances Control

DTSC, a department of Cal/EPA, is the primary agency in California for regulating hazardous waste, cleaning up existing contamination, and finding ways to reduce the amount of hazardous waste produced in California. DTSC regulates hazardous waste primarily under the authority of the federal RCRA and the California Health and Safety Code (primarily Division 20, Chapters 6.5 through 10.6, and Title 22, Division 4.5). Other laws that affect hazardous waste are specific to handling, storage, transportation, disposal, treatment, reduction, cleanup, and emergency planning. (ICF, 2022)

- **USC 65962.5** (commonly referred to as the *Cortese List*) includes DTSC-listed hazardous waste facilities and sites, Department of Health Services lists of contaminated drinking water wells, sites listed by the State Water Board as having UST leaks or a discharge of hazardous wastes or materials into the water or groundwater, and lists from local regulatory agencies of sites with a known migration of hazardous waste/material. (ICF, 2022)

Hazardous Waste Control Act (§ 25100 et seq.)

DTSC is responsible for enforcing the Hazardous Waste Control Act (California Health and Safety Code § 25100 et seq.), which creates the framework under which hazardous wastes are managed in California. The law provides for the development of a state hazardous waste program that administers and implements the provisions of the federal RCRA cradle-to-grave waste management system in California. It also provides for the designation of California-only hazardous waste and development of standards that are equal to or, in some cases, more stringent than federal requirements. (ICF, 2022)

Unified Hazardous Waste and Hazardous Materials Management Regulatory Program

The Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (California Health and Safety Code, Chapter 6.11 §§ 25404–25404.9) provides authority to the Certified Unified Program Agency. The Certified Unified Program Agency for the project area is the Humboldt County Division of Environmental Health.

The Unified Hazardous Waste and Hazardous Materials Management Regulatory Program consolidates, coordinates, and makes consistent the administrative requirements, permits, inspections, and enforcement activities of hazardous materials programs including HazMat Business Plan Program, California Accidental Release Prevention Program, UST Program, AST Program, Hazardous Waste Generator Program, and Incident Response. (ICF, 2022)

CCR, Title 8 – Industrial Relations

Occupational safety standards exist in federal and state laws to minimize worker safety risks from both physical and chemical hazards in the workplace. The California Division of Occupational Safety and Health (Cal OSHA) and the federal OSHA are the agencies responsible for assuring worker safety in the workplace. Cal OSHA assumes primary responsibility for developing and enforcing standards for safe workplaces and work practices. These standards would apply to construction activities. (ICF, 2022)

California Labor Code (Division 5, Parts 1, 6, 7, and 7.5)

The California Labor Code is a collection of regulations that include regulation of the workplace to ensure appropriate training on the use and handling of hazardous materials and operation of equipment and machines that use, store, transport, or dispose of hazardous

materials. Division 5, Part 1, Chapter 2.5, ensures that employees who are in charge of handling hazardous materials are appropriately trained and informed with respect to the materials they handle. Division 5, Part 7, ensures that employees who work with volatile flammable liquids are outfitted with appropriate safety gear and clothing. (ICF, 2022)

Local Regulations

Humboldt Bay Area Plan – Local Coastal Program

3.14 Industrial – Protection Against Spillage – 30232

Protection against the spillage of crude oil, gas, petroleum products, or hazardous substances shall be provided in relation to any development or transportation of such materials. Effective containment and cleanup facilities and procedures shall be provided for accidental spills that do occur.

Industrial uses shall include mitigation and design features for compatibility with adjacent land uses; in particular, screening and/or landscaping to buffer adjacent residential and recreational uses.

New industrial development adjacent to areas planned for public recreation, natural resources, or residential use on the North Spit shall include mitigation measures, including at a minimum, setbacks, landscaping, and design controls to minimize significant conflicts with adjacent land uses.

3.17 Hazards – New Development – 30253

(1) Minimize risks to life and property in areas of high geologic, flood and fire hazard.

(2) Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding areas or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs.

Humboldt County General Plan Safety Element

Goal SG-1. Minimize Loss. Communities designed and built to minimize the potential for loss of life and property resulting from natural and human-made hazards.

- **Policy S-P33. Hazardous Waste.** Eliminate the use of toxic materials within Humboldt County, where feasible, and require the reduction, recycling, and reuse of such materials, to the greatest extent possible, where complete elimination of their use is not feasible. Require new development which may generate significant quantities of hazardous wastes to be consistent with all the goals and policies of the Hazardous Waste Management Plan.
- **Policy S-S14. Airport Land Use Compatibility Plan**. Development within the jurisdiction of Airport Land Use Compatibility Plans (ALUCP) will conform to the policies and standards of the ALUCP.
- **Policy S-S18. Humboldt County Operational Area Office of Emergency Services (OES)**. Local emergency management and response operations will be consistent with Humboldt County Operational Area Emergency Operations Plan and Humboldt County Ordinance 2203. (ICF, 2022)

Humboldt Bay Management Plan – Harbor Element Planning Policies

Dredging and Waterway Maintenance

- **HWM-2:** Dredging may be authorized to meet Plan purposes[95].
- **HWM-3:** Re-deposition of dredged materials within Humboldt Bay may be authorized to meet Plan purposes.

Toxic Materials Management

- **HTM-1:** Enhance public outreach and educational programs addressing the impacts of toxic materials to Humboldt Bay and surrounding lands and assist in educational efforts to prevent toxic spills. (ICF, 2022)

Humboldt County Ordinance 2203

Humboldt County Ordinance 2203 established the Humboldt Operational Area (OA) and identifies the Sheriff as Director of Emergency Services for the County. The Humboldt OA is composed of the County of Humboldt, serving as the lead agency, and all political subdivisions (cities and special districts). The HCOES assists the Sheriff in controlling and directing the effort of the emergency organization of the County and is part of the Special Operations Division within the Sheriff's Department.

Humboldt County Operational Area Hazard Mitigation Plan

The 2014 Humboldt County Operational Area Hazard Mitigation Plan Update is the County's plan to identify and reduce hazards before any type of hazard event occurs (Humboldt County 2014). The Hazard Mitigation Plan aims to reduce losses from future disasters such as dam failure, drought, earthquake, fish losses, flooding, landslide, severe weather, tsunami, and wildfire. The Hazard Mitigation Plan also includes a vulnerability analysis and proposed initiatives designed to minimize future hazard-related damage.

Humboldt County Emergency Operations Plan

The 2015 Humboldt County Emergency Operations Plan (EOP) Humboldt Operation Area addresses the planned response to extraordinary emergency situations associated with natural disasters, technological incidents, and national security emergencies in or affecting Humboldt County (Humboldt County 2015). The EOP addresses integration and coordination with other governmental levels when required. The EOP accomplishes the following:

- Establishes the emergency management organization required to mitigate any significant emergency or disaster affecting Humboldt County.
- Identifies the policies, responsibilities, and procedures required to protect the health and safety of Humboldt County communities, public and private property, and the environmental effects of natural and technological emergencies and disasters.
- Establishes the operational concepts and procedures associated with field response to emergencies, County Emergency Operations Center (EOC) activities, and the recovery process.

[5] The *Humboldt Bay Management Plan* represents the region's first ecosystem-based management approach intended to improve the management of Humboldt Bay.

Discussion

a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

While additional information is needed to further describe the types of materials used in transportation, construction and operation, measures will be incorporated into the design and operations that avoid or minimize impacts.

b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

The following mitigation measures will be needed:

- Prior to ground disturbance – implementation of a Phase II Environmental Site Assessment (ESA) to characterize areas of concern. This is currently planned.
- During disturbance – implementation of a soil and groundwater management contingency plan (SGMCP) to address hazardous materials encountered.

While additional information is needed to further describe the types of materials used in transportation, construction and operation, the EIR will assess the extent to which the application of existing regulations will address potential impacts.

c. Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

The project site is approximately 0.16 miles to Peninsula Union School, located off Vance Avenue and Cookhouse Road. While additional information is needed to further describe the types of materials used in transportation, construction and operation, the EIR will assess the extent to which the application of existing regulations and other measures will address potential impacts.

d. Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

The EIR will assess the effects of the Project related to disturbance of contamination. At a minimum, the following mitigation measures will be needed:

- Prior to ground disturbance – implementation of a Phase II Environmental Site Assessment (ESA) to characterize areas of concern.
- During disturbance – implementation of a soil and groundwater management contingency plan (SGMCP) to address hazardous materials encountered.

e. Be located within an airport land use plan area or, where such a plan has not been adopted, be within two miles of a public airport or public use airport, and result in a safety hazard or excessive noise for people residing or working in the project area?

Additional information is needed describing the conflicts anticipated with Samoa Airport scheduling and the wet storage and towing scheduling in the height restriction areas, as identified in the Airport Land Use Plan.

f. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Additional information is needed to develop a site specific emergency evacuation plan, in coordination with emergency responders that further describe the transportation, construction and operational aspects of the project and, in addition, incorporates measures into the design and operations that avoid or minimizes conflicts with emergency evacuation.

g. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?

The project site (other than the biological wetland mitigation sites) will be fully developed and not prone to exacerbating wildland fires. This is further discussed in Section XX Wildfire.

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X. Hydrology and Water Quality

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:					
a.	Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	☒	☐	☐	☐
b.	Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☒	☐	☐	☐
c.	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would:	☒	☐	☐	☐
	1. Result in substantial erosion or siltation on or off site;	☒	☐	☐	☐
	2. Substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or off site;	☒	☐	☐	☐
	3. Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☒	☐	☐	☐
	4. Impede or redirect flood flows?	☒	☐	☐	☐
d.	In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☒	☐	☐	☐
e.	Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☒	☐	☐	☐

Affected Environment

Surface Water

Humboldt Bay is the largest embayment in California north of San Francisco and consists of three regions (from north to south): Arcata Bay, Entrance Bay, and South Bay. Humboldt Bay is approximately 14 miles long and of variable width ranging from approximately 0.5 mile in Entrance Bay to approximately 4 miles across the widest part of Arcata Bay. Entrance Bay connects to the Pacific Ocean via Entrance Channel. Humboldt Bay is separated from the Pacific Ocean by a sand spit

incised by two armored rubble-mound jetties. These fabricated jetties, constructed by U.S. Army Corps of Engineers (USACE), which are approximately 2,000 feet (ft) apart, define the Entrance Channel to Humboldt Harbor, which requires regular dredging to maintain safe navigation. Humboldt Bay is relatively shallow and approximately 70 percent of the Bay is comprised of tidal mud flats (located predominately in Arcata and South Bays) that are exposed at low tide (ICF 2020).

Humboldt Bay is within the Eureka Plain Hydrologic Unit (HU), which also encompasses the four primary watersheds that drain into the Bay: Jacoby Creek (draining 17 square miles), Freshwater Creek (draining 31 square miles), Salmon Creek (draining 17 square miles), and Elk River (draining 29 square miles. The Proposed Project area is entirely within the Eureka Plain HU (ICF 2020).

Freshwater inflow to Humboldt Bay is hydrologically dominated by the tidal exchange with the Pacific Ocean. Tides in the Bay are mixed semidiurnal and display tidal amplification that is most pronounced to the north with an increase of up to 1 ft; the mean tide range is approximately 5 ft, and the diurnal range is approximately 7 ft (ICF 2020).

Regional and Local Setting

The Project Site is located on the North Spit of the Samoa Peninsula between the Pacific Ocean and the western edge of Humboldt Bay. Near the Project Site, the northern part of Humboldt Bay (Arcata Bay) connects to a constricted channel leading to the Harbor Entrance via three subparallel channels (Eureka, Middle, and Samoa Channels). The primary channel leading to the Harbor Entrance is referred to as the Eureka Channel. The project site occurs along the Samoa Channel, as it leads into the confluence with the main Eureka Channel.

The entire North Spit is underlain by late Pleistocene to Holocene age marine shoreline and eolian deposits. Hookton Formation sediments are composed of coarse granular nearshore marine deposits that transition to fine-grained coastal plain deposits. A deep water well drilled near the project site indicates Hookton Formation sediments to be at least 200 feet thick at this location (GHD, 2021).

The project site is sheltered from ocean swells and exposed to local wind waves. Preliminary analysis indicates a peak wave height (Hmo) of 2.2 ft and period (Tp) of 2.7 seconds.

The National Oceanic and Atmospheric Administration (NOAA) Station 9418817 at Samoa, Humboldt Bay, California is the closest tidal station to the project site. Tidal datums are provided in Table P and are based on the National Tidal Datum Epoch 1983-2001.

Table P Tidal Datums

Tidal Parameter	Elevation (ft MLLW)	Elevation (ft NAVD88)
Highest Astronomical Tide (HAT)	+9.36	+8.64
Mean Higher High Water (MHHW)	+7.37	+6.65
Mean High Water (MHW)	+6.65	+5.93
Mean Low Water (MLW)	+1.30	+0.58
North American Vertical Datum of 1988 (NAVD88)	+0.72	0.00
Mean Lower Low Water (MLLW)	0.00	-0.72
Lowest Astronomical Tide (LAT)	-2.43	-3.15

Tidal current measurements inside Humboldt Bay were analyzed at the Chevron Pier in North Bay which is located between the Bay entrance and the Project Site and represents the general flow field to/from the project site. The prevailing flood currents flow in the northeast direction and ebb currents in the southwest direction. Ebb currents are stronger, with a maximum of up to 3.4 knots. Maximum flood currents can reach 1.9 knots.

Table Q: Tidal Currents at Chevron Pier

Parameter	Current Velocity (knots)
Maximum Ebb	3.4
Mean Ebb	0.9
Maximum Flood	1.9
Mean Flood	0.7

Humboldt County has moderate temperatures and considerable precipitation. Temperatures along the coast in July are usually in the 60s (Fahrenheit) and vary only 10 degrees Fahrenheit (°F) from summer to winter, although a greater range is found over inland areas. Temperatures of 32°F or lower are experienced nearly every winter throughout the area. Maximum temperatures for the year often do not exceed 80°F on the coast. July mean maximum temperatures are in the 60s Fahrenheit throughout an area of 15 to 30 miles in width along the coast. In most years, rainfall occurs each month of the year, although precipitation amounts are negligible from June through August. Seasonal totals average more than 40 inches in the driest area and exceed 100 inches in zones of heavy precipitation. About 90 percent of the seasonal total rainfall falls in the seven months of October through April. Most of the rainfall is associated with storm fronts that move in from the Pacific Ocean. There are few thunder showers in the mountains during the summer, but they are infrequent. Because of the moisture and moderate temperature, the average relative humidity is high. (Humboldt County 2019). Largely as a result of the proximity of the cool Pacific Ocean, the coastal area has a cool, stable temperature regime. With increasing distance from the ocean, the marine influence is less pronounced and inland areas experience wider temperature variations and lower humidity (Humboldt County 2019).

Local Drainage and Surface Water Quality

Natural surface water drainage patterns on the Samoa Peninsula are minimal due to the low relief, shifting landscape, and sandy (dune) soils with high infiltration rates. In addition, the project site area has been dramatically changed due to historic grading and filling as a result of site development for past timber processing and pulp mill operations; therefore, local surface drainage patterns are poorly defined on the peninsula. Stormwater facilities within the Project Site are remnants of past industrial uses. Much of the Project Site is paved or compacted from these past land uses. The Project Site will be subject to a Construction General Stormwater Pollution Prevention Plan (SWPPP) in compliance with State Water Quality Control Board Order No. 2009-0009, as amended by Order No. 2010-0014), and an Industrial SWPPP (in compliance with State Water Quality Control Board Order No. 2014-0057-DWQ).

Drainage patterns in the adjacent Humboldt Bay are well established. Impurities in the local surface runoff, shallow groundwater, and atmospheric deposition influence surface water quality within the Bay adjacent to the Samoa Peninsula. The quality of adjacent Humboldt Bay tidal waters is also dependent on such significant hydrological and biological parameters as the timing and magnitude of freshwater outflow, complex circulation patterns in the Bay, wind-driven mixing and

resuspension of fine-grained sediments, time-varying salinity gradients and water temperature, and nutrient loading. Humboldt Bay has been identified as an impaired water body relating to dioxide toxic equivalents and polychlorinated biphenyls (Humboldt County 2019)

Water quality in the Pacific Ocean is dependent on a number of regional and global factors, including climate and weather changes, currents and upwelling, and seasonal output from local rivers and estuaries. Although the water quality in Humboldt Bay is generally considered good and is determined largely by the quality of water entering the Bay from the nearshore Pacific, the Bay is included on the 303(d) list as impaired for dioxin toxic equivalents (from industrial point sources, waste storage/storage tank leaks, and unknown sources), and PCBs although source(s) of the polychlorinated biphenyls (PCBs) is/are unknown. The listing of Humboldt Bay for PCBs is based on shellfish tissue samples from the Bay that exceeded the evaluation guideline of 3.9 parts per billion (ppb). PCBs generally enter air, water, and soil during their manufacture, use and disposal. Although no longer produced in the United States, PCBs are persistent chemical compounds and thus do not readily break down in the environment, and bioaccumulate in the tissue of living organisms (e.g., fish, birds, humans). In surface water, PCBs generally adsorb (bind) to organic matter and settle in sediment or remain suspended with particulates because these compounds are not readily soluble in water. Dioxins (also polychlorinated dibenzodioxins) are a family of chemically related compounds that, like PCBs, are persistent environmental pollutants (ICF 2020).

Dioxins are relatively ubiquitous in the environment, have a low solubility in water, and therefore adsorb to sediments, and are bioaccumulative. Dioxins are a byproduct of combustion and various industrial processes, including chemical manufacturing, chlorine bleaching of paper pulp, and smelting (ICF 2020).

The primary land use in the Eureka Plain HU is timber production, which, along with agricultural uses in the non-forested areas of the Humboldt Bay watersheds, results in erosion and thus contributes to sediment in watershed streams and ultimately to Humboldt Bay, particularly in winter months. Most of the sediment in the Bay; however, is from the nearshore Pacific Ocean. When suspended, silt and clay in sediment cause surface water turbidity[6]. In Humboldt Bay, the nearshore turbidity tends to be higher than turbidity in the water column in the deeper channels (ICF 2020).

As summarized in Table Q, Elk River (lower and upper) and Freshwater Creek are 303(d)-listed as impaired for sedimentation/siltation and Jacoby Creek watershed is listed for sediment. The Lower Elk River is also included on the 303(d) list for indicator bacteria. A total maximum daily load (TMDL)(see Section IV, *Regulatory Setting*) for sediment has been established for the Upper Elk River watershed to achieve sediment-related water quality standards (ICF 2020).

In addition to sediment discharge, agricultural land uses including confined animal facilities, grazing, and commercial-scale flower and bulb farms, contribute discharges to runoff such as nutrients, bacteria, and pesticides. Bacteria-laden runoff is the primary agricultural-related discharge in the Humboldt Bay watersheds. Urban runoff to the Bay from past as well as current land uses, including households, small businesses, and wood-product factories, also contributes pollutants in stormwater runoff. Further, publicly owned wastewater treatment facilities of the cities of Eureka and Arcata also discharge to Humboldt Bay. Water pollutants from ships and watercraft, such as petroleum products, and anti-fouling biocidal compounds (i.e., organotin compounds such as

[6] Turbidity is the reduction of water clarity due to the presence of suspended particles and is commonly used as an indicator for the general condition of water clarity. Turbidity in surface water is comprised of naturally occurring and/or introduced organic matter and inorganic minerals, such as silt, clay, industrial waste, sewage, and algae.

tributyltin) in hull paints and coatings also contribute to the pollutant load in Humboldt Bay (ICF 2020).

Water quality objectives for surface waters, including Humboldt Bay, and groundwater, are established in the *Water Quality Control Plan for the North Coast Region* (Basin Plan) to protect beneficial uses of waters in the North Coast Region. The designated existing and potential beneficial uses for Humboldt Bay and its primary tributaries are identified in Table R. Specific to Humboldt Bay, the Basin Plan has established numeric pH objectives (maximum and minimum) and dissolved oxygen (DO) objectives. The maximum pH in the Bay should not exceed 8.5, and the minimum pH should not be depressed "below natural background levels" and DO concentrations must conform to a daily minimum objective of 6 milligrams per liter (mg/L). Although not specific to Humboldt Bay, the Basin Plan identifies narrative objectives for suspended sediment and turbidity to protect the beneficial uses of all waters in the North Coast region—the suspended sediment load and discharge rate should not be altered in such a manner as to cause a nuisance or adversely affect beneficial uses, and turbidity should not be increased more than 20 percent above naturally occurring background levels. In the case of turbidity, allowable zones of dilution within which higher percentages can be tolerated may be defined for specific discharges on the issuance of discharge permits or waiver thereof (ICF 2020).

Table Q. 303(d)-Listed Water Bodies in the Eureka Plain Hydrologic Unit

Water Body	Pollutant	Potential Sources	TMDL Scheduled Completion Date
Jacoby Creek watershed	Sediment	Unknown	2019
Freshwater Creek	Sedimentation/Siltation	Flow alteration/regulation/ modification	2017
		Removal of riparian vegetation	
Elk River – Upper and Upper Little South Fork	Sedimentation/Siltation	Flow alteration/regulation/ modification	2014
		Removal of riparian vegetation	
Elk River – Lower	Indicator Bacteria	Unknown[a]	2025
	Sedimentation/Siltation	Flow alteration/regulation/ modification	2014
		Removal of riparian vegetation	
Martin Slough	Indicator Bacteria	Unknown[a]	2025
Gannon Slough	Indicator Bacteria	Unknown[a]	2026
Jolly Giant Creek	Indicator Bacteria	Unknown[a]	2025
Humboldt Bay	Indicator Bacteria	Unknown[a]	2025
	Dioxin Toxic Equivalents	Industrial point sources	
		Waste storage/storage tank leaks (aboveground)	
		Unknown[a]	

Source: ICF 2020

a For the 303(d) list, the potential source of the pollutant is listed as "unknown" by default unless a source analysis has been performed or some other supporting information.

TMDL = toxic maximum daily equivalent; PCBs = polychlorinated biphenyls

Table R. Designated Beneficial Uses of Waters of the Eureka Plain Hydrologic Unit

Water Body	MUN	AGR	IND	PRO	GWR	FRSH	NAV	POW	REC-1	REC-2	COMM	COLD	WILD	RARE	MAR	MIGR	SPWN	SHELL	ESTa	AQUA	CUL
Jacoby Creek	E	E	E	P	E	E	E	P	E	E	E	E	E	E	—	E	E	—	E	P	E
Freshwater Creek	E	E	E	P	E	E	E	P	E	E	E	E	E	E	—	E	E	—	E	E	E
Elk River	E	E	E	P	E	E	E	P	E	E	E	E	E	E	—	E	E	—	E	P	—
Salmon Creek	E	E	E	P	E	E	E	P	E	E	E	E	E	E	—	E	E	—	E	P	E
Humboldt Bay	E	E	E	P	—	E	E	P	E	E	E	E	E	E	E	E	E	E	E	E	E

Source: ICF 2020

a EST use applies only to the estuarine portion of the waterbody.

E = existing beneficial use; P = potential beneficial use; "— " = does not apply.

AGR = Agricultural Supply; AQUA = Aquaculture; COLD = Cold Freshwater Habitat; COMM = Commercial and Sport Fishing; CUL = Native American Culture; EST = Estuarine Habitat; IND = Industrial Service Supply; MAR = Marine Habitat; MIGR = Migration of Aquatic Organisms; MUN = Municipal and Domestic Supply; PRO = Industrial Process Supply; RARE = Rare, Threatened, or Endangered Species; REC-1 = Water Contact Recreation; REC-2 = Non-Contact Water Recreation; SHELL = Shellfish Harvesting; SPWN = Spawning, Reproduction, and/or Early Development; WILD = Wildlife Habitat

Chemical Characterization of Sediment

Past and present land uses around Humboldt Bay have contributed to detectable sediment contamination by environmentally persistent chemical compounds. For example, dioxin-contaminated pentachlorophenol (a pesticide and wood preservative now banned in the U.S.), was used at several lumber-processing mills in the Humboldt Bay region and has been detected in sediment at multiple locations. Similarly, the use of tributyltin as a biocide in anti-fouling paint on ship and boat hulls, as well as on docks, to discourage the marine organisms such as barnacles and tubeworms, has also resulted sediment contamination in Humboldt Bay. As described in this section, over the years, sediment from several Locally Maintained Sites (LMSs) throughout Humboldt Bay has been analyzed for various contaminants including, metals, dioxins and furans, organochlorine pesticides and chlorinated herbicides, PCBs, and other environmentally persistent contaminants that adsorb to sediment. Overall, results from these sampling studies have shown that the presence of these contaminants is widespread, and that the sediment chemical profile of tested sites is generally similar. Accordingly, it is reasonable to assume that any future sediment sampling and analysis would yield generally similar results (ICF 2020).

Eureka Waterfront Sites and Woodley Island Marina

In early 2005, sediment core samples from 11 Eureka waterfront sites[7] and multiple locations at Woodley Island Marina were collected and analyzed for various physical properties as well as for the concentrations of multiple chemical compounds. Representative samples were collected at the

[7] Eureka waterfront sampling sites included: Dock 'B'; Small Boat Basin; Commercial Street Dock; Fisherman's Terminal/Landing Dock; F Street Floating Dock; I Street Dock; J Stree Dock; Adorni Dock; Bonnie Gool Guest Dock; Samoa Bridge Launch Ramp; and Coast Seafoods Dock.

proposed dredge project depths for each site. The analysis included testing for grain size, percent solids, total mercury, total organic carbon (TOC), total petroleum hydrocarbons (TPH), total volatile solids (TVS), metals, semi-volatile organics, PCBs, and speciated butyltins in sediment. The results from the 2005 testing were compared to the testing results conducted 1996 in order to determine changes in the quality of the sediment over time. The comparison of results (2005 v. 1996) indicated that mercury concentrations have decreased over time, and that metal and TVS concentrations have decreased at all sampling locations except at F Street Dock, where no change was noted. TPH concentrations decreased at four of the five comparison sites. In addition, at all sampling sites except Commercial Dock, concentrations of most semi-volatile organic compounds had decreased since 1996. PCBs were only detected at Coast Seafoods Dock, as well as at Landing Dock, where the PCB Arochlor 1260 was found at increased levels relative to 1996; Coast Seafoods Dock was not sampled/tested in 1996. Speciated butyltins were detected at I Street Dock (not sampled/tested in 1996), the Small Boat Basin, and Coast Seafoods Dock. For Woodley Island Marina, the comparison between 2005 and 1996 chemical results indicated that concentrations of most sampled compounds had either remained the same or decreased over time. However, increases in the concentrations of TPHs and most semivolatile compounds (e.g., fluoranthene) at multiple locations in the marina relative to 1996 testing were noted (ICF 2020).

In late 2005, sediment samples from the same 11 Eureka waterfront sites and Woodley Island Marina were tested for dioxin/furans[8] and pentachlorophenol. Three of the waterfront sites, Coast Seafoods Dock, Fisherman's Terminal, and F Street Dock were also tested for PCBs. Although detectable, dioxin and furan levels at the Eureka waterfront sites and Woodley Island Marina were considered "low", and dioxin levels were within typical background dioxin levels in the U.S. and Europe. PCBs were detected only at Coast Seafoods Dock at levels substantially lower than the upper limit for total PCBs in dredge spoils (i.e., 89 ppb v. upper limit of 3,100 ppb). Pentachlorophenol was detected at Woodley Island Marina, Small Boat Basin, and I Street Dock at concentrations lower than the reporting limit (ICF 2020).

A chemical analysis was done (August 2016) on sediment samples from the Eureka Small Boat Basin and Commercial Street Dock (proposed dredge sites NB-1 and NB-2, respectively). Testing results of these samples, specifically for constituents of concern including dioxins/furans, pentachlorophenol, PCBs, and polycyclic aromatic hydrocarbons (PAHs), were compared to results of historical samples collected in these areas in 1996 and 2005. The comparison determined that concentrations of most of these constituents had either decreased or remained the same since 1996 sampling. Test results for metals indicated concentrations were consistent over time and within the range of naturally occurring concentrations (ICF 2020).

Sediment testing was performed in December 2018 at Chevron's Eureka Marine Terminal dock. Sediment concentrations of various metals, PAHs, organochlorine pesticides (e.g., aldrin, chlordane), chlorinated herbicides (e.g., pentachlorophenol and dichlorophenoxyacetic acid [2,4-D]), dioxins/furans, PCBs, and organotin compounds were analyzed. The chemical analysis indicated that although several chemicals (including PAHs, TPHs, most metals tested, and dioxins/furans) were detected in sediment samples, concentrations were similar to background levels within

[8] Polychlorinated dibenzofurans (furans) are environmentally persistent, bioaccumulative compounds that have a low water solubility. Furans are byproducts of industrial processes, including chlorine bleaching of paper pulp. Local point-sources of dioxin/furans in Humboldt Bay encountered in bay sediments include past pulp mill air discharges and runoff-entrained wood preservative chemicals from timber products processing facilities.

Humboldt Bay. It is of note that no chlorinated herbicides, organochlorine pesticides, PCBs, or organotins were detected (ICF 2020).

Tsunami and Flood Hazards, including Sea Level Rise

FEMA 100-year flood zone

A portion of the Project area is within a 100-year flood zone. (ICF 2020). Figure H shows the FEMA 100-year flood zone (2017) for the Project area with a Zone AE elevation of 10-12 feet.

Sea-Level Rise Projections

A Draft State of California Sea Level Rise Guidance: 2024 Science and Policy Update produced by the California Ocean Protection Council (OPC), in partnership with the Ocean Science Trust (OST) and a scientific Task Force (Task Force) in January 2024, replaces the previous 2018 'State of California Sea-Level Rise Guidance', and marks the fourth iteration of statewide guidance since 2010 for state and local decision-makers to incorporate best available science on sea level rise into planning, design, permitting, investments, and other decisions. (California Sea Level Rise Guidance (2024)

Five Sea Level Scenarios are constructed and presented for California. Each scenario is defined according to the target value of GMSL rise in 2100 and represent the statewide average:

- Low (0.3m or 1.0ft by 2100)
- Intermediate-Low (0.5m or 1.6ft by 2100)
- Intermediate (1.0m or 3.3ft by 2100)
- Intermediate-High (1.5m or 4.9ft by 2100)
- High (2.0m or 6.6ft by 2100)

Sea Level Scenarios were produced at each individual NOAA tide gauge location and these incorporate a local estimate of vertical land motion. The difference between the individual tide gauge numbers and the statewide average for any given year or scenario reflects the contribution of vertical land motion in that location. (California Sea Level Rise Guidance (2024)

Table S: Sea Level Scenarios for N. Spit, Humboldt Bay.

Year	Low	Int-Low	Intermediate	Int-High	High
2020	0.3	0.4	0.4	0.4	0.4
2030	0.5	0.6	0.6	0.6	0.7
2040	0.7	0.8	0.9	1	1.1
2050	0.9	1	1.2	1.4	1.6
2060	1.1	1.3	1.5	2	2.4
2070	1.3	1.5	1.9	2.7	3.5
2080	1.4	1.8	2.5	3.6	4.7
2090	1.6	2.1	3.1	4.5	6
2100	1.8	2.4	3.9	5.5	7.3
2110	1.9	2.7	4.6	6.5	8.7
2120	2.1	3	5.3	7.3	9.9
2130	2.3	3.3	5.9	8	10.8
2140	2.4	3.5	6.5	8.6	11.9
2150	2.6	3.8	7.1	9.3	12.8

Median values of Sea Level Scenarios, in feet, for each decade from 2020 to 2150, with a baseline of 2000. All median scenario values incorporate the local estimate of vertical land motion. (California Sea Level Rise Guidance (2024)

Tsunami Inundation

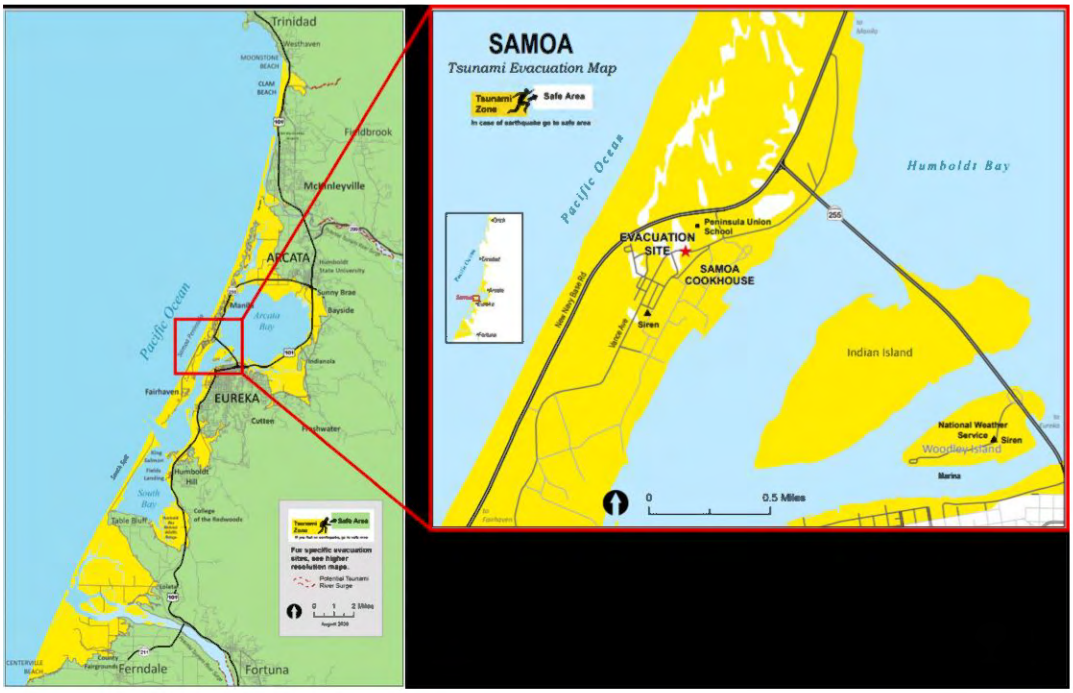
Humboldt Bay is located on the western edge of the North America Plate near the southern end of the Cascadia subduction zone (CSZ). Earthquakes generated by rupture on the CSZ have generated tsunamis in the past. The project area is located in a low-lying coastal setting directly onshore of an active subduction zone (CSZ) capable of generating very large magnitude earthquakes. Earthquakes along subduction zones have historically been one of the principal sources of tsunami generation. There is significant geologic evidence along the coast of much of the Pacific Northwest documenting the occurrence and effects of past tsunamis. In addition, there is local geologic evidence of past tsunamis, in the form of clean sand layers (interpreted as a tsunami deposit) that bury coastal wetlands surrounding Humboldt Bay. (Humboldt County 2019).

Much of the low-lying Samoa Peninsula is subject to tsunami inundation and is at substantial risk in the event of a large locally generated tsunami event. Other than isolated high dunes northwest of the town of Samoa, the entire Samoa Peninsula typically is modeled as being subject to inundation during moderate to large tsunami events. The maps show that, except for part of the Samoa Lagoons material processing site, all of the Project site is in a tsunami inundation area. The arrival time of a near-source tsunami is generally understood to be short, due to the small site-to-source distance. On the Samoa Peninsula, tsunami signs indicate where one is “entering” or “leaving” a tsunami inundation area and point to an established “Tsunami Evacuation Zone” (Humboldt County 2019). The Project is located such that if a tsunami inundates the Samoa Peninsula there would be a high likelihood of release of pollutants.

Publicly available tsunami hazard assessments for the Humboldt Bay area were compiled**. Figure I** illustrates the tsunami hazard and evacuation map in the project area. Based on these assessments, several conclusions were made, including:

- Tsunami inundation depths could vary between 0 and 3 ft at the Project area.

- Tsunami waves come from the Pacific Ocean, over-wash the Samoa Peninsula, then flow into Humboldt Bay.
- Tsunami travel time depends on the location of earthquake sources and can vary from 10 to 20 minutes.
- The official Samoa evacuation site is located on high ground, near the Peninsula Union School.



Groundwater

The study area overlies portions of both the Eureka Plain groundwater basin and the Mad River groundwater basin/Mad River Lowland groundwater subbasin. Recharge to the alluvium in the Eureka Plain groundwater basin is from precipitation as well as from seepage from Freshwater Creek, and Elk and Eel rivers. Groundwater recharge in the Mad River Lowland subbasin is from percolation from the Mad River and small tributary creeks in the foothills to the east of Arcata as well as from deep percolation to floodplain deposits from precipitation and applied water (ICF 2020).

Groundwater quality in the Eureka Plain groundwater basin is considered generally acceptable for most uses. Groundwater impairments in the Eureka Plain groundwater basin include localized areas of boron, iron, manganese, and phosphorus. Impairments to groundwater in the Mad River Lowland subbasin include iron, and localized areas of manganese, fluoride, and phosphorus; seawater intrusion has occurred in shallow aquifers near the ocean and Humboldt Bay (ICF 2020).

Groundwater Hydrology

The project area lies within the North Coast Hydrologic Region and overlies the western portion of the Eureka Plain Groundwater Basin. The Eureka Plain Groundwater Basin is bounded by the Little Salmon Fault to the south, Humboldt Bay and Arcata Bay to the west and northwest, and by Wildcat series deposits to the east. The primary water-bearing formations in the basin include the Pliocene

Hookton Formation and, to a lesser extent, Holocene dune sand west of Humboldt Bay and alluvial deposits southeast of Arcata Bay and along the Elk River (Humboldt County 2019)

Beach and dune sand deposits occur in a continuous strip along the coast. Modern beach deposits occur along the immediate coastline; while the entire length of the Peninsula is covered with a veneer of eolian sand that forms a broad dune field. The dune sand is up to 30 feet thick and attains a maximum width of three-fourths of a mile along the North Spit between the entrance to Arcata Bay and the mouth of the Mad River. The dune sand is loose, subangular to subrounded, well sorted, fine grained, and gray or brownish gray in color. The dune field is developed as a source of water supply for shallow wells or well points that are driven into the sand far enough to penetrate the lens of freshwater overlying seawater. Recharge to the dune sand is almost wholly from local precipitation (Humboldt County 2019). Based on past subsurface investigations, groundwater exists under unconfined conditions at depths ranging from approximately 12 to 16 feet below ground surface with elevations ranging from 5 to 9 feet NAVD88. No confining layers have been observed.

Results of an October 2010 tidal influence study indicate that groundwater elevations along the bay margin in the vicinity of the former pulp mill are influenced by tidal fluctuations in Humboldt Bay. Tidal influence diminished with distance away from the Bay and it is assumed that tidal influence would begin to increase in proximity to the ocean side of the peninsula (Humboldt County 2019)

Groundwater Quality

The communities of Fairhaven and Finntown, surrounding industrial properties, Samoa Peninsula Union School, the Samoa Boat Ramp and Campground, and smaller commercial operations located on or near the City of Eureka Samoa Field Airport, do not have a wastewater collection and treatment system, and instead use individual septic systems that discharge to individual leachfields. Most of the existing septic systems are aging and are poorly suited for the soil and groundwater conditions that exist on the peninsula. Preventative maintenance is uncommon and failing systems are rarely identified until surface seepage is reported to the Humboldt County Division of Environmental Health. The North Coast RWQCB is concerned about the impacts of partially treated effluent discharged to leachfields, groundwater, and Humboldt Bay due to the peninsula's high water table and sandy soils. (Humboldt County 2019). Likewise, most development in the general region occurred prior to Federal or State stormwater regulations and therefore have little if any stormwater treatment facilities that protect groundwater resources.

As discussed in Section XIX Utilities, the Project as well as surrounding areas will be part of future wastewater treatment at the Samoa WWTF, managed by the Peninsula Community Services District and the Project will also be subject to current stormwater management regulations.

Regulatory Setting

Federal

Clean Water Act (CWA)

The federal CWA (33 U.S. Code [U.S.C.] § 1251 et seq.) establishes the institutional structure for U.S. Environmental Protection Agency (USEPA) to regulate point and nonpoint discharges of pollutants into the Waters of the U.S. (WoUS), establish water quality standards, and implement pollution control programs, such as setting wastewater standards for industry. The CWA authorizes USEPA to delegate many permitting, administrative, and enforcement aspects of the law to state governments.

In California, the State Water Board has been designated by USEPA to develop and enforce water quality objectives and implementation plans. The State Water Board has delegated the specific responsibilities for the development and enforcement actions to the Regional Water Boards. Humboldt Bay is located within Region 1, the jurisdictional area of the North Coast Water Board (ICF 2020).

Section 303: Impaired Waters

CWA Section 303(d) requires states to identify waters that are not attaining water quality standards (303(d) list) and include a priority ranking of such waters. The priority ranking considers the severity of the pollution and the uses to be made of such waters. The State Water Board and Regional Water Boards address water quality impairments that are caused by multiple dischargers and other sources of pollution by developing TMDLs, which set water quality objectives or targets and allocate allowable loads for sources of pollution. A TMDL represents the maximum load (usually expressed as a rate, e.g., grams methylmercury per year) of a pollutant that a water body can assimilate and not result in impairments. A TMDL describes the reductions needed to meet water quality objectives and allocates those reductions among the sources in the watershed. To meet federal and state requirements, TMDLs must include the following elements: description of the problem; numerical water quality target; analysis of current loads; load reductions needed to eliminate impairments and plan/program of implementation to achieve the needed load reductions; and monitoring to document program progress (ICF 2020).

Section 401: Water Quality Certification

Under CWA Section 401, applicants for a federal license or permit to conduct activities that may result in the discharge of a pollutant into Waters of the United States (WoUS) must obtain certification from the state in which the discharge would originate or, if appropriate, from the interstate water pollution control agency with jurisdiction over affected waters at the point where the discharge would originate. Individual projects under the Proposed Project would require a Section 401 Water Quality Certification from the North Coast Water Board. The North Coast Water Board must certify that the Project would not violate state water quality standards and other applicable requirements (ICF 2020).

Section 402: Permits for Discharge to Surface Waters

CWA Section 402 regulates discharges to surface waters through the National Pollutant Discharge Elimination System (NPDES) program, which is administered by the Regional Water Boards. An NPDES permit sets specific discharge limits for point sources discharging pollutants into WoUS and establishes monitoring and reporting requirements, as well as special conditions. Typically, NPDES permits are issued for a 5-year period by the Regional Water Boards (ICF 2020).

Dischargers whose projects disturb at least 1 acre of soil or whose projects disturb less than 1 acre but are part of a larger common plan of development that in total disturbs 1 or more acres, are required to obtain coverage under the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit) (Order 2009-0009-DWQ as amended by 2010-0014-DWQ and 2012-0006-DWQ). Construction activity subject to this permit includes clearing, grading and ground disturbances such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. Disposal of water from dewatering activities to surface waters requires coverage under a NPDES permit (ICF 2020).

The Construction General Permit requires the development of a site-specific SWPPP by a certified Qualified SWPPP Developer. The SWPPP must identify an effective combination of soil erosion and sediment controls, as well as non-stormwater best management practices (BMPs). The Construction General Permit requires that the SWPPP define a program of regular inspections of the BMPs and, in some cases, sampling of water quality parameters. The North Coast Water Board administers the NPDES stormwater permit program in Humboldt County. Individual projects under the Proposed Project would potentially require an SWPPP and the development of BMPs to manage stormwater runoff for construction- related activities for beneficial use projects, depending on the area of ground disturbance at the proposed locations (ICF 2020).

Section 404: Permits for Fill Placement in Waters and Wetlands

Section 404 of the CWA requires that a permit be obtained from USACE for the discharge of dredged or fill material into navigable WoUS, their tributaries, and associated wetlands. USACE is responsible for regulating non-Federal dredging and dredged material discharge activities through the 404-permit program. Activities regulated by Section 404 permits include dredging, bridge construction, flood control actions, and some fishing operations. Section 404 permits may be issued for only the least environmentally damaging practical alternative (i.e., authorization of a proposed discharge is prohibited if there is a practical alternative that would have fewer adverse effects and lacks other significant adverse consequences). Issuance of a 404 permit may require physical and chemical testing of dredged material prior to disposal or use for beneficial purposes. Effluent from dredged material dewatering basins is considered a dredged material discharge under Section 404 and is also subject to water quality certification under Section 401. Individual projects under the Proposed Project would require a Section 404 permit. USACE cannot issue or verify any permit until a water quality certification, or a waiver of certification has been issued pursuant to CWA Section 401 (ICF 2020).

Coastal Zone Management Act of 1972

The CZMA, administered by the NOAA, provides for the management for coastal resources in the U.S. through a state and federal partnership. The CZMA allows states to develop a coastal management program, which establishes the requirements for activities conducted on coastal lands (ICF 2020).

National Flood Insurance Program

Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program to provide subsidized flood insurance to communities that comply with FEMA regulations limiting development in floodplains. FEMA also issues flood insurance rate maps identifying which land areas are subject to flooding. The maps provide flood information and identify flood hazard zones in the community. The design standard for flood protection is established by FEMA, with the minimum level of flood protection for new development determined to be the 1-in-100 annual exceedance probability (i.e., the 100-year flood event).

Federal Antidegradation Policy

The federal antidegradation policy is set forth in 40 Code of Federal Regulations (CFR) §131.12SWRCB Order No. 68-16 incorporates the federal antidegradation policy into the state policy for water quality control and ensures consistency with federal CWA requirements. This federal regulation establishes a three-part test for determining when increases in pollutant loadings or other adverse changes in surface water quality may be permitted:

- Existing instream water use and level of water quality necessary to protect the existing uses shall be maintained and protected.
    - Where the quality of the waters exceed levels necessary to support propagation of fish, shellfish, and wildlife, and recreation in and on the water, that quality shall be maintained and protected, unless the state finds after full satisfaction of the intergovernmental coordination and public participation provisions of the state's continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In allowing such degradation or lower water quality, the state shall assure water quality adequate to protect existing uses fully. Further, the state shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable BMPs for nonpoint source control.
    - Where high quality waters constitute an outstanding National resource, such as waters of National and State Parks and wildlife refuges and waters of exceptional recreational or ecological significance, water quality shall be maintained and protected.

The federal anti-degradation policy serves as a catch-all water quality standard to be applied where other water quality standards are not specific enough for a particular waterbody or where other water quality standards do not address a particular pollutant.

State

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act; California Water Code §§ 13000 et seq.) establishes the basis for water quality regulation within California. The State Water Board administers the CWA through the Porter-Cologne Act, pursuant to which the State Water Board oversees nine Regional Water Boards that regulate the quality of waters within their regions. Pursuant to the Porter-Cologne Act, each of the nine Regional Water Boards must adopt a regional water quality control plan (also referred to as a "basin plan"), which must identify beneficial uses for the waters within the region, water quality objectives to protect those beneficial uses, and a program of implementation to achieve the water quality objectives. The Proposed Project is within the jurisdictional area of the North Coast Water Board, which establishes water quality standards for receiving waters through the Basin Plan. The Basin Plan includes numeric and narrative water quality objectives for several key water quality constituents, including pH, DO, water temperature, trace metals, turbidity, suspended sediment, and oils and grease (ICF 2020).

In California, discharges of waste that are not NPDES "discharges of pollutants" require the issuance of Waste Discharge Requirements (WDRs) unless otherwise waived. Discharges of waste that are not subject to NPDES permits typically include runoff from nonpoint sources, such as agricultural and timber harvest activities and associated waste discharges, to land or to groundwater. Disposal of water from dewatering activities to land requires coverage under General Waste Discharge Requirements (ICF 2020).

WDRs prescribe requirements, such as limitations on temperature, toxicity, or pollutant levels, as to the nature of any discharge (Water Code § 13260[a]). WDRs may also specify conditions where no discharge would be permitted and may also include monitoring and reporting requirements (ICF 2020).

The Porter-Cologne Act requires that a "report of waste discharge" be compiled for any discharge of waste, including discharges of dredged or fill material, that could affect the quality of the waters of the state with the appropriate Regional Water Board. On receipt of a report of waste discharge, the Regional Water Board may then issue WDRs designed to ensure compliance with applicable water quality objectives and other requirements of the basin plan. In California, the Porter-Cologne Act requires that any discharge that could affect the quality of waters of the state, including waters not under federal jurisdiction, be permitted through WDRs. 401 certifications issued by the Regional Water Boards also serve as WDRs under State Water Board Water Quality Order 2003-0017-DWQ (ICF 2020).

As discussed above, and identified in Table Q, Jacoby Creek, Freshwater Creek and the Elk River watershed are sediment-impaired waterbodies. A sediment TMDL has been established for the upper Elk River, and the North Coast Water Board is in the process of establishing a TMDL for sediment in the Freshwater Creek watershed. A sediment TMDL is also required for Jacoby Creek. TMDLs are also required, although not yet established, for indicator bacteria for the lower mainstem Elk River, Gannon Slough, and Martin Slough, and for PCBs and dioxin toxic equivalents for Humboldt Bay (ICF 2020).

River and Harbors Appropriation Act of 1899

The River and Harbors Appropriation Act of 1899 (Rivers and Harbors Act) addresses activities that involve the construction of dams, bridges, dikes, etc., across any navigable water (33 CFR § 329.4) or placing obstructions to navigation outside established federal lines and excavating from or depositing material in such waters. Section 10 of the Rivers and Harbors Act (33 U.S.C. § 403) prohibits the unauthorized obstruction or alteration of any navigable water of the U.S.; structures or work outside the limits defined for navigable WoUS require a Section 10 permit if the structure or work affects the course, location, or conditions of a water body. This applies to any dredging or disposal of dredged materials. Individual projects under the Proposed Project would require a Section 10 permit from USACE (ICF 2020).

Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act (SGMA) (Water Code § 10720 et seq.), effective January 1, 2015, requires that "groundwater resources be managed sustainably for long-term reliability and multiple economic, social, and environmental benefits for current and future beneficial uses" and that sustainable groundwater management "is best achieved locally through the development, implementation, and updating of plans and programs based on the best available science." SGMA tasks local agencies in basins designated as high and medium priority to halt overdraft and bring groundwater basins into balanced levels of pumping and recharge in order to avoid undesirable results. SGMA requires local agencies in high- and medium-priority basins to form groundwater sustainability agencies (GSAs) to manage basins sustainably and requires those GSAs to adopt groundwater sustainability plans (GSPs). The Eureka Plain groundwater basin and the Mad River groundwater basin/Mad River Lowland groundwater subbasin have both been designated as low-priority groundwater basins (ICF 2020).

California Coastal Act

The California Coastal Act (CCA) established policies to protect marine resources, coastal waters, estuaries, wetlands, water quality, and environmentally sensitive habitat areas. The policies of the California Coastal Act constitute the statutory standards applied to planning and regulatory

decisions made by the California Coastal Commission (CCC) and local governments. The CCC manages development along the California Coast except for San Francisco Bay. The CCC requires that each coastal jurisdiction prepare a Local Coastal Plan (LCP), including a coastal land use plan. The LCP is developed by each municipality for their jurisdiction that falls within the coastal zone. The LCP also includes zoning ordinances and zoning district maps, and, where required by the coastal land use plan, other applicable implementation measures (see Section XI, *Land Use and Planning*, for descriptions of the relevant LCPs in the plan area; ICF 2020).

Article 4 of the CCA requires that marine resources be maintained, enhanced, and where feasible, restored. The act also requires that the quality of coastal waters, streams, wetlands, estuaries, and lakes be maintained and, where feasible, restored through minimizing adverse effects of wastewater discharges and entrainment, controlling runoff, preventing depletion of groundwater supplies and substantial interference with surface waterflow, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams. The act further requires that the marine environment be protected against the spillage of crude oil, gas, petroleum products, and hazardous substances, and that diking, filling, or dredging (including maintenance of existing navigational channels, vessel berthing and mooring areas, and boat launching ramps) of open coastal waters, wetlands, estuaries, and lakes be permitted in accordance with other applicable provisions under the California Coastal Act, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects (ICF 2020).

Coastal Development Permits (CDPs) are required for any development within the Coastal Zone. "Development" is broadly defined and includes dredging and discharge or disposal of any dredged material. Exemptions to the requirement to obtain a CDP include "maintenance dredging of existing navigation channels or moving dredged material from navigation channels to a disposal area outside of the Coastal Zone, pursuant to a permit from USACE" (PRC § 30610c; ICF 2020).

The Project is located within the Coastal Zone, within both County and State's jurisdiction. All new development proposed on tide and submerged lands, and other public trust lands must receive a permit from the Commission (PRC 30519(b), and 30416(d)).

Section 30231 of the Coastal Act states:

> The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface waterflow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

Section 30253 of the Coastal Act states in part:

> New development shall do all of the following:
>
> (a) Minimize risks to life and property in areas of high geologic, flood, and fire hazard.
>
> (b) Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area…
>
> Sections 30253(a) and (b) of the Coastal Act require minimization of risks in areas of high geologic and flood hazards.

Section 30230 and 30231 of the Coastal Act require that marine resources and water quality of coastal waters be maintained, enhanced, and (where feasible) restored to protect marine life, biological productivity, areas and species of special biological significance (including eelgrass beds), and human health. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes. In addition, Section 30232 of the Coastal Act provides for the protection against the spillage of crude oil, gas, petroleum products, or hazardous substances in relation to any development or transportation of such materials.

State Water Resources Control Board – Ocean Plan

The Ocean Plan, as amended in 2019, is one of five statewide water quality control plans established by the State Water Resources Control Board to preserve and enhance California's territorial ocean waters for the use and enjoyment of the public. This is achieved by controlling the discharge of waste into the ocean and seawater intake. Discharge of waste can include stormwater runoff, municipally treated sewage outflow, and other discharges by industry under regional and state board permits. These plans, which are the State Water Board's master water quality planning documents, designate beneficial uses, water quality goals, and include programs to achieve these objectives.

The Ocean Plan states:

> The beneficial uses of the ocean waters of the State that shall be protected include industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance (ASBS); rare and endangered species; marine habitat; fish migration; fish spawning and shellfish harvesting.

State Water Resources Control Board – Thermal Plan

The SWRCB adopted the 1975 Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (Thermal Plan), which contains water quality objectives, including for coastal waters and enclosed bays.

North Coast RWQCB NPDES Permit

Projects that discharge stormwater runoff to WoUS from land disturbances greater than one acre require a General Construction Stormwater Discharge Permit from the RWQCB, as required under NPDES Order No. 2009-0009, as amended by Order No. 2010-0014. To obtain a permit, a discharger files a Notice of Intent to be included under the State's NPDES permit. General conditions of the permit require that dischargers must eliminate non-stormwater discharges to stormwater systems, develop and implement a SWPPP, and perform inspections of stormwater pollution prevention measures.

North Coast Regional Water Quality Control Board

RWQCBs adopt and implement water quality control plans (Basin Plan) which recognize the unique characteristics of each region with regard to natural water quality, actual and potential beneficial uses, and water quality problems. The North Coast Basin Plan (NCRWQCB 2018) is the applicable Basin Plan to the project site, the objectives of which are described below.

NCRWQCB Order No. R1-2009-0045, Waste Discharge Requirements for Low Threat Discharges to Surface Waters in the North Coast Region, applies to discharges of construction dewatering. This order requires development of a best management practices/pollution prevention plan to characterize the discharge and to identify specific measures to control the discharge, such as sediment controls to ensure that excessive sediment is not discharged and flow controls to prevent erosion and flooding downstream of the discharge.

The North Coast Basin Plan provides a definitive program of actions to preserve and enhance water quality and protect beneficial uses of all regional waters. Additionally, it describes the Regional Water Board's provisions for public participation and provides the framework for the development of discharge regulation.

The Basin Plan is the basis for the Regional Water Board's regulatory programs. Regional Water Board orders cite the Basin Plan's beneficial uses, water quality objectives, and prohibitions applicable to a particular discharge. The Basin Plan is used by other agencies in their permitting and resource management activities. Specifically, the Basin Plan states:

- Designates beneficial uses of surface waters and groundwaters.
- Sets narrative and numeric objectives that must be attained or maintained to protect beneficial uses.
- Defines implementation programs that include specific prohibitions, action plans, and policies to achieve the water quality objectives.
- Describes the Regional Water Board's monitoring activities.

The Basin Plan water quality objective for ocean waters states:

> The provisions of the State Water Board Water Quality Control Plan for Ocean Waters of California (Ocean Plan) and Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (Thermal Plan) and any revisions thereto shall apply to ocean waters within the North Coast Region.

Local

Humboldt Bay Area Plan (HBAP)

The HBAP (Humboldt County 2014), a component of Humboldt County's LCP, establishes policies that govern the use of approximately 21,500 acres of land in the unincorporated area around Humboldt Bay and over 20 miles of Pacific coastline. The HBAP identifies land uses and standards by which development (including discharge or disposal of dredged material) would be evaluated within the Coastal Zone (ICF 2020).

Humboldt Bay Area Plan of the Local Coastal Program

> 3.14 – Industrial Coastal Marine Environment
>
> In addition to any other policies established pursuant to this division, the policies of the state with respect to water quality as it relates to the coastal marine environment are that:
>
> a. Wastewater discharges shall be treated to protect present and future beneficial uses, and, where feasible, to restore past beneficial uses of the receiving waters. Highest priority shall be given to improving or eliminating discharges that adversely affect any of the following:
>
> (1) Wetlands, estuaries, and other biologically sensitive sites.

(2) Areas important for water contact sports.

(3) Areas that produce shellfish for human consumption.

(4) Ocean areas subject to massive waste discharge.

Ocean chemistry and mixing processes, marine life conditions, other present or proposed outfalls in the vicinity, and relevant aspects of area-wide waste treatment management plans and programs, but not of convenience to the discharger, shall for the purposes of this section, be considered in determining the effects of such discharges. Toxic and hard-to-treat substances should be pretreated at the source if such substances would be incompatible with effective and economical treatment in municipal treatment plants.

d. Independent baseline studies of the existing marine system should be conducted in the area that could be affected by a new or expanded industrial facility using seawater in advance of the carrying out of the development.

3.14 Industrial – Protection Against Spillage

Protection against the spillage of crude oil, gas, petroleum products, or hazardous substances shall be provided in relation to any development or transportation of such materials. Effective containment and cleanup facilities and procedures shall be provided for accidental spills that do occur.

a. Industrial uses shall include mitigation and design features for compatibility with adjacent land uses; in particular, screening and/or landscaping to buffer adjacent residential and recreational uses.

New industrial development adjacent to areas planned for public recreation, natural resources, or residential use on the North Spit shall include mitigation measures, including at a minimum, setbacks, landscaping, and design controls to minimize significant conflicts with adjacent land uses.

Section 3.17 (Hazards) states in part:

*** 30253. New Development shall:

1. Minimize risks to life and property in areas of high geologic, flood and fire hazard.

2. Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding areas.

The tsunami hazard policy in the HBAP was amended in 2012 to prohibit new habitable living space below the predicted tsunami run-up elevation calculated at maximum tide plus a minimum of three (3) feet to account for future sea level rise and one foot of freeboard space, as well as other measures to reduce tsunami hazard (Section 3.17(B)(3)). Section 3.17(B) (Hazards, Development Policies) states in part:

3. Tsunamis–New development below the level of the 100-year tsunami run-up elevation described in Tsunami Predictions for the West Coast of the Continental United States (Technical Report H-78-26 by USACE) shall be limited to public access, boating, public recreation facilities, agriculture, wildlife management, habitat restoration, and ocean intakes, outfalls, and pipelines, and dredge spoils disposal.

4. Flood Plains–No critical facilities should be permitted to locate within the 100-year flood plain. Utility lines may cross hazard zones if there is no reasonable alternative and provisions are made to mitigate the hazard. Non-critical facilities should be permitted in the 100-year flood plain only if adequate flood control measures, such as control works, compact fill, etc., that would result in a site being beyond or above the 100-year flood extend, are provided. Further, the County will continue to review development in light of and impose conditions consistent with the National Flood Insurance Program.

Section 3.30(B) (Natural Resources Protection Policies and Standards, Development Policies) states in part:

> 1. Coastal Streams, Riparian Vegetation And Marine Resources
>
> *** 30231. The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface waterflow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

As part of the HBAP, Section 4.10(B) (Rural Plan Designations-SAMOA TOWN MASTER PLAN LAND USE DESIGNATION OVERLAY) states in part:

> STMP (Hazards) Policy 3:
>
> New development associated with the provision of critical or significant community support functions (such as waste water treatment, provision of potable or firefighting water, or fire and life safety command and equipment centers) or that may be converted into critical community shelter facilities in an emergency, or structures that house vulnerable populations that cannot be readily evacuated, including hospitals, schools, and care facilities for the elderly and/or disabled, shall be designed and located in a manner that will be free of the risk of catastrophic failure associated with earthquake or tsunami hazard, taking into account a minimum of 4.5 feet of sea level rise per century. The final approved plans for such facilities shall be reviewed and stamped as conforming to this standard by a California licensed professional civil engineer or a California licensed professional engineering geologist.

The STMP Overlay, policies, EIR and CDP includes a number of policies, mitigation measures, and conditions of approval which will either apply to the applicable land area portion of this project or be superseded in the permitting and approvals process for this project.

Humboldt Bay Management Plan

The2007 Humboldt *Bay Management Plan* identifies goals and policies addressing the maintenance of channels and marinas in Humboldt Bay, including maintenance dredging and use of dredged materials (ICF 2020). According to the California Harbors and Navigation Code and HBMP, the shoreline of Humboldt Bay, beyond the Project Site's eastern parcel boundaries, is under the jurisdiction of the Harbor District and subject to the water use designations and policies outlined in the HBMP. The HBMP Plan Boundary is defined as all the tidelands and submerged lands of Humboldt Bay shoreward to a tidal elevation of mean higher high water (MHHW), an area covering approximately 27 square miles. This planning boundary was chosen because it represents that portion of Humboldt Bay under the regulatory jurisdiction of the Harbor District, as defined by the California Harbors and Navigation Code. As defined in ES Section 2.3.1 of the HBMP, the bay waters (from MHHW) east of the Project Site (outside of the Project Site boundary) are classified under the Harbor use designation. The Harbor use designation classifies 'harbor-related activities" as including "channel maintenance, channel improvement, dredging projects, port marketing and shipping facility improvements, oil spill response, navigation safety education, and oceanographic research".

Section 2.2 of the HBMP States; "This section generally describes the main features that are necessary for the harbor to function as a working port, including the jetties at the Bay entrance, the bar and entrance channel, maintained shipping channels within the Bay, turning basins, shoreline

protection and improvements, docks and other landside improvements, and key waterfront sites used for coastal-dependent industry. HBMP Section III, pages 164-179 include a set of policies governing the use of the Harbor-designated areas". (HBMP 2007)

Water Quality Control Plans or Sustainable Groundwater Management Plans

Water Quality Control Plans are discussed above in Regulatory Setting. There are no Sustainable Groundwater Management Plans within or affected by the Project Site/Project.

Discussion

a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?

There is the potential for impacts related to water quality at the Project site. The Project Site is subject to hydrologic hazards and stormwater runoff. Construction aspects of the Project will meet regulatory standards and build elements to withstand hydrologic forces including coastal flooding, tsunamis and sea level rise. The stormwater system will capture and treat water before it is discharged to Humboldt Bay.

b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

The project will replace asphalt with highly compacted gravels in such a manner that the site will continue to restrict permeability with a possible minor increase in impermeable surface. This will likely affect groundwater to some degree but there is no groundwater management plan for the basin. Meeting stormwater regulations and decreasing use of septic systems will improve groundwater resources in the area.

c.1. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would: Result in substantial erosion or siltation on or off site?

No stream or river will be altered. There may be a minor increase in impervious surface through the addition of coarse dense aggregate, but there will also be substantial improvements to the site's drainage, stormwater system and shoreline protection features. Additionally, during construction and operations, best management practices will be implemented to minimize the potential for erosion.

c.2. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would: Substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or off site?

No stream or river will be altered. There may be a minor increase in impervious surface through the addition of coarse dense aggregate, but there will also be substantial improvements to the site's drainage, stormwater system and shoreline protection features. With these measures, it is not expected that there will be a substantial increase in the rate or amount of surface runoff in a manner that would result in flooding on or off site.

c.3. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would: Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

There may be a minor increase in impervious surface through the addition of coarse dense aggregate, but there will also be substantial improvements to the site's drainage, stormwater system and shoreline protection features. The stormwater system is appropriately sized so as not to create or contribute to runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.

c.4. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would: Impede or redirect flood flows?

There may be a minor increase in impervious surface through the addition of coarse dense aggregate, but there will also be substantial improvements to the site's drainage, stormwater system and shoreline protection features. The stormwater system is appropriately sized so as not to create or contribute to runoff water that would exceed the capacity of existing or planned stormwater drainage system. The project also includes components that will capture and direct offsite stormwater. Due to these components, the Project is not expected to impede flood flows, though there will be some redirection of the flows.

d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

A tsunami (or coastal flooding) that inundates the Samoa Peninsula would result in the release of pollutants over the entire Project area; as such, the Project should be evaluated in the context of the potential impacts to the site. Construction aspects of the Project will be required to meet regulatory standards and build elements to withstand hydrologic forces including coastal flooding, tsunamis, and sea level rise. It is unknown at this time what the operational details are, including standards, to protect structures and assembled WTG units from hydrologic forces. Details would need to be sufficient to evaluate impacts related to partially and fully integrated WTGs on land. The EIR will describe and evaluate potential pollutants during construction and operation.

e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

See earlier responses in this section. The project will be replacing asphalt with highly compacted gravels and new stormwater features. Surface runoff will not cause flooding offsite and is controlled through existing regulations. The EIR will describe and evaluate potential pollutants during construction and operation. There are no Sustainable Groundwater Management Plans within or affected by the Project.

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XI. Land Use and Planning

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:					
a.	Physically divide an established community?	☒	☐	☐	☐
b.	Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☒	☐	☐	☐

Affected Environment

Land Use Patterns

Humboldt Bay is a complex ecosystem and valuable resource for California and the nation because of its natural resources, its aesthetic appeal and recreational opportunities, its ecological services, economic benefits, and its vital transportation links. Visitors and Humboldt County residents value Humboldt Bay for its natural and anthropogenic attributes. Areas around the Bay have historically and currently used for a mixture of built and natural environments. Portions of the diked former tidelands around Humboldt Bay are utilized for agriculture, primarily livestock grazing for dairy and beef production. The largest urban concentrations are in Arcata (population approximately 16,651) and Eureka (population approximately 25,866). (ICF 2020)

Shipping, commercial, and recreational fisheries, boating, and mariculture are important parts of the economy and culture in Humboldt Bay. Petroleum products, forest wood products, and pulp are important types of cargo arriving or leaving Humboldt Harbor. Seafood is commercially and recreationally harvested from shore and from boats. Recreational fishermen also harvest seafood from kayaks. The largest recreational boating facilities are two public marinas, the Woodley Island Marina, owned and operated by the Harbor District, and the Eureka Public Marina, owned and operated by the City of Eureka. Mariculture is limited to north Humboldt Bay, where oysters and clams are grown. The mariculture industry has a major stake in the maintenance of good water quality because it is critical for growth of oyster and clam seed and adults. (ICF 2020)

The U.S. Army Corps of Engineers (USACE) efforts to stabilize the harbor entrance and maintain channels into and within the bay began in 1881. Construction of the two jetties stabilizing the entrance to Humboldt Bay began in 1889 and the last major modifications were made in 1973 after storms destroyed both jetty heads. At present, USACE annually dredges the ebb shoal bar and between the two jetties. This entrance channel and its interior shipping channels are frequently dredged by the USACE, and starting in 1990 the sediment—mostly clean sand—is disposed of at the Humboldt Open Ocean Disposal Site (HOODS) approximately 3 miles west of the Bay's entrance. Until recently, the federal channels inside the bay were dredged annually; however, they are now dredged less frequently because of funding. (ICF 2020)

Existing Land Uses

The Samoa Peninsula is a sparsely populated narrow coastal landform, known as a "spit", which forms a barrier between the Pacific Ocean and Humboldt Bay. Connected to the mainland on the northern end, it is accessible from the City of Arcata, which is located at the north end of Humboldt Bay. On the south, the spit is open to the navigation channel that allows access from the Pacific Ocean to Humboldt Bay. Existing surrounding land uses are a mixture of residential, commercial, industrial, and public facilities. Residential uses are generally concentrated in the unincorporated communities of Samoa, Finntown, and Fairhaven, which predominately have single-family residences with some multi-family developments (such as the adjacent Phyllis Rex Samoa Townhomes). Large industrial uses exist between the residential areas. Commercial services are minimal, with the most prominent being the Samoa Cookhouse restaurant. (Humboldt County. 2019).

As noted above, the Project Site and surrounding area is overwhelmingly industrial area with the nearest residential communities being the Town of Samoa and Phyllis Rex Samoa Townhomes located immediately west/northwest of the Project Site. Fairhaven and Finntown are located approximately 1.3 miles to the southwest.

Transportation networks on land include State Highway 255 and New Navy Base Road, with direct connections via LP Drive, Vance Avenue, and Cookhouse Road. The Samoa Bridge to the direct north connects the Project Site with the City of Eureka. Separate pedestrian and bicycle pathways are undefined or not constructed within surrounding areas. Several nearby public accesses exist to the beaches and Ocean to the west.

The Project Site has direct access to Humboldt Bay and its Navigation Channel leading out to the Pacific Ocean.

Public facilities in the area include the Peninsula Elementary School in the town of Samoa, the Samoa Peninsula Fire Department in Fairhaven, and the U.S. Coast Guard Station Humboldt Bay, which is located near the southern tip of the spit. Additional public facilities include the Samoa Field Airport (formerly known as the Eureka Municipal Airport) that is managed by the City of Eureka, and the U.S. Bureau of Land Management (BLM) Samoa Dunes Recreation Area. Other public/community services are provided outside of the project area in surrounding developed communities. Public beach access is available at Bay Street Beach Access and Power Poles Beach Access, west of New Navy Base Road. (Humboldt County. 2019)

Industrial activities on the Samoa Peninsula and the project area have been occurring for over 100 years and include industrial lumber, pulp and paper production facilities, waterfront uses such as shipping and receiving, and commercial maritime operations. Several of the large industrial operations (pulp, paper, and plywood for example) have been in various states of operation and suspension for decades. DG Fairhaven Power Company currently uses wood waste products to produce energy that is provided to the California electric grid. Historic railroad infrastructure is present along the spit in various areas, which has been obscured by other more recent land uses. Newer industrial activities include the expansion of aquaculture and commercial-scale soil amendments. Much of the setting for the Proposed Project is within the setting of the previous industrial operations and its surrounding development.

Historic development activities in the project area consist of waterfront commercial/ industrial operations along the Humboldt Bay side, where access to the bay is vital for shipping products into

and out of the region, such as the Green Diamond Chip Export facility located off Bay Street, south of the Project Site, or various aquaculture operations (including Nordic Aquafarms Land-Based Aquaculture Project). Residential uses are clustered in small communities that were originally developed to provide housing for industrial operations. While still true today, the reduction in industrial operations on the peninsula has resulted in residents leaving the peninsula for jobs in the Eureka and Arcata areas. Residents wanting to enjoy the Bay and Ocean environs have moved into the vacated residences. (Humboldt County. 2019).

Land Use Designations and Zoning

Due to the size and extent of the Proposed Project, there are several overlapping land use plans and implementing land use regulating agencies, in addition to the numerous resource protection agencies. The primary land use regulations include; The Humboldt Bay Harbor Recreation and Conservation District (HBHRCD) has authority over the tidelands, granted in 1970 by the California State Lands Commission; the retained jurisdiction of the California Coastal Commission, regulated by the California Coastal Act of 1976; and The Humboldt Bay Area Plan (HBAP), approved by the California Coastal Commission originally in 1982 (and subsequently amended) as the Humboldt County local coastal plan for the coastal areas surrounding Humboldt Bay.

The Humboldt Bay Management Plan

The HBHRCD is successor to the State's interest in tide and submerged lands in Humboldt Bay area pursuant to Chapter 1283, Statutes of 1970, as amended. This includes former tidelands that were part of a settlement agreement in 1982. In order to efficiently balance the variety of uses in Humboldt Bay, the State of California established the Humboldt Bay Harbor, Recreation, and Conservation District (District) in 1970. The enabling legislation may be found in the California Harbors and Navigation Code, Appendix II. The statutory purpose of the District is to manage Humboldt Bay for the promotion of commerce, navigation, fisheries, recreation, and the protection of natural resources, and to acquire, construct, maintain, operate, develop, and regulate harbor works. The important point in this statement of purposes is the balance among potentially conflicting uses of Humboldt Bay, which the District continually strives to achieve, and which the Humboldt Bay Management Plan is intended to facilitate. The District has regulatory jurisdiction over all of the tide and submerged lands of Humboldt Bay. Therefore, the District exercises development authority over every development project proposed in Humboldt Bay; in many cases the District is also the lead agency for compliance with the requirements of the California Environmental Quality Act (CEQA; HBMP 2007).

California Coastal Commission

A portion of the Proposed Project is located in the retained jurisdiction of the California Coastal Commission (see Figure 3). The following section in the HBAP states that Coastal Development Permit (CDP) processing of both the State-retained jurisdiction and the tidelands and public trust lands are subject primarily to Chapter 3 policies of the Coastal Act.

> 2.30 POST CERTIFICATION ADMINISTRATION OF THE HUMBOLDT BAY PLAN
>
> B. In those areas where the California Coastal Commission retains coastal development permit authority on submerged lands, tidelands, and public trust lands (Public Resources Code Section 30519), the standard of review for proposed development is the Chapter 3 policies of the California Coastal Act. The provisions of this plan do not govern the review and approval of coastal

development permits within the Commission's retained jurisdiction. The Local Coastal Plan may be used as guidance.

For the area within the State Retained Jurisdiction, Chapter 3 Coastal Resources Planning and Management Policies apply. When there is a conflict in implementing the policies in HBAP Chapter 3, Section 30007.5 of the Coastal Act is utilized to resolve the conflict (Humboldt County 2014).

Humboldt County Humboldt Bay Area Plan

The Project Site is primarily included in the area subject to the HBAP, a component of the Humboldt County Local Coastal Program. The area east of Vance Avenue is designated Coastal Dependent Industrial (MC). Coastal Dependent Industrial use types are allowable uses under the MC land use designation applicable to the Project Site. The Humboldt County zoning designation for the parcels comprising the Project Site is Industrial/Coastal Dependent (MC) and includes an 'Archaeological Resource Area Outside Shelter Cove combining zone overlay (A)'. The combining zone (A) designates the Project Site as an area potentially containing archaeological resources and provides for "reasonable mitigation measures where development would have an adverse impact upon archaeological and paleontological resources" (HCC 313-16.1). A review of the HBAP (Local Coastal Plan) policies and narrative suggest that there is general consistencies and direction contained in the HBAP regarding Coastal-dependent Industrial uses that supports the development of the Proposed Project on the Proposed Project site. [Note: As depicted on Figure 4, while the vast majority of the upland site is zoned MC/A, there are small areas along the western edges of the Upland Development Subarea consisting of railroad right-of-way, roads and adjacent habitat, designated/zoned MG (Industrial General), CR (Commercial recreation), NR/W,B (Natural Resources/Coastal Wetland Areas/Beach and Dune Areas); and PF/D (Public Facility/Design Review)].

A. PLANNED USES (p3-10)

Outside of urban limit lines, coastal dependent developments are proposed in several rural areas. An extensive area of coastal dependent industrial development is located along the North Spit south of the Samoa Bridge and east of New Navy Base Road.

The proposed use is principally permitted:

B. DEVELOPMENT POLICIES 3-11

1. Industrial:

a. within areas designated Coastal Dependent Industrial (MC), the principal uses shall be any coastal-dependent industrial use that requires access to a maintained navigable channel in order to function, including, but not limited to: … water-borne carrier import and export operations…

The following HBAP section supports the proposed uses on the Proposed Project site:

3.14 Industrial

A. PLANNED USES

Planned uses at sites along maintained dredged channels are designed to accommodate port-related activities that can take advantage of the Bay's transportation resources such as dry cargo facilities, aquaculture facilities, OCS facilities, commercial fishing facilities, and electrical power plants.

The North Spit south of the Samoa Bridge is the site of the County's heaviest industrial uses, specifically the two pulp mills of Louisiana-Pacific and Crown-Simpson. These areas are planned Coastal Dependent Industrial because of the water-borne traffic which constitutes an integral part of these operations.

> In regard to amendments pursuant to Section 30515 of the Coastal Act, it should be noted that the public needs of the nation were considered in developing the land use designations of this plan which could accommodate oil and gas development; and, that the public needs within the area of the Humboldt Division of P.G.& E. were considered in developing the land use designations and recommendations with respect to power plant siting.

The following HBAP policy supports the proposed uses on the project site would be consistent with the intent for Coastal-dependent industrial uses and would be defined as a Priority 1 Site.

> B. DEVELOPMENT POLICIES
>
> 3. COASTAL DEPENDENT INDUSTRIAL
>
> Coastal-dependent industrial facilities shall be encouraged to locate or expand within existing sites and shall be permitted reasonable long-term growth where consistent with this division. However, where new or expanded coastal-dependent industrial facilities cannot feasibly be accommodated consistent with other policies of this division, they may nonetheless be permitted in accordance with this section and Sections 30261 and 31262 if (1) alternative locations are unfeasible or more environmentally damaging; (2) to do otherwise would adversely affect the public welfare; and (3) adverse environmental effects are mitigated to the maximum extent feasible.
>
> a. The initial study and subsequent environmental review of a proposed coastal dependent or coastal related facility shall include consideration of alternative sites within appropriate land use designations for the Proposed Project, and shall rate the sites according to the following priority:
>
> Priority 1 Sites: sites with existing facilities suitable, with minor alteration, to accommodate the proposed use, or that could accommodate the proposed use through expansion.

The HBAP identifies an Urban Limit Line on the Samoa Peninsula as consisting of the town of Samoa, with the Urban Limit Line coterminous with the Samoa Town Master Plan (STMP) boundary. Extension of wastewater services outside of the Urban Limit Line is prohibited by the HBAP, except sewer connections provided to industrial uses. The project site is listed as being located outside of the urban limit lines, even though all utilities have been and are available on the project site. Most of the Project Area is outside the Urban Limit Line but is completely an industrial use site.

So, while the project can be found to be consistent with the coastal-dependent industrial policies of the HBAP, it is recognized that there is conflicting language in relationship to other coastal act policies that are addressed in the HBAP and with other current uses including natural resources, viewsheds, and recreation. The area designated Natural Resources (NR) by Humboldt County is within the HBHRCD primary regulatory jurisdiction and is contrary to the purposes of the tidelands granted in 1970 to HBHRCD by the California State Lands Commission.

HBAP Coastal Zoning: MC

Zoning designations in the project area have been developed based on the HBAP with combining zones and the STMP Land Use Plan designation overlay for the area associated with the Project Area. Review of the associated zoning (Humboldt County Code, Zoning Regulations, Title III Land Use Development) for parcels within the project area designate the following zoning, which is provided below with a brief synopsis of allowable uses:

MC-A; industrial/ coastal dependent with an Archaeological Resource Area overlay: These parcels have been historically used for industrial coastal development and include some residential uses (Humboldt County Code, Title III, Division 1, Section 313-3.4 and 313-16.1). These zoning designations are primarily found along the Humboldt Bay waterfront parcels including Finntown (approximately 10 homes) and properties along Vance Avenue north toward the community of

Samoa and south along New Navy Base Road to the U.S. Coast Guard facility. Some of the parcels farther to the south in areas of limited historic development also have an combining zone designation of "W" (MC-A,W) which designates Coastal Wetlands.

Section 313-3.4 (11/8/2022 version) regulates development in the MC: Industrial;/Coastal Dependent Zone. This zone allows Coastal-Dependent Industrial Use types, subject to the Coastal-Dependent Industrial Development Regulations listed in 313-104.1 and the Industrial Performance Standards listed in Section 313-103.1

Principally permitted uses include Coastal Dependent Industrial Use Types.

Conditionally permitted Uses include Heavy Industrial uses, limited to alteration, improvement, and relocation of existing facilities, interim Conditionally Permitted Use Type, and Heavy Industrial uses.

Development standards from 313-3.4

- Lot Area - minimum Lot Area of 10,000 sf,
- Lot configuration – None Specified
- Lot Setbacks – as designated by the Development Standards Combining Zone = none
- Maximum Structure Height – 50 feet high to a maximum 75 feet high based on distance from front yard setback
- Permitted Main Building Types – Nonresidential Detached or Multiple/Group

313-103.1 Industrial Performance Standards

The County Industrial Performance Standards apply to operations and not construction and are divided up into areas that impact Residential zones (103.1.3) and those that impact Non-residential zones (103.1.4). Portions of the Project area would be subject to one or the other or both.

The problematic standards for either Residential and Non-residential include Noise (70 dBA, except limit of 5 dBA above ambient at adjacent residences), Lighting (shielded for residential areas), Vibrations (no operational allowed), Dust Control (requires concrete paving in residentially impacts areas), and the requirement for all manufacturing to be enclosed in buildings. These can be modified by the Hearing Officer during the Use Permit process, but new minimum performance standards need to be set.

HBAP Coastal Zoning: NR-W

NR; Natural Resources: These areas are designated natural resource areas, such as the Samoa Recreation Area and areas along the Humboldt Bay and Pacific coast. Some areas have further combining zone designations of "W" (Coastal Wetlands, NR-W).

Section 313-5.4 NR-Natural Resources would not allow uses proposed by the Proposed Project except for the proposed eel grass mitigation, processed under a separate application. Under the Development standards, the maximum height is 35 feet. The -W (wetlands) Combining Zone Designation, as described in Section 313-38, states that these regulations apply in addition to the regulations imposed by the principal zone.

However, Section 38.1.5 allows Diking, Filling, and Dredging for boat facilities, Entrance Channels for expanded boating, and Coastal Dependent Industrial Use Types, none of which are mentioned under the principal zone of NR.

The area zoned NR-W by Humboldt County is within the HBHRCD primary regulatory jurisdiction and the zoning is contrary to the purposes of the tidelands granted in 1970 to HBHRCD by the California State Lands Commission.

Natural Areas

In addition to Humboldt Bay natural areas, there are a variety of local, state, and special district protected areas exist in the Plan Area, including the Humboldt Bay National Wildlife Refuge, and the wildlife area on Woodley Island (Harbor District). These areas include some form of public or private habitat protection or otherwise designated open space. The Proposed Project is within the Primary Area of Concern and Sphere of Interest boundary components of the HBMP planning boundary, which guides planning, research and use around Humboldt Bay. In addition, the Humboldt Bay National Wildlife Refuge owns tidelands, including saltmarsh and mudflat, in Arcata Bay and in South Bay within or adjacent to the Proposed Project area. A cluster of salt marsh restoration (SMR) sites are proposed within the Humboldt Bay National Wildlife Refuge in the South Bay portion of the Proposed Project area where dredge sediments may be placed, as analyzed in the ICF 2020 EIR, where SMR could occur to provide valuable habitat, independent of protecting vital shoreline infrastructure (ICF 2020).

Regulatory Setting

Some applicable local regulations that are relevant to an analysis of the Proposed Project's land use impacts are listed below.

Federal

Coastal Zone Management Act and Coastal Zone Management Program

The Coastal Zone Management Act (CZMA) was enacted in 1972 to provide direction to state governments regarding protection of the Nation's coastal zone. As a result of the implementation of the CZMA, the Coastal Zone Management Program (CZMP) was established to develop programs and responsibilities for developing the Nation's coastal communities and resources. In California, the CZMA, and related programs identified under the CZMP, are administered by the California Coastal Commission.

State

State Planning and Zoning Laws

California Government Code Section 65300 et seq. establishes the obligation of cities and counties to adopt and implement general plans. The general plan is a comprehensive, long-term, and general document that describes plans for the physical development of a city or county and of any land outside its boundaries that, in the city's or county's judgment, bears relation to its planning. Cities typically identify a "sphere of influence" in their general plans; these are areas outside the city corporate boundaries that comprise the probable future boundary and service area of the city. The general plan addresses a broad range of topics, including at a minimum land use, circulation, housing, conservation, open space, noise, and safety. In addressing these topics, the general plan identifies the goals, objectives, policies, principles, standards, and plan proposals that support the city's or county's vision for the area. The State Zoning Law (California Government Code § 65800 et seq.) establishes that zoning ordinances, which are laws that define allowable land uses within a

specific zone district, are required to be consistent with the general plan. Local general plan policies and zoning ordinances, as they relate to the Proposed Project, are summarized in the forthcoming sections (ICF 2020).

California Coastal Act

The California Coastal Act (CCA) was enacted to establish policies and guidelines that provide direction for the conservation and development of the California coastline. The California Coastal Commission (CCC) was established by voter initiative via Proposition 20 in partnership with coastal cities and counties in order to plan and regulate the use of land and water within the Coastal Zone. The CCC requires that each coastal jurisdiction prepare a Local Coastal Program (LCP), including a coastal land use plan. The LCP is developed by each municipality for their jurisdiction that falls within the coastal zone. The LCP also includes zoning ordinances and zoning district maps, and, where required by the coastal land use plan, other applicable implementation measures. Once the LCP is reviewed and certified by the local government and the CCC as consistent with the Coastal Act's policies, the LCP becomes the guiding and regulatory document for development and resource conservation in the coastal zone. Humboldt County has adopted six coastal planning areas that function as LCPs (ICF 2020).

Article 4 of the California Coastal Act requires that marine resources be maintained, enhanced, and where feasible, restored. The act also requires that special protection be given to areas and species of special biological or economic significance. It further requires that uses of marine environments be such that habitat function, biological productivity, healthy species populations, and fishing and recreational interests of coastal waters are maintained for long-term commercial, recreational, scientific, and educational purposes; and that marine resources are protected against the spillage of crude oil, gas, petroleum products, and hazardous substances (ICF 2020).

The CCC, in concert with the Harbor District and coastal cities and counties, is responsible for the planning of land and water uses within the coastal zone, and the regulation of proposed development activities. The Coastal Commission is the State's designated coastal management agency for the Pacific Coast in Humboldt County, and administers the federal CZMA. The Coastal Act provides that coastal-dependent developments, including coastal dependent industry (CDI), coastal-related developments, and coastal recreation uses, shall have priority over other developments on or near the shoreline.

Local

Humboldt Bay Management Plan

The HBHRCD is successor to the State's interest in tide and submerged lands in Humboldt Bay area pursuant to Chapter 1283, Statutes of 1970, as amended. This includes former tidelands that were part of a settlement agreement in1982. In order to efficiently balance the variety of uses in Humboldt Bay, the State of California established the HBHRCD (District) in 1970. The enabling legislation may be found in the California Harbors and Navigation Code, Appendix II. The statutory purpose of the District is to manage Humboldt Bay for the promotion of commerce, navigation, fisheries, recreation, and the protection of natural resources, and to acquire, construct, maintain, operate, develop, and regulate harbor works. The important point in this statement of purposes is the balance among potentially conflicting uses of Humboldt Bay, which the District continually strives to achieve, and which the Humboldt Bay Management Plan is intended to facilitate. The District has regulatory jurisdiction over all of the tide and submerged lands of Humboldt Bay.

Therefore, the District exercises development authority over every development project proposed in Humboldt Bay; in many cases the District is also the lead agency for compliance with the requirements of the California Environmental Quality Act (CEQA; HBMP 2007).

The HBMP was first developed in 1997 to provide an update and development of a common database for use by the Bay's landowners and agency land managers to guide planning, research and use around Humboldt Bay. The HBMP planning boundary consists of three components: the Primary Area of Concern, the Sphere of Interest, and the Humboldt Bay Watershed. The Proposed Project occurs within the Primary Area of Concern and Sphere of Interest boundary components. The HBMP also provides water use classification types, which include primary water use and combined water use designations. The primary water use designations are harbor and bay conservation. The combined water use designations are marine recreation and mariculture (ICF 2020).

Section three of the HBMP is the policy document of the plan and sets forth the Harbor Element Planning Policies, Recreation Planning Policies, and Conservation Element Planning Policies. Policies from the Harbor Element and Conservation Element are most applicable to the Proposed Project; these policies are listed below (ICF 2020).

Harbor Element Planning Policies

Shoreline Management

Goals

- Maintain shipping terminals, marinas, and related shoreside facilities within Humboldt Bay that support commercial shipping and other water dependent or coastal-dependent uses.
- Maintain shoreline protection measures that protect uplands from encroachment by the Bay while protecting the Bay from the effects of upland uses.

The following Shoreline Management policies from the Harbor Element are applicable to the Proposed Project.

- **HSM-3:** Develop appropriate, consistent shoreline protection guidelines for commercial, industrial, and residential development around Humboldt Bay.
- **HSM-4:** Require maintenance according to the District's adopted shoreline protection standards.
- **HSM-7:** Identify needs for potential shoreline improvements necessary to accommodate bay water surface elevation changes, including potential effects of climate change.
- **HSM-8:** Develop coordinated plan for addressing seismic effects, land stability, and tsunami response plan for Humboldt Bay.

Dredging and Waterway Maintenance

Goals

- Maintain Humboldt Bay's channels to be compatible with the requirements of commercial shipping and other water-dependent uses of the Bay.
- Conduct channel maintenance dredging that is compatible with maintaining environmental resource values in Humboldt Bay

The following Dredging and Waterway Maintenance policies from the Harbor Element are applicable to the Proposed Project:

- **HWM-2:** Dredging may be authorized to meet Plan purposes.
- **HWM-3:** Re-deposition of dredged materials within Humboldt Bay may be authorized to meet Plan purposes.
- **HWM-4:** Placement of fill within Humboldt Bay may be authorized to meet Plan purposes.
- **HWM-5:** Potential dredged-material management options and alternative disposal methods will be identified in a Long-Term Management Strategy for Humboldt Bay.
- **HWM-6:** Sediment dynamics in Humboldt Bay will be identified and a sediment management approach for Humboldt Bay will be developed.
- **HWM-7:** Evaluate the extent of maintenance dredging required to meet the Management Plan's objectives.
- **HWM-8:** Evaluate channel maintenance alternatives for the community of King Salmon.

Conservation Element Planning Policies

Aquatic Species Management

Goals

- Manage Humboldt Bay and its habitats to maintain viable populations of native and desirable nonnative species.

The following Aquatic Species Management policies from the Harbor Element are applicable to the Proposed Project:

- **CAS-5:** Fill placement may be used for habitat enhancement purposes.
- **CAS-6:** Fill Placement may be used for cultural resource protection purposes.

Humboldt Bay Ecosystem Management Program Elements

Goals

Provide standards for reviewing District projects and submittals for District approvals that protect the Bay's ecosystem components while authorizing appropriate uses.

The following Humboldt Bay Ecosystem Management Program policies from the Harbor Element are applicable to the Proposed Project.

- **CEP-2:** Dredging may be approved under specified conditions.
- **CEP-4:** Functional capacity of aquatic ecosystems must be maintained.
- **CEP-5:** Water quality protection is required.

Humboldt County General Plan

The Humboldt County General Plan (HCGP) includes goals, policies, and standards for land uses throughout the County. However, the project area is located within the coastal zone, which has specific management direction provided in the HBAP. A part of the General Plan, the HBAP sets land use and zoning requirements for lands in the project area.

The HCGP was adopted on October 23, 2017. The HCGP establishes land use designations to allow for the orderly development of lands within the County. The HCGP provides residential, commercial, industrial, open space, public lands and tribal lands, and resource production designations. In addition, the HCGP Appendix E includes six LCPs, in compliance with the CCC. The Land Use Element contains policies related to land use that are relevant to the Proposed Project (ICF 2020).

Land Use Element

The HCGP Land Use Element contains goals, policies, and programs concerning land use; many of the issues and policies contained in other plan elements are linked in some degree to this element. The policies in the Land Use Element address countywide issues that are general in nature and may apply to numerous locations and land use designations within the planning area. The policies are grouped by topic and are preceded by a brief discussion of issues pertaining to the topic. The following is a summary of the policies included in the Land Use Element within specific subcategories that apply to the Proposed Project (ICF 2020).

Public Lands

Policy PL-P1: Management Plans. Encourage applicable public land agencies to prepare management plans that:

- Ensure consistency with the General Plan; and
- Promote and protect adjacent private resource production lands; and
- Effectively utilize the multiple-use concept; and
- Emphasize the provision of low-cost recreational opportunities, provided such opportunities do not unfairly compete with private enterprise; and
- Place priority on development and maintenance of facilities over future acquisition; and
- Maximize local employment

Policy PL-P6: Planning Adjacent to Public Lands. Land use planning and discretionary review of permit and subdivision applications adjacent to public lands will consider impacts on public lands and consistency with applicable management plans.

Policy PL-P7: Public Access. Encourage the provision of the maximum amount of access to public lands and waterways, consistent with: A. Public safety; B. Consideration of nearby access alternatives; C. Rights of private property owners; D. Natural resource protection; E. Subdivision Map Act requirements for access to navigable waterways; and F. Special needs of handicap and elderly persons.

Land Use Designations

The HCGP Land Use Element contains the various land use designations and their permitted uses that are also displayed on the Plan's land use maps. The Proposed Project's applicable land use designations are listed below.

Industrial Designations

Industrial, General (MG): This designation (IG in inland areas; MG in coastal areas) provides for general industrial and manufacturing uses, typically in urban areas, convenient access to

transportation systems and full range of urban services are available. This designation may be accommodated in rural areas where full urban services are not required for the intended use.

Industrial, Resource Related (IR): This designation provides areas for resource-related industrial processing such as timber, agriculture and mineral products processing in areas not typically served by urban services and therefore not suitable for a broader range of industrial uses.

Industrial, Coastal Dependent (MC): The purpose of this designation is to protect and reserve parcels on, or near, the sea for industrial uses dependent on, or related to, the harbor.

Open Space, Public Lands, and Tribal Land Designations

Natural Resources (NR): The purpose of this designation is to protect and enhance valuable coastal fish and wildlife habitats and provide for public and private use of their resources, including hunting, fishing, and other forms of recreation.

Open Space (OS): This designation provides for land which is essentially unimproved and devoted to open space use, including areas for conservation of natural resources and habitat values, for protection of public health and safety such as areas subject to flooding, steep or unstable slopes, and for compatible outdoor recreational uses such as accessways and trails and scenic enjoyment.

Public Facility (PF): The Public Facilities designation is utilized to classify land appropriate for use by a governmental agency or public agency, which has the purpose of serving the public health, safety, convenience, or welfare.

Public Lands (P): The Public Lands designation is used to classify land owned by or under the jurisdiction of the federal, state, county or any other district authority or public corporation, or agency thereof.

Resource Dependent (MR): The purpose of this designation is to protect coastal wetlands and to provide for the development of upland areas consistent with resource protection, and where feasible, resource enhancement.

Resource Production Land Use Designations

Agricultural Exclusive (AE): This designation applies to bottomland farms and lands that can be irrigated; also used in upland areas to retain agricultural character. Typical uses include dairy, row crops, orchards, specialty agriculture, and horticulture (ICF 2020).

Humboldt County Local Coastal Program (HCLCP)

Humboldt County's LCPs in concert with Chapter One through Three of the Humboldt County Zoning Code, comprise the certified Humboldt County LCP. The HCLCP that is applicable to the Proposed Project is the Humboldt Bay Area Plan(HBAP). The HBAP was developed by the Humboldt County Planning Department as required by the CCA of 1976, and under provisions of the CZMA administered by the CCC. Originally completed and certified in 1982, the HBAP has been revised over the years with the most recent update of March 2022. A part of the General Plan, the HBAP identifies land uses and standards by which development is evaluated by the County in the Coastal Zone. The HBAP outlines specific land use development polices and zoning designations within the Coastal Zone and provides guidance and specific direction for land use activities.

The HBAP contains policies, recommendations, and standards that are based on the Coastal Land Use Policies and Standards (CLUPS) that were approved by the Humboldt County Board of

Supervisors on September 18, 1979. The HBAP's Natural Resources Protection Policies and Standards detail the provisions applicable to the diking, filling, and dredging components of the Proposed Project:

The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes will be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and will be limited to the following:

- New or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities.
- Maintaining existing, or restoring previously dredged, depths in existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps.
- In wetland areas only, entrance channels for new or expanded boating facilities; and in a degraded wetland, identified by the Department of Fish and Game pursuant to subdivision (b) of Section 30411, for boating facilities if, in conjunction with such boating facilities, a substantial portion of the degraded wetland is restored and maintained as a biologically productive wetland; provided; however, that in no event will the size of the wetland area used for such boating facility, including berthing space, turning basins, necessary navigation channels, and any necessary support service facilities, be greater than 25 percent of the total wetland area to be restored.
- In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities.
- Incidental public service purposes, including, but not limited to, burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines.
- Mineral extraction, including sand for restoring beaches, except in environmentally sensitive areas.
- Restoration purposes.
- Nature study, aquaculture, or similar resource-dependent activities (ICF 2020).

For development of the Proposed Project, specific land use and zoning areas and their descriptions have been outlined above in Section 3.1.1.3, Setting, subsection Land Use Designation and Zoning.

Samoa Town Master Plan (STMP)

The STMP and related EIR were developed by the County and the Samoa Pacific Group, LLC, who purchased the town of Samoa in 2000, to provide updated land use framework for ongoing uses in the town of Samoa. The goal of the STMP was to maintain the historical character of the town of Samoa, including its architecture and linkages to the ocean and bay. The STMP also provides consistency findings and an opportunity for revisions or modifications to the HBAP through the LCP. The STMP was incorporated into the HBAP in 2022, establishing an overlay zone and applicable policies for a 33-acre portion of the Project Site. Some of these were enumerated in the Coastal Commissions August 25, 2023 response to the Project's Notice of Preparation Attachment 1, indicating conflicts with the Project.

Peninsula Community Services District

The Peninsula Community Services District (PCSD) provides services to a mix of residential, commercial, industrial coastal development, public facilities, parks and a school on the Samoa peninsula. The service area for providing services, including wastewater treatment, covers a large portion of the peninsula and includes the unincorporated communities of the town of Samoa, Fairhaven, and Finntown and the Project Site. Ongoing maintenance and operations of services required by the Project would be provided by the PCSD.

Discussion

a. Physically divide an established community?

The Project does not propose anything that would physically divide a community and therefore the potential for affected resources at the Project may be less than significant.

More operational information in the project description will be needed to determine whether the waterborne part of the project affects navigation of other commercial and recreational users such that it 'divides' current uses and affects existing land uses. This issue will be further addressed in the Transportation section of the EIR.

b. Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

There is a conflict within overlapping land use management policies and resource agency procedures applicable at the Project site primarily pertaining to balancing the coastal-dependent industrial use of the Project with the resource protection policies for habitat areas surrounding the Project. Some of these conflicts would be resolved through the EIR process and permitting through the resource agencies. However, there remains a potential environmental impact due to a conflict with land use plans, policies and regulations adopted for the purpose of avoiding or mitigating an environmental effect because this type of use was not anticipated in those regulations and may exceed some of the standards. Particular HBAP policies that may conflict with the Project include (1) allowance of ESHA impacts with mitigation; (2) noise levels; (3) visual screening; and (4) a requirement to conduct manufacturing activities inside of structures.

References Cited

Printed References

Humboldt County. 2014. Humboldt County General Plan Volume II, Humboldt Bay Area Plan of the Humboldt County Local Coastal Program. December.

Humboldt County. 2019. Samoa Peninsula Wastewater Project EIR. Website: https://humboldtgov.org/DocumentCenter/View/89551/Samoa-Peninsula-Wastewater-Project-Final-EIR-Response-to-Comments-PDF. Accessed March 20, 2024.

Humboldt Bay Harbor Recreation and Conservation District (HBHRCD). 2007. Humboldt Bay Management Plan 2007.

ICF. 2020. Draft Program Environmental Impact Report for Humboldt Bay Sediment Management. November. (ICF 00638.17.) Los Angeles, California. Prepared for Humboldt Bay Harbor, Humboldt, California.

XII. Mineral Resources

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:					
a.	Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b.	Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	☒

Affected Environment

Mineral extraction activities in Humboldt County are limited to primarily aggregate and quarry rock; either from instream mining or from quarrying outcrops. There are no mining operations in the Project Area. Construction of the Project would not result in the loss of a known mineral resource or availability of any locally important mineral resource recovery sites identified in the Humboldt County General Plan. Geologic investigations have shown no mineral resources within the Project Area. Neither the County of Humboldt General Plan (Humboldt County 2017) nor Humboldt Bay Area Plan (HBAP; Humboldt County 2022). designate the Project Site as having a known mineral resource of value. Humboldt County has not yet been included in the California Mineral Land Classification System by the State Mining and Geology Board to designate lands containing mineral deposits of regional or statewide significance.

The project will require a supply of aggregate materials during construction activities. Both instream gravels and quarry rock are available within relative proximity to the Project Site. While local supplies may be limited, there are readily available sources outside the area (such as British Columbia) that could be barged to the Project Site.

Regulatory Setting

Federal Regulations

There are no federal regulations related to mineral resources that are applicable to the proposed Project.

State Regulations

Surface Mining and Reclamation Act of 1975

The State of California has recognized that mineral resources are essential to the needs of society and the economic well-being of the state. In 1975, the State Legislature passed the Surface Mining and Reclamation Act (SMARA), Public Resources Code (PRC) Section 2710, et seq. The intent of SMARA is to promote production and conservation of mineral resources, minimize the environmental effects of mining, and ensure mined lands are reclaimed to conditions suitable for

alternative uses. Reclaiming land for other uses once mining operations are completed is important for the general health, safety and welfare of the community. Under SMARA, permits are required for all mining activities commencing operation on or after January 1, 1976. All cities and counties in California must incorporate such designated mineral resource zones into their general plans.

Mineral Resources and Mineral Hazards Mapping Program

California's Mineral Resources and Mineral Hazards Mapping Program (MRMHMP) provides data about nonfuel mineral resources, naturally occurring mineral hazards (such as asbestos, radon, and mercury), and historic mining activities throughout the state. The MRMHMP is divided into two projects; the Mineral Resources Project, which provides information about California's nonfuel mineral resources, and the Mineral Hazards Project, which maps and monitors minerals related to public health and safety concerns.

Local and Regional Regulations

SMARA Ordinance

Humboldt County Ordinance No. 2117 implements SMARA and addresses the importance of mineral extraction to the economic well-being of Humboldt County. It regulates all surface mining operations in the unincorporated portions of Humboldt County, as authorized by SMARA. This ordinance is intended to ensure the conservation of mineral resources that may be within the Project Area that currently is under the jurisdiction of Humboldt County.

Discussion

a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

Based on information contained in Section VII Geology and Soils, there are no mineral resources of value to the region that would be lost due to the Project. None exist under or adjacent to the Site.

b. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?

Implementation of the Proposed Project would not result in the loss of availability of a known mineral resource, nor in the loss of a locally important mineral resource recovery site as delineated by Humboldt County's General Plan or other planning or policy document.

References Cited

Printed References

Humboldt County 2017. Humboldt County General Plan. Available at: https://humboldtgov.org/205/General-Plan

Humboldt County 2022. Humboldt Bay Area Plan of the Humboldt County Local Coastal Program. Available at: https://humboldtgov.org/DocumentCenter/View/50844/Humboldt-Bay-Area-Local-Coastal-Plan?bidId=

XIII. Noise

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:					
a.	Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies?	☒	☐	☐	☐
b.	Generate excessive groundborne vibration or groundborne noise levels?	☒	☐	☐	☐
c.	Be located within the vicinity of a private airstrip or an airport land use plan, or, where such a plan has not been adopted, within two miles of a public airport or public use airport and expose people residing or working in the project area to excessive noise levels?	☒	☐	☐	☐

Affected Environment

This section describes the regulatory and environmental setting for noise in the Proposed project area. The noise study area includes all land within 0.5 mile of upland and marine development areas and wind turbine device tow routes in the Proposed Project area.

Noise Sources in the Proposed Project Area

The Proposed Project area would potentially result in increases in ambient noise in parts of unincorporated Humboldt County, primarily on the Samoa peninsula, and in the city of Eureka. Existing noise sources in the Proposed Project area include traffic from US-101 and local roads, and aircraft overflights from Humboldt County Airport, Murray Airport, and the Samoa airstrip. There are several industrial and marine oriented businesses along the shoreline of Samoa peninsula and Eureka facing the Proposed Project area. Noise emissions from vessels and channel maintenance dredging intermittently contribute to ambient levels along the shoreline of Humboldt Bay. The Proposed Project area includes urban, suburban, and partially developed rural environments, with ambient sound levels typically within a range of 45 to 60 (dBA).

Surrounding Noise-Sensitive Land Uses

Sensitive land uses are generally defined as locations where people reside or where the presence of noise could adversely affect the use of the land. Sensitive land uses that would potentially be affected by noise from the Proposed Project include single- and multi-family residences, lodging and recreational uses within 500 feet of shoreline areas of Humboldt Bay.

Regulatory Setting

Applicable federal, state, and local noise regulations are described in this section.

Federal

Noise Control Act of 1972

The Noise Control Act of 1972 (Public Law 92 574) established a requirement for all federal agencies to administer their programs in a manner that promotes an environment that is free of noise that jeopardizes public health or welfare. The U.S. Environmental Protection Agency (USEPA) was given the following responsibilities.

- Providing information to the public regarding the identifiable effects of noise on public health and welfare.
- Publishing information on the levels of environmental noise to protect public health and welfare with an adequate margin of safety.
- Coordinating federal research and activities related to noise control.
- Establishing federal noise emission standards for selected products distributed in interstate commerce.

Federal Transit Administration Construction Noise Standards

The Federal Transit Administration (FTA) has developed methods for evaluating construction noise levels, which are discussed in the FTA *Transit Noise and Vibration Impact Assessment Manual* (Federal Transit Administration 2018). The manual does not contain standardized criteria for assessing construction noise impacts but provides guidelines for suggested noise limits for residential uses exposed to construction noise to describe levels that may result in a negative community reaction. These guidelines are summarized in Table T.

Table T. Federal Transit Administration Construction Noise Impact Guidelines

Land Use	8-hour Leq (dBA), Day	8-hour Leq (dBA), Night
Residential	80	70
Commercial	85	85
Industrial	90	90

Source: Federal Transit Administration 2018.
dBA = A-weighted decibel; Leq = equivalent continuous sound level.

Thresholds for construction noise may be set at the local level according to expected hours of equipment operation and the noise limits specified in the noise ordinances of the applicable jurisdictions.

State

California Department of Transportation Vibration Standards

The California Department of Transportation (Caltrans) provides guidelines regarding vibration associated with construction and operation of transportation infrastructure. Table U provides the Caltrans vibration guidelines for potential damage to different types of structures.

Groundborne vibration and noise can also disturb people. Numerous studies have been conducted to characterize the human response to vibration. In general, people are more sensitive to vibration during nighttime hours when sleeping than during daytime waking hours. Table U provides the

Caltrans guidelines regarding vibration annoyance potential (expressed here as peak particle velocity [PPV]).

Table U. Caltrans Guidelines for Vibration Potential Damage to Structures

	Maximum PPV (in/sec)	
Structure Type and Condition	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Source: California Department of Transportation 2020:Table 19.
Note: Transient sources create a single, isolated vibration event (e.g., blasting or the use of drop balls). Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.
PPV = peak particle velocity.

Table V. Caltrans Guidelines for Vibration Annoyance Potential

	Maximum PPV (in/sec)	
Human Response	Transient Sources	Continuous/Frequent Intermittent Sources
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.9	0.10
Severe	2.0	0.4

Source: California Department of Transportation 2020:Table 20.
Note: Transient sources create a single, isolated vibration event (e.g., blasting or drop balls). Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.
PPV = peak particle velocity.

Local

Humboldt County

Humboldt County General Plan

The Noise Element of the County General Plan Update, adopted in 2017, contains policies related to the control of excessive noise and the compatibility of land uses with various noise environments. The General Plan includes goals, policies, and standards to control noise from stationary and mobile sources and implement land use planning measures. Policies in the Noise Element relevant to the Proposed Project are as follows.

> **N-P1.** Minimize Noise from Stationary and Mobile Sources. Minimize stationary noise sources and noise emanating from temporary activities by applying appropriate standards for average and short-term noise levels during permit review and subsequent monitoring.

N-P4. Protection from Excessive Noise. Protect persons from existing or future excessive levels of noise which interfere with sleep, communication, relaxation, health or legally permitted use of property.

The General Plan includes performance standards for short-term noise in standard N-S7. For residential use, maximum permissible short-term noise standards are indicated as 65 dBA during the hours of 6:00 a.m. to 10:00 p.m., and 60 dBA from 10:00 p.m. to 6:00 a.m. The short-term noise standards do not apply to the use of heavy equipment and power tools used during construction of permitted structures when conforming to the terms of the approved permit.

City of Eureka

Eureka General Plan

The Eureka 2040 General Plan, adopted in 2018, includes a Noise Element that includes policies for noise control in the city. Goal N-1 of the Noise Element of the General Plan is to promote "economic vitality while limiting residential and business exposure to harmful noise and vibrations." Policies related to this Proposed Project are stated in the General Plan as follows.

N-1-5. New Stationary Noise Sources. Require new stationary noise sources to mitigate noise impacts on noise-sensitive uses in which exterior level noises exceed noise compatibility standards.

N-1.13. Construction Noise. Minimize construction-related noise and vibration by limiting construction activities within 500 ft of noise-sensitive uses to between 7:00 a.m. to 7:00 p.m., unless further restricted through permitting.

N-1.14. Vibration. Require an assessment of vibration-induced construction activities and development near highways and rail lines, in close proximity to historic buildings and archaeological sites, to ensure no damage occurs.

The Proposed Project would potentially result in increases in ambient noise in parts of unincorporated Humboldt County, primarily on the Samoa peninsula, and the city of Eureka. Existing noise sources in The Proposed Project area include traffic from US-101 and local roads, and aircraft overflights from Humboldt County Airport, Murray Airport, and the Samoa airstrip. There are several industrial and marine oriented businesses along the shoreline of Samoa peninsula and Eureka facing the Proposed Project area. Noise emissions from vessels and channel maintenance dredging intermittently contribute to ambient levels along the shoreline of Humboldt Bay. The Proposed Project area includes urban, suburban, and partially developed rural environments, with ambient sound levels typically within a range of 45 to 60 (dBA).

Discussion

a. Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies?

The EIR will evaluate the noise generated by construction and operation of the proposed project and compare those levels to local standards. Existing noise levels will be considered in the evaluation.

b. Generate excessive groundborne vibration or groundborne noise levels?

The EIR will evaluate vibration from construction and operation, and identify specific impacts on receptors, and sensitive structures.

c. Be located within the vicinity of a private airstrip or an airport land use plan, or, where such a plan has not been adopted, within two miles of a public airport or public use airport and expose people residing or working in the project area to excessive noise levels?

The EIR will evaluate noise effects from nearby airports to people working at the project site.

References Cited

Printed References

California Department of Transportation. 2020. Caltrans Vibration Guidelines for Damage and Annoyance.

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Federal Transit Administration. 2018.

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XIV. Population and Housing

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:					
a.	Induce substantial unplanned population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?	☒	☐	☐	☐
b.	Displace a substantial number of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☒	☐

Affected Environment

The Samoa Peninsula is a sparsely populated narrow coastal landform, known as a "spit", which forms a barrier between the Pacific Ocean and Humboldt Bay. Connected to the mainland on the northern end, it is accessible from the City of Arcata, which is located at the north end of Humboldt Bay. On the south, the spit is open to the navigation channel that allows access from the Pacific Ocean to Humboldt Bay.

The Project Site and surrounding area is an overwhelmingly industrial area. The Upland Development Subarea is accessed by existing roadways and has had industrial land uses for at least 70 years. The Project Area is designated MC-Industrial/Coastal Development and NR-Natural Resources by the Humboldt Bay Area Plan (the Local Coastal Program that is included in the General Plan for coastal areas) and is not designated as an area for residential development. There is no existing housing on the Project Site and it is not listed in the Regional Housing Needs Assessment (RHNA) Land Inventory. This means that the Project Site has not been identified as suitable for housing development.

The nearest residential communities are the Town of Samoa and Phyllis Rex Samoa Townhomes located immediately west of the Project Site. Fairhaven and Finntown are located approximately 1.3 miles to the southwest. Existing surrounding land uses are a mixture of residential, commercial, industrial, and public facilities. Residential uses are generally concentrated in the unincorporated communities of Samoa, Finntown, and Fairhaven, which predominately have single-family residences with some multi-family developments (such as the adjacent Phyllis Rex Samoa Townhomes). Large industrial uses exist between these residential areas. Commercial services are minimal, with the most prominent being the Samoa Cookhouse restaurant. (Humboldt County. 2019).

The town of Samoa has a population of 258 people. The Samoa Town Master Plan (STMP) and related EIR were developed by the County and the Samoa Pacific Group, LLC, who purchased the town of Samoa in 2000, to provide updated land use framework for ongoing uses in the town of Samoa. The goal of the STMP was to maintain the historical character of the town of Samoa, including its architecture and linkages to the ocean and bay. The STMP also provides consistency findings and an opportunity for revisions or modifications to the HBAP through the LCP. The STMP

was incorporated into the HBAP in 2022, establishing an overlay zone and applicable The STMP includes providing 198 new residential units, including a residential district west of Vance Avenue; Live/work studios along Cadman Court and; 80 new workforce housing units east of Vance Avenue and north of Soule Street.

The community of Fairhaven has a population of 187 people and approximately 66 houses is designated RX-Residential/Exurban, and zoned RS-X; Residential Suburban. The community has approximately 66 houses for a total population of approximately 187 people. Within the developed area of Fairhaven, there are 125 residential parcels of which 63 are currently developed with 66 houses. The 62 vacant parcels would, under existing land use and zoning designations, be allowed to each contain one new single-family residence. Accessory dwelling units (ADUs) are allowed under the existing land use designation and zoning. ADUs are small dwelling units on a residential property typically containing one bedroom. ADUs may include a small unit separate from the main house, a unit attached to the main house, or an apartment style unit above a garage.

Finntown contains approximately ten homes and has an estimated total population of 28 people (GHD and SHN 2018). Finntown is zoned MC-A, industrial/coastal-dependent, which does not allow further residential development, but does allow a caretaker's quarters.

As described in Section 2.6.17, the construction workforce would fluctuate throughout the project but would be made up of, on average, 90 personnel and up to 165 personnel during the peak for Phases 1 and 2. Phase 3 would have, on average, 45 personnel and up to 115 personnel when the building and utilities are being installed. This number would include the Contractor team, Construction Management Team (CMT), highly skilled trades, journeymen, and laborers.

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

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

Regulatory Setting

Federal

There are no federal policies, plans or regulations applicable to the proposed project with regard to population and housing.

State

Coastal Act

Coastal Act policies, plans and regulations are applicable to the proposed project with regard to population and housing. This is further defined below regarding the HBAP.

State Housing Legislation

State Housing Legislation has been responding to the Statewide Housing Crisis and through the State Housing and Community Development Agency requiring jurisdictions to abide by the following existing regulations in order to provide additional housing.

- Housing Accountability Act (HAA)
- State Density Bonus Law (SDBL)
- Housing Crisis Act of 2019 (HCA)
- Housing Element Law
- No Net Loss Law
- Anti-Discrimination in Land Use Law
- Permit Streamlining Act (PSA)
- Affirmatively Furthering Fair Housing
- Streamlined Ministerial Approval Processes
- By-Right Supportive Housing Provisions
- By-Right Low Barrier Navigation Centers
- Demolition of Housing Units
- Accessory Dwelling Unit Law
- Affordable Housing Preservation Noticing Law
- Surplus Land Act
- Rental Inclusionary Housing
- Limitations on Development Standards
- Minimum Parking Standards
- Five Hearing Rule
- Duplexes and Lot Splits
- Middle Class Housing Act
- Affordable Housing on Faith and Higher Education Act
- The Starter Home Revitalization Act

Regional and Local

Humboldt Bay Area Plan/Local Coastal Plan

The HBAP is the County's Local Coastal Plan applicable to the project area. The HBAP identifies land uses and standards by which development will be evaluated within the Coastal Zone. The following HBAP policies are applicable to the proposed project:

The HBAP limits the amount of growth that can occur within the coastal areas due to various environmental factors, including, but not limited to, the presence of environmentally sensitive habitat areas (ESHAs), wetlands, other coastal resources, designated coastal dependent industrial land uses and the potential for tsunami inundation events and sea level rise.

Humboldt County Housing Element 2019

The Humboldt County Housing Element 2019 provides policies and programs implementing the many State Housing laws to promote adequate housing throughout the County. These Elements, as part of the County's General Plan are updated to reflect the need for housing in Humboldt County.

Discussion

a. Induce substantial unplanned population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?

The Proposed Project would not facilitate the construction of any homes or businesses or the extension of roads or other infrastructure to serve housing. The Project will result in an influx of a construction workforce, which would produce a temporary population growth in the greater Humboldt Bay area. However, such growth is consistent with past, present and future construction projects and industrial uses and the greater Humboldt Bay area will be able to accommodate it. While rental units would be available for longer termed construction workers, shorter-term construction workers typically stay in surrounding motels.

The proposed Project will primarily be re-establishing an industrial use that is not too different from that of the original industrial uses and the resulting development of the surrounding area. However, since the cessation of those industrial uses, the population/housing uses are no longer related to the industrial uses as they used to be. At this time, it is unknown what the size of the workforce will be for long-term operations, but efforts are being made through Cal Poly Humboldt and College of the Redwoods to train a local workforce for jobs related to operational aspects of this Project. Most would be expected to have current housing and would not create a need for additional housing. Developing a local workforce and implementing robust on-the-job training and advancement programs is therefore anticipated to reduce the need for outside-the-area recruitment and the demand on housing. The recent flurry of housing legislation and funding has already resulted in additional housing opportunities in the greater Humboldt Bay area and it is expected that this will continue through the operational phase of this Project.

Typical established local thresholds of significance for housing and population growth, pursuant to CEQA Guidelines Section 15064.7, include effects that induce substantial growth, or concentrate a population, beyond Humboldt County programs; alter the location, distribution, density, or growth rate of the population beyond that programed in the general plan housing element; result in a substantial increase in demand for additional housing; or create a development that significantly reduces the ability of the County or local jurisdictions to meet housing objectives set forth in the general plan housing element or local jurisdiction's housing objectives.

b. Displace a substantial number of existing people or housing, necessitating the construction of replacement housing elsewhere?

There is no existing housing on the Project site and there will be no displacement of people or removal of housing on the Project Site or as a direct result of this project and therefore it is likely to be a Less than Significant impact.

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XV. Public Services

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or a need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:				
Fire protection?	☒	☐	☐	☐
Police protection?	☒	☐	☐	☐
Schools?	☒	☐	☐	☐
Parks?	☒	☐	☐	☐
Other public facilities?	☐	☐	☐	☒

Affected Environment

Fire Protection and Emergency Services

The Peninsula Community Services District (PCSD) (formerly known as Samoa Peninsula Fire Protection District (SPFPD)) provides fire services to the communities of Samoa, Fairhaven, and Finntown, as well as the industrial areas. The SPFPD was the result of the 1994 merging of the Samoa Fire District, formed in 1902, and the Fairhaven Fire District, formed in 1952. In 2019 the SPFPD was "reorganized" consisting of dissolution of the SPFPD and formation of the new PCSD.

The PCSD is an all-volunteer district and is located out of the station at 1982 Gass Street in the Fairhaven area. A second station is located in the town of Samoa but is primarily used to store equipment. The PCSD has a Chief Officer vehicle and a beach rescue vehicle (both four-wheel drive pickups). They are emergency response vehicles and are stocked with defibrillators and general medical equipment.

The PCSD responds to approximately 100 calls annually; 40 of these being within their jurisdiction and 60 being calls to aid other districts. The PCSD has mutual aid agreements with the Arcata Fire District and the Humboldt Bay Fire Department (LAFCo 2017).

The District covers 8 square miles and serves 350 residents including a public school, US Post Office, county campground, several industrial sites, small municipal airport, drag strip, and an off-road

vehicle park. SPFD operates with the Arcata Fire District under a mutual aid agreement, which increases our response and service area by more than double of our first response area. The area population increases by more than 200 people with seasonal workers and visitors during the summer months, weekends, and holidays. (Humboldt County 2020)

Service rates declined from about 2000 until 2011 due to the closure of several industrial facilities in the service area. One of these facilities was converted into a light industrial business park that now employs more than 200 people. The remaining sites are currently being converted into business parks that meet the emerging needs of area's commercial enterprises. There are now many small businesses operating in these former pulp mill sites. The Town of Samoa is in the final planning stages of adding over 100 new homes and 80-unit affordable housing complex, visitor serving facilities, and commercial infrastructure. Construction began in 2019. (Humboldt County 2020)

The Hazard Mitigation Plan (Humboldt County 2020) noted that severe weather, flooding, wildfires and sea level rise were medium hazard risks, while earthquake and tsunami were high hazard risks. Similarly, the Humboldt Bay Harbor, Recreation, and Conservation District has the same hazard risks listed in the Hazard Mitigation Plan. Several action items for better preparation for emergency services is listed in the Hazard Mitigation Plan for both of these entities.

The Port of Humboldt Bay is the only protected deep water port for large ocean-going vessels for the large region and is designated as an official "port of refuge" The Harbor District maintains a 42-foot fire boat and other emergency response equipment, including equipment for oil spill abatement.

Police Services

Police services in all unincorporated areas are provided by the Humboldt County's Sheriff's Office. Services include criminal investigation, court services, and corrections. The California Highway Patrol is responsible for enforcing traffic laws on roadways within the unincorporated areas and on state highways, such as State Highway 255 and US Highway 101.

The Sheriff's Office Operations Bureau is made up of seven units under the command of the Undersheriff. The most visible of these units is the Patrol Unit. Sheriff's Deputies assigned to the Patrol Unit are responsible for responding to emergency calls for service, criminal investigations, and crime prevention through neighborhood and beat patrols. Patrol has one main station in Eureka, and substations in Garberville and McKinleyville. The Main Station in Eureka patrols the Samoa Peninsula.

The Sheriff's Office also has mutual aid agreements with cities and the California Highway Patrol. Mutual aid is an agreement between agencies where the agency of jurisdiction can request manpower or resources from allied agencies or agencies within the surrounding areas. These agencies could be local or state agencies. According to the County's General Plan EIR, the Main Station could respond within 10 minutes or less to calls from Samoa (Humboldt County 2017).

Schools

Humboldt County communities are served by 32 public school districts. Additionally, the Humboldt County Office of Education operates several school facilities in addition to private school entities. Only one school, the Peninsula Union Elementary School is located on the Samoa Peninsula. However, it is located more than 0.16 mile north of the project site. The Peninsula Union Elementary

School is the only school within the Peninsula Union School District and had a student body of approximately 34 students in 2015 (Humboldt County 2017). The next closest school facility is the Redwood Coast Montessori School in Manilla, approximately 2 miles to the north.

Parks and Recreational Facilities

Humboldt Bay and its nearshore environment offers a diverse array of water-based recreational opportunities including sailing, kayaking, paddle boarding, sportfishing and other recreational boating, such as crew, cruise ships, Madaket tours. Other activities include waterfowl hunting, clamming scientific study, diving, etc. Four marinas (Woodley Island, City of Eureka Public Marina, Johnny's Marina, and King Salmon) provide berthing to a mixed fleet of commercial and recreational vessels. A number of boat ramps, piers and other points around the Bay provide access to these water-based recreational opportunities.

Within the Samoa Peninsula, Humboldt County owns and maintains one park and two beach parking areas. The park, the Samoa Boat Ramp and Campground, provides 13 RV sites and 25 tent sites, as well as restroom and shower facilities. The Samoa Dunes Recreation Area, which is adjacent to the Samoa Boat Ramp and Campground, is managed by the Bureau of Land Management (BLM). Samoa Dunes Recreation Area is a multi-recreational park that attracts not only Off-Highway Vehicle (OHV) enthusiasts, but also hikers, surfers, beachcombers and birding and fishing enthusiasts from throughout the region.

Beach access points are located west and southwest of the Project. The Project Site is located directly east of New Navy Base Road at the intersection of New Navy Base Road and Vance Avenue and Cookhouse Road. These beach access points provide continuous access along the ocean for a 15-mile stretch, from the North Jetty to the mouth of Mad River. Nearby beach access points include Samoa Power Pole Beach Access, Milwaukee Beach Access, and Bay Street Beach Access.

Additionally, Peninsula Union Elementary School's baseball and soccer fields are available for public use. Other private recreation facilities include the Women's Club and grounds on Rideout Avenue, Redwood Empire BMX track off Cookhouse Road, Samoa Drag Strip at Samoa Field Airport, as well as the Eureka Field Airport, and the Humboldt Bay Social Club. Other public/community services are provided outside of the project area in surrounding developed communities including Eureka, Manilla, and Arcata.

Regulatory Setting

Federal

There are no federal policies, plans or regulations applicable to the proposed project with regard to public services and recreation.

State

California Occupational Safety and Health Administration

In accordance with California Code of Regulations, Title 8 Sections 1270 "Fire Prevention and Fire Equipment," the California Occupational Safety and Health Administration has established minimum standards for fire suppression and emergency medical services. The standards include, but are not limited to, guidelines on the handling of highly combustible materials, fire hose sizing requirements,

restrictions on the use of compressed air, access roads, and the testing, maintenance and use of all firefighting and emergency medical equipment.

California Health and Safety Code

State fire regulations are set forth in Sections 13000 et seq. of the California Health and Safety Code, which includes regulations for building standards (as set forth in the California Building Code), fire protection and notification systems, fire protection devices such as extinguishers, smoke alarms, high- rise building, childcare facility standards, and fire suppression training.

Regional and Local

Humboldt Bay Harbor District

The Humboldt Bay Harbor District manages Humboldt Bay for the promotion of commerce, navigation, fisheries, recreation, and the protection of natural resources, and to acquire, construct, maintain, operate, develop, and regulate harbor works. The Harbor District continually strives to achieve a balance among potentially conflicting uses of Humboldt Bay, which the Humboldt Bay Management Plan is intended to facilitate.

Humboldt County Emergency Operations Plan

Humboldt County adopted an Emergency Operations Plan (EOP) in 2015 (Humboldt County 2015). The Humboldt County EOP identifies the County's emergency planning, organization and response policies and procedures. It addresses how the County will respond to extraordinary events or disasters, from preparation through recovery, and the responsibilities of each department and emergency operations center position. It also addresses the integration and coordination with other local governments, including special districts and state agencies.

Discussion

a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or a need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:

Fire protection?

The Proposed Project includes buildings and structures that in many ways are similar to the past industrial buildings in and adjacent to the Project site but may also include components that are greater in height or other factors that may limit the abilities of service providers, particularly fire departments. The Project includes fire suppression storage and hydrant system and will be subject to building code requirements for fire suppression. These should result in not needing new or physically altered fire protection facilities.

The Proposed Project also adds a long-term operational workforce to Humboldt County which may require additional personnel or resources at local fire stations, or emergency response or medical services. However, the Proposed Project should not increase demand for emergency services to the extent that construction of new or expansion of existing fire protection and medical service facilities would be required.

Additional information in Section 2 Project Description will need to include details on the operational workforce as well as types of materials, particularly flammable materials, that will be in use during the manufacturing of components and assembly of WTG's. While service providers may not have the capacity or equipment necessary, it doesn't necessarily mean that construction of new facilities will mitigate the concern. Section 2 Project Description needs to describe the HD security plan and hazard response plan/ emergency evacuation plan and evaluate proposed measures in the County's Hazard Mitigation Plan. Referral comments are necessary to answer if the service provided has capacity (maintain acceptable service ratios, response times, or other performance objectives).

Police protection?

The Proposed Project includes buildings and structures that in many ways are similar to the past industrial buildings in and adjacent to the Project site. The Project will be fenced/gated with controlled access and its own security team. This should result in not requiring the need for new or physically altered police protection facilities.

The Proposed Project also adds a long-term operational workforce to Humboldt County which may require additional personnel or resources at local police stations or Humboldt County Sheriff's Office, or other emergency services. However, the Proposed Project should not increase demand for police services to the extent that construction of new or expansion of existing police service facilities would be required.

Based on details on the operational workforce during the manufacturing of components and assembly of WTG's, and the Project's security plan and hazard response plan/emergency evacuation plan, the EIR will evaluate proposed measures in the County's Hazard Mitigation Plan. Referral comments are necessary to answer if the service provided has capacity (maintain acceptable service ratios, response times, or other performance objectives). While service providers may not have the capacity necessary, it doesn't necessarily mean that construction of new facilities will mitigate the concern.

Schools?

The Proposed Project adds a long-term operational workforce to Humboldt County which may require additional personnel or resources at local schools. However, the Proposed Project should not increase demand to the extent that construction of new or expansion of existing school facilities would be required.

Parks?

The effect of the induced population from long-term operations as a result of this project will need to be evaluated on its effect to existing recreation facilities. In addition, the assembly of WTGs may create a draw and interest by tourists who may use a preferential location to best view the operations. These considerations should be considered in future analysis.

Other public facilities?

There have been no other facilities identified that would result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or a need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts.

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XVI. Recreation

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:					
a.	Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☒	☐	☐	☐
b.	Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☒	☐	☐	☐

Affected Environment

Project Site

The Project Site and surrounding area is an overwhelmingly industrial area. The Upland Development Subarea is accessed by existing roadways and has had industrial land uses for at least 70 years. The Project Area is designated MC-Industrial/Coastal Development and NR-Natural Resources by the Humboldt Bay Area Plan (the Local Coastal Program that is included in the General Plan for coastal areas) and is not designated as an area for recreational use. The Upland Development Sub Area is not currently open to the public, nor has it supported recreational activities in the past. There is no existing recreational use on the Project Site, and it is not listed as such in the Humboldt County Trails Plan or other sources. This means that the Project Site has not been identified as suitable for recreation. This former industrial site does not have a history of land uses involving recreation; rather it has been used as a timber processing and pulp mill site. As the site is being developed and operating the site will remain secure (fenced/gated/access control).

Operation of the facility will include wet storage areas and use of the Navigation channel and Entrance Channel for barging in supplies and equipment and towing assembled WTGs and related appurtenances out of Humboldt Bay. These water areas are utilized, not only by commercial fishing and shipping activities but also a mix of recreational water recreational activities as described below.

Recreation Facilities

Humboldt Bay and its nearshore environment offers a diverse array of water-based and land-based recreational opportunities.

Humboldt Bay and its nearshore environment offers a diverse array of water-based recreational opportunities including sailing, kayaking, paddle boarding, sportfishing and other recreational boating, such as crew, cruise ships, Madaket boat tours. Other activities include waterfowl hunting, clamming scientific study, diving, etc. Four marinas (Woodley Island, City of Eureka Public Marina, Johnny's Marina, and King Salmon) provide berthing to a mixed fleet of commercial and recreational

vessels. A number of boat ramps, piers and other points around the Bay provide access to these water-based recreational opportunities.

Within the Samoa Peninsula, Humboldt County owns and maintains one park and two beach parking areas. The park, the Samoa Boat Ramp and Campground, provides 13 RV sites and 25 tent sites, as well as restroom and shower facilities. The Samoa Dunes Recreation Area, which is adjacent to the Samoa Boat Ramp and Campground, is managed by the Bureau of Land Management (BLM). Samoa Dunes Recreation Area is a multi-recreational park that attracts not only Off-Highway Vehicle (OHV) enthusiasts, but also hikers, surfers, beachcombers and birding and fishing enthusiasts from throughout the region.

Beach access points are located west and southwest of the Project. The Project Site is located directly east of New Navy Base Road at the intersection of New Navy Base Road and Vance Avenue and Cookhouse Road. These beach access points provide continuous access along the ocean for a 15-mile stretch, from the North Jetty to the mouth of Mad River. Nearby beach access points include Samoa Power Pole Beach Access, Milwaukee Beach Access, and Bay Street Beach Access.

Additionally, Peninsula Union Elementary School's baseball and soccer fields are available for public use. Other private recreation facilities include the Women's Club and grounds on Rideout Avenue, Redwood Empire BMX track off Cookhouse Road, Samoa Drag Strip at Samoa Field Airport, as well as the Eureka Field Airport, and the Humboldt Bay Social Club. Other public/community services are provided outside of the project area in surrounding developed communities.

County of Humboldt recently reduced unwarranted parking and increased safety for recreational users. The County prohibited parking on the westside of New Navy Base Road between designated hours in an effort to discourage off road vehicle use of adjacent vegetated dunes. Additionally, as a required condition of approval to the Samoa Town Master Plan Project (County CDP Case No. PLN-2020-16401), there are proposed trails as well as improvements proposed to Milwaukee Beach Access. The Humboldt County Regional Trails Master Plan (Humboldt County 2010) identifies additional planned facilities and work is being done for the development of the Great Redwood Trail, which utilizes an adjacent rail line at the western border of the Project. Cumulatively, these unrelated projects will enhance the overall public recreational access points and recreational use adjacent to the Project Site.

Regulatory Setting

Federal

The Federal Consistency Unit of the California Coastal Commission implements the federal Coastal Zone Management Act (CZMA) of 1972 as it applies to federal activities, development projects, permits and licenses, and support to state and local governments.

There are no other federal policies, plans or regulations applicable to the proposed project with regard to recreation. Federal government agencies both fund and manage nearby recreational facilities.

State

California Coastal Act

Coastal Act Sections 30210 through 30224 require that new development maximize public access and recreation opportunities, provide low-cost visitor-serving recreational facilities, protect oceanfront land for recreational use and development, encourage recreational boating facilities, and in general establish that coastal-dependent, visitor serving, and public recreational access developments have priority over other types of uses and development.

The Coastal Commission, in concert with the Harbor District and coastal cities and counties, is responsible for the planning of land and water uses within the coastal zone, and the regulation of proposed development activities. The Coastal Commission is the State's designated coastal management agency for the Pacific Coast in Humboldt County, and administers the federal CZMA. The Coastal Act provides that coastal-dependent developments, including coastal dependent industry (CDI), coastal-related developments, and coastal recreation uses, shall have priority over other developments on or near the shoreline.

Regional and Local

Humboldt Bay Harbor District

The Humboldt Bay Harbor District manages Humboldt Bay for the promotion of commerce, navigation, fisheries, recreation, and the protection of natural resources, and to acquire, construct, maintain, operate, develop, and regulate harbor works. The Harbor District continually strives to achieve a balance among potentially conflicting uses of Humboldt Bay, which the Humboldt Bay Management Plan is intended to facilitate.

Discussion

a. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

The Project will result in an influx of a construction workforce, which would produce a temporary population growth in the greater Humboldt Bay area. However, such growth is consistent with past, present, and future construction projects and industrial uses and the greater Humboldt Bay area recreational facilities will be able to accommodate increased recreational use as a result. There are ample recreational facilities within the greater Humboldt Bay area, especially within several miles of the Project Site.

The Project may result in increased conflicts with recreational water use due to towing and wet storage of assembled WTGs. Recreational water use may be impacted but the facility (Humboldt Bay) won't deteriorate as a result.

The effect of the induced population from long-term operations as a result of this project will need to be evaluated on its effect to existing recreation facilities.

b. Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?

The Proposed Project would not facilitate the construction or expansion of any recreational facilities. The Project will result in an influx of a construction workforce, which would produce a temporary population growth in the greater Humboldt Bay area. However, such growth is consistent

with past, present, and future construction projects and industrial uses and the greater Humboldt Bay area will be able to accommodate increased recreational use as a result.

The effect of the induced population from long-term operations as a result of this project will need to be evaluated on its effect to existing recreation facilities. In addition, the assembly of WTGs may create a draw and interest by tourists who may use a preferential location to best view the operations. These considerations should be considered in future analysis.

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XVII. Transportation

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:					
a.	Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?	☒	☐	☐	☐
b.	Conflict or be inconsistent with State CEQA Guidelines section 15064.3, subdivision (b)?	☒	☐	☐	☐
c.	Substantially increase hazards because of a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☒	☐	☐	☐
d.	Result in inadequate emergency access?	☒	☐	☐	☐

Affected Environment

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, and 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.

The Port of Humboldt Bay is a working port that can handle ocean-going vessels with domestic or international cargoes, including mid-sized cargo ships up to the "Panamax"16 class. Humboldt Bay is the only deep-water shipping port between San Francisco, 225 nautical miles to the south, and Coos Bay, Oregon, 156 nautical miles to the north. Maintaining an improved entrance to the Bay and dredging the entrance channel and major navigation channels are necessary to accommodate safe and economically viable shipping, as well as commercial fishing, by ocean-going ships and barges. In general, the channel system in Humboldt Bay consists of the entrance channel and turning basin, a northerly channel from the turning basin to North Bay and Samoa that forks around Woodley Island, and a southerly channel to Fields Landing in South Bay that ends in a turning basin. After a 12-year effort, the Humboldt Bay Channel Deepening Project was completed in April 2000, resulting in a 48-foot deep Bar and Entrance Channel and 38-ft deep North Bay and Samoa Channels, intended to provide for greater navigation safety and improved vessel economics.

Approximately 15 percent of Humboldt Bay's shoreline is devoted to port-related, marine uses and activities. Adjacent to the Humboldt Bay channels are seven operating docks that can serve ocean-going dry cargo vessels, and one oil terminal that serves liquid bulk cargo vessels. Three of the eight docks are located on the Eureka waterfront, four are located on the Samoa Peninsula, and one is located at Fields Landing. Historically, forest products were the mainstay of commercial shipping in the Bay, and despite declines in the industry overall, they remain critically important. Extreme

shoaling at the entrance to Humboldt Bay due to winter storm activity has required the Humboldt Bar Pilots to issue draft restrictions in recent years.

Commercial fishing remains an active industry in the Bay, with Eureka-area ports accounting for an average of 38 percent of regional commercial landings from 1981–2017 (County 2018). Woodley Island Marina and the Eureka Public Marina provide moorage for commercial and recreational vessels, with the majority of the active Humboldt fishing fleet based at Woodley Island. Without regular dredging in the marinas, shoaling can make some slips unusable for deeper draft vessels.

The transportation system within the area consists of various modes of land- based transportation, including walking, biking, public transit, and automobile.

Public transit services, consisting of bus services, are served by two providers. Services are provided by the Redwood Transit System, which services the communities of Scotia, Fortuna, Loleta, Fields Landing, Eureka, Arcata, McKinleyville, Westhaven, and Trinidad. Bus services are also provided by Southern Humboldt Intercity which provides service to the communities of Redcrest, Weott, Meyers Flat, Miranda, Phillipsville, Redway, Garberville, Benbow Rio Dell, Fortuna, and Eureka, as well as the College of the Redwoods. In addition to public transit, there is an extensive bicycle and pedestrian network. This network includes both designated bicycle/pedestrian facilities as well as those that are shared by motorized vehicles.

As described in more detail in the Project Description, construction access will be from both the land and water to the Project site. Two access points will be constructed during Phase 0 and used during Phase 1 and 2 (Figure 11). The North Entrance will be at the north end of the site and accessed off of Vance Avenue. The West Entrance will be at the south end of the site and accessed via the West Access Road that connects to New Navy Base Road.

It is expected that any large deliveries, such as crane components and piles will be delivered through the West Access Road or from barge. A construction road on site will need to be maintained at all times to allow for unobstructed movement on site. The Contractor will be responsible for this and will need to coordinate with all subcontractors to avoid blocking access to work. Smaller deliveries and construction workforce will likely use the North Entrance to gain access to the site but may use the West Access Road if certain work makes this access impractical or unsafe.

The waterfront construction will be accessed directly from Humboldt Bay via tugs and barges. Due to the shallow depths near shore, the Contractor will likely need to perform some amount of the planned dredging to gain closer access to the construction site. Crew boats will be utilized to transport the workforce to the floating equipment.

There will be four access points into the RMMT site (two primary access points and two secondary access points). The two primary access points for vehicular traffic will be the North and West Access Roads. 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. The two secondary access points will be for limited special and emergency type access. The secondary access points are located across from LP Drive on the west property boundary and along the southeast side of the RMMT site.

The proposed North access road will follow a similar alignment to that of an existing access road on the site. The existing dirt road provides access from Vance Avenue to the project site. The existing

road starts at an approximate elevation of 16.5 feet where it ties-in to Vance Avenue and slopes down to average elevations between 11 feet and 12 feet where the road enters the RMMT site.

The proposed access road will follow an existing (paved) segment of Vance Avenue between LP Drive and the recently constructed Phyllis Rex Townhomes in the Town of Samoa, until Vance Avenue turns to the north as it approaches the townhomes. After Vance Avenue turns to the north, the West Access Road will continue running parallel to the GRTA corridor until it reaches the project site. This segment of land between Vance Avenue and the project site does not contain an existing access road, is vegetated, and the existing ground surface is sloped.

Regulatory Setting

Federal

America's Marine Highway Program

The U.S. Department of Transportation Maritime Administration (MARAD) published a final rule in 2009 (amended and expanded in 2012 and 2017) that established America's Marine Highway Program. The Proposed Project authorizes the designation of Marine Highway Routes and Projects and makes funds available to support short sea transportation projects. The objectives of America's Marine Highway Program are to mitigate the economic, environmental, and energy costs of landside congestion; integrate the marine highway into the transportation planning process; and research improvements in efficiencies and environmental sustainability. The Port of Humboldt Bay is adjacent to Marine Highway M-5 Route which includes the Pacific Ocean coastal waters, connecting commercial navigation channels, ports, and harbors from San Diego, CA to the US-Canada border north of Seattle, WA. It connects to the M-84 Route at Astoria, OR, and the M-580 Route at Oakland, CA, and serves the landside route Interstate 5.

State

State Senate Bill 743 and State CEQA Guidelines Section 15064.3

SB 743, codified in Public Resources Code Section 21099, shifted transportation impact analysis under CEQA from a focus on automobile delay as measured by level of service (LOS) toward a focus on reducing VMT. The Legislature required the Governor's OPR to propose new criteria for determining the significance of transportation. The statute states that on certification of the new criteria, automobile delay, as described solely by LOS or similar measures of vehicular capacity or traffic congestion, would not be considered a significant impact on the environment under CEQA, except in any locations specifically identified in the new criteria. Lead agencies are required to analyze a project's potentially significant transportation impacts related to air quality, noise, safety, and other resource areas that may be associated with transportation. The new criteria, contained in CEQA Guidelines section 15064.3, was certified, and adopted in December 2018. Section 15064.3 provides that VMT is the most appropriate metric to assess transportation impacts with limited exceptions and a project's effect on automobile delay does not constitute a significant environmental impact. Other relevant considerations may include the project's effects on transit and nonmotorized travel.

Local

Humboldt County Regional Transportation Plan

The Humboldt County Association of Governments (HCAOG) is a joint powers authority comprising the County of Humboldt and the seven incorporated cities, each with a seat on the Board of Directors. Under its authority as the Regional Transportation Planning Agency for Humboldt County, HCAOG adopts and submits an updated Regional Transportation Plan (RTP), a long-range (20-year) transportation planning document for Humboldt County, to the California Transportation Commission and Caltrans every 5 years. The most recent updates of the RTP were completed in 2014 and 2017 and are entitled "Variety in Rural Options of Mobility" (VROOM). The Goods Movement Element of the RTP includes the following policies relevant to the Proposed Project:

- Policy GM-1 (Intermodal) HCAOG will fully consider goods movement needs and impacts in developing a multimodal transportation system, in partnership with other governmental entities, community organizations, shippers and carriers, and other interested parties. {California Transportation Plan 2025 Strategy}
- Policy GM-2 (Intermodal) HCAOG will promote multiple uses of transportation corridors and strategic use of intermodal transfer facilities.
- Policy GM-5 (Maritime) HCAOG will support the Harbor District's efforts to develop a fully operational, sustainable, and environmentally compatible maritime transportation system as consistent with the Harbor District's mission and goals.
- Policy GM-10 (Goods Movement) HCAOG will support projects that improve intermodal freight access and reduce congestion, especially along freight corridors, including designated marine highways.
- Policy GM-13 (Maritime) HCAOG will assist local, regional, or state lead agencies in preserving coastal-dependent land uses as necessary for successfully operating the regional maritime transport system.

Discussion

a. Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?

The EIR will evaluate consistency of the proposed project with local transportation plans, including the Humboldt County Regional Transportation Plan.

b. Conflict or be inconsistent with State CEQA Guidelines section 15064.3, subdivision (b)?

The EIR will assess increases in VMT as a result of the proposed project.

c. Substantially increase hazards because of a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

The EIR will assess potential hazards related to use of roadways by project-related construction and operational equipment.

d. Result in inadequate emergency access?

The EIR will assess the potential for project-related construction activities, including traffic, and project operations, including transporting materials and equipment to the site to affect emergency access.

References Cited

Printed References

Humboldt Bay Maritime Industrial Use Market Study FINAL REPORT, Humboldt County, May 2018

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XVIII. Tribal Cultural Resources

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
a. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☒	☐	☐	☐
b. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☒	☐	☐	☐

Affected Environment

This section describes the regulatory and environmental setting in the Proposed Project area related to tribal cultural resources during construction and operation of the Project. Section V, Cultural Resources, contains information regarding the archeological and historic resources. The Cultural Resources section includes non-confidential portions of the document "A Preliminary Archeological Investigation Report for the Humboldt Bay Offshore Wind and Heavy Lift Marine Terminal Project on the Samoa Peninsula in Humboldt County, California. September 16, 2022." The terrestrial portion of the Project Site (termed the Area of Potential Effect (APE) in the cultural resources report prepared for the Project) included the upland Project Site and the nearshore components proposed within Humboldt Bay.

The Tribal Cultural Resources section relies on that background information, as described in Section V, Cultural Resources, and focuses instead on the AB 52 process and evaluates the potential impacts of the Project related to tribal cultural resources as a result of AB 52 consultation. Consultation is an ongoing process that will continue throughout the CEQA process and therefore this section will continue to evolve as consultation continues.

Environmental Setting

The study area for the terrestrial portion of the Project Site (termed the Area of Potential Effect (APE) in the cultural resources report prepared for the Project) included the upland Project Site and the nearshore components proposed within Humboldt Bay. The APE is within the traditional

territory of the Wiyot Tribe, which once encompassed several hundred square miles extending from the Bear River Mountains in the south to the Little River in the north; and in general, the first mountain range crest to the east. The cultural resources report identified the known tribal cultural resource sites within the Project Area. Other nearby qualifying tribal cultural resources exist, which is the topic of discussion of AB 52 consultation.

During the 2022 cultural investigation, representatives of the Harbor District informally met with some of the representatives of the local Tribal community to discuss the proposed Project. Roscoe and Associates initiated correspondence regarding this Project with local tribal representatives based on prior knowledge of the area, and professional relationships with the area's three local Wiyot groups who have shown consistent interest in the Samoa Peninsula area. This correspondence, which occurred in April and May, 2022, was conducted to request information regarding known archaeological sites within the Project's vicinity, and to discuss any potential concerns these groups may have regarding the protection of archaeological and/ or tribal cultural resources. (Roscoe and Associates 2022)

Roscoe and Associates' identification effort included a review of regional archaeological and ethno-geographic literature, historical maps and air photos, a project vicinity record search at the Northwest Information Center in Rohnert Park, California, correspondence with the Native American Heritage Commission (NAHC) and local Native American Tribal Representatives. Two known archaeological sites are documented in the current APE (CA-HUM-21 and CA-HUM-22), and the Humboldt Bay shoreline is known to have been a favored location for Wiyot villages for thousands of years. (Roscoe and Associates 2022).

As part of the AB 52 California Environmental Quality Act (CEQA) process, in 2023, the Harbor District requested formal consultation with local tribes, in accordance with the current NAHC list on file, and followed up with a number of meetings with tribal councils and their Tribal Historic Preservation Officer (THPO).

The Humboldt District initiated this formal consultation regarding tribal cultural resources pursuant to Assembly Bill (AB) 52 via letter on June 23, 2023 with the Bear River Band of the Rohnerville Rancheria, Blue Lake Rancheria, Cher-Ae Heights Indian Community of the Trinidad Rancheria, Yurok Tribe, Hoopa Valley Tribe, Elk Valley Rancheria, Big Lagoon Rancheria, Karuk Tribe, Resighini Rancheria, Round Valley Tribe, and the Wiyot Tribe. The AB 52 process will continue throughout the CEQA process.

The Wiyot Tribe submitted a request for Consultation, which was received by the Harbor District on July 10, 2023 from Ted Hernandez, Chairperson of the Wiyot Tribe, Tribal Council. Following the request for formal AB 52 Consultation with the Wiyot Tribe, a formal meeting was held on September 27, 2023 and January 5, 2024. The Wiyot Tribe raised several concerns to the Ancestral Land including the adjacent Tuluwat island with potential impacts to traditional foods, World Renewal Ceremony, Brush Dance Ceremony, ground disturbance during construction, discharge of hazardous materials, and other non-AB-52 items. The discussions are still ongoing and potential mitigations are still to be determined.

The Yurok Tribe submitted a request for Consultation, which was received by the Harbor District on July 17, 2023 from Megan Siaosi, Self Governance Director of the Yurok Tribe. Following the request for formal AB 52 Consultation with the Yurok Tribe, a formal meeting was held on August 30, 2023

and September 16, 2023. There were no identified Tribal Cultural Resources on the subject project area.

The Hoopa Valley Tribe submitted a request for Consultation, which was received by the Harbor District Following the request for formal AB 52 Consultation with the Hoopa Valley Tribe, a formal meeting was held on August 10, 2023. There were no identified Tribal Cultural Resources on the subject Project area.

The Bear River Band of the Rohnerville Rancheria submitted a request for Consultation, which was received by the Harbor District on September 1, 2023 from Melanie McCavour, Tribal Historic Preservation Officer (THPO) and Cultural Director of the Bear River Band of the Rohnerville Rancheria. Following the request for formal AB 52 Consultation with the Bear River Band of the Rohnerville Rancheria, a formal meeting was held on September 12, 2023. The discussions are still ongoing and potential mitigations are still to be determined.

The Cher-Ae Heights Indian Community of the Trinidad Rancheria (Trinidad Rancheria) submitted a request for Consultation, which was received by the Harbor District. Following the request for formal AB 52 Consultation with the Trinidad Rancheria, a formal meeting was held on October 3, 2023. The discussions are still ongoing and potential mitigations are still to be determined.

The Elk Valley Rancheria submitted a request for Consultation, which was received by the Harbor District on September 7, 2023 from Jennifer Gisler, Office Manager of the Elk Valley Rancheria. Following the request for formal AB 52 Consultation with the Elk Valley Rancheria, a formal meeting was held on October 11, 2023. There were no identified Tribal Cultural Resources on the subject Project area.

The Blue Lake Rancheria submitted a request for Consultation, which was received by the Harbor District on July 19, 2023 from Jacob Pounds, Tribal Historic Preservation Officer of the Hoopa Valley Tribe. Following the request for formal AB 52 Consultation with the Hoopa Valley Tribe, a formal meeting was held on October 10, 2023. The discussions are still ongoing and potential mitigations are still to be determined.

As noted in the Coastal Commission's August 25, 2023 response to the Project's Notice of Preparation (NOP):

> "Archaeological and Tribal Cultural Resources
>
> Coastal Act Section 30244 requires that mitigation be required for adverse impacts to archaeological resources. In addition, AB 52 requires that the Humboldt Bay Harbor, Recreation, and Conservation District (HBHRCD) consult with Tribes as part of the CEQA process. We are supportive of the inclusion of tribal cultural resources in the topics to be analyzed in the DEIR and we encourage the HBHRCD to consult with Tribes on matters beyond archaeological and cultural resources in relation to the project. For example, the proposed project is located near lands that are of importance to various Tribes, including, but not limited to, Tuluwat Island. Some of these lands are being considered for designation in the Wigi National Monument, and we encourage the HBHRCD to consult with Tribes about project impacts on this proposed national monument and other culturally important properties. In Commission staff's consultations with Tribes during our review of the Bureau of Ocean Energy Management's offshore wind lease sale off Humboldt County, we heard concerns about both offshore development in the lease areas and port development in Humboldt Bay including the need for responsible development, public safety, and the potential for adverse impacts to tribal fisheries. Discussion of the tribal consultation conducted through the Commission's process is available in the adopted findings for CD-0001-22 under the Tribal and Cultural Resources section, with discussion of public safety concerns in the Environmental Justice section. In short, the concerns

expressed to Commission staff by Tribal representatives were not limited to archaeological and cultural resources. We therefore encourage the HBHRCD to take an expansive approach to the topics included in consultation and to addressing concerns raised by Tribes."

Regulatory Setting

Federal

See Section V Cultural Resources for a summary of Federal Regulations

State

Assembly Bill 52 (AB 52)

AB 52, enacted in 2014, amended sections of CEQA relating to Native Americans. AB 52 establishes a new category of cultural resources, named tribal cultural resources (TCRs), and states that a project that may cause a substantial adverse change in the significance of a TCR may have a significant effect on the environment. Section 21074 was added to the Public Resources Code to define TCRs, as summarized:

1. TCRs are either of the following:
    a. Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:
        1) Included or determined to be eligible for inclusion in the California Register of Historical Resources.
        2) Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1.
    b. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1. In applying the criteria set forth in subdivision (c) of Section 5024.1 for the purposes of this paragraph, the lead agency would consider the significance of the resource to a California Native American tribe.
2. A cultural landscape that meets the criteria of subdivision (a) is a TCR to the extent that the landscape is geographically defined in terms of the size and scope of the landscape.
3. A historical resource described in Section 21084.1, a unique archaeological resource as defined in subdivision (g) of Section 21083.2, or a "non-unique archaeological resource" as defined in subdivision (h) of Section 21083.2 may also be a tribal cultural resource if it conforms with the criteria of subdivision (a).

AB 52 requires the lead agency to begin consultation with any tribe that is traditionally or culturally affiliated with the geographic area. In addition, AB 52 includes the following time limits for certain responses regarding consultation:

- Within 14 days of determining that an application for a project is complete or a decision by a public agency to undertake a project, the lead agency would provide formal notification to the designated contact of, or a tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice.

- After provision of the formal notification by the public agency, the California Native American tribe has 30 days to request consultation.
- The lead agency must begin consultation process within 30 days of receiving a California Native American tribe's request for consultation.

AB 52 (Chapter 532, Statutes of 2014) establishes a formal consultation process for California Native American tribes as part of CEQA and equates significant impacts on tribal cultural resources with significant environmental impacts (new PRC § 21084.2; ICF 2020).

See Section V, Cultural Resources, for a summary of other State Regulations

Regional and Local

See Section V, Cultural Resources, for a summary of applicable Regional and Local Regulations.

Discussion

a. Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is: Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?

There is the potential for affected tribal cultural resources as a result of the Project that are listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code § 5020.1(k).

The AB 52 process will continue throughout the CEQA process.

b. Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is: A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1?

There is the potential for affected tribal cultural resources as a result of the Project that are significant pursuant to criteria set forth in subdivision (c) of Public Resources Code § 5024.1.

The AB 52 process will continue throughout the CEQA process.

References Cited

Printed References

Roscoe and Associates. 2022. A Preliminary Archeological Investigation Report for the Humboldt Bay Offshore Wind and Heavy Lift Marine Terminal Project on the Samoa Peninsula in Humboldt County, California. September 16, 2022.

Personal Communications

Wiyot Tibe

Ted Hernandez, Tribal Council Chairman

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Marnie Atkins, Tribal Council Secretary

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Natalia Flower,

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Joe James, Tribal Council Chairman

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XIX. Utilities and Service Systems

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:					
a.	Require or result in the relocation or construction of new or expanded water, wastewater treatment, stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☒	☐	☐	☐
b.	Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?	☒	☐	☐	☐
c.	Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☒	☐	☐	☐
d.	Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☒	☐	☐	☐
e.	Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☒	☐	☐	☐

Affected Environment

The utilities on the Project site consist of electrical, natural gas, fire protection water, future bay water, storm drain, and sanitary sewer. These utilities will be re-routed outside of the Project area or demolished and removed from the site. The utilities that are proposed to serve the Project site are domestic potable water, untreated industrial water, fire protection water, storm drain, sanitary sewer, electrical, roof mounted solar, ground mounted solar, and telecommunications. All the new utilities, existing site utilities that must be re-routed, and the planned utilities for adjacent projects are included in the offsite utility corridor and shown in Figure 19.

Water

The Humboldt Bay Municipal Water District (HBMWD) provides industrial untreated and potable water services to the Samoa Peninsula. The source of the industrial and potable water is the Mad River. HBMWD maintains two separate pipeline systems delivering treated drinking water (potable) and untreated raw (non-potable) industrial water to its customers in the area. HBMWD maintains a Capital Improvement Plan (CIP) to ensure that facilities and infrastructure are maintained and

improved over time. These efforts have included projects on the Samoa Peninsula. The domestic system is served by a 12-inch diameter, concrete-lined transmission pipe that is routed down the peninsula, and then looped though a 27-inch diameter, steel pipeline under Humboldt Bay (GHD 2021).

The industrial untreated water transmission line is a 42-inch diameter, concrete-lined corrugated pipeline that ends approximately due east of the DG Fairhaven power plant. Laterals from the main water transmission line exist on to the Project Site. Historically, this line served pulp mills on the peninsula; however, the vast majority of the industrial demand has since subsided leaving substantial capacity in the system available for use. (GHD 2021). The industrial water system of the HBMWD was designed and constructed to provide approximately 60 million gallons per day of raw water to the peninsula to serve the former pump mills. This system does not have any treatment, so turbidity in the water source (the Mad River) is reflected in the industrial water. It may be necessary to modify the existing system to reduce the turbidity of the water supply. The system was sized for a larger capacity than what will likely be required to support the Project and the surrounding developments on the peninsula.

HBMWD currently supplies domestic water from the Mad River for the Project area. The northern end of the site is in proximity to potable water from the Town of Samoa's water main. The southern end of the site (late phase construction) is in proximity to connection at LP Drive on the western boundary of the Project site and connects to the existing 15-inch HBMWD domestic water main. Domestic water is anticipated to provide water for restrooms, sinks, kitchens, drinking fountains, and other similar uses at all site buildings and each wharf. Depending on the activities within each building, there may be additional potable water demands.

Industrial water is currently supplying fire water to the Project site and other neighboring Harbor District properties. A one million-gallon (1-MG) industrial water storage tank, owned and operated by HBMWD, is located southwest of the Project Site, approximately 600 feet west of the Project Site between Vance Avenue and New Navy Base Road. Fire water will be needed to provide fire suppression for the various buildings to be constructed on the site. Fire water will also need to serve all fire hydrants throughout the site. The northern end of the site (early phase construction) will likely receive fire water from the Town of Samoa's water main. The southern end of the site (late phase construction) will receive fire water from Humboldt Bay Municipal Water District's industrial water main. A new fire water storage tank will be needed on site to replace the existing red tank.

Existing residences within the Samoa Urban Study Area (Samoa USA) receive water service from the Samoa Pacific Group, LLC. The Samoa Pacific Group, LLC purchased the town of Samoa in 2001 and is a retail customer of HBMWD. According to the Samoa Town Master Plan Draft EIR, the Samoa Pacific Group, LLC has contracted with HBMWD to receive up to 0.450 MGD of treated water. Estimated average day flows for the proposed Samoa Town are approximately 0.175 MGD, while peak day flows are being estimated at around 0.315 MGD. Samoa Town has approximately 104 connections, while the proposed development would add approximately 318 more residential connections and several industrial connections. (Humboldt County, 2019).

The Samoa Pacific Group, LLC has proposed to upgrade the entire domestic distribution system as a part of its development proposal. Water storage will also be provided as part of the project to provide for domestic and fire uses in case of a power outage or catastrophic failure on the Peninsula supply line. (Humboldt County, 2019).

The Nordic Aquafarm development and other potential users will be utilizing a planned for sea water withdrawal at Red Tank Dock and a supply line running through the nearshore marine terminal shoreline. The seawater supply line will be re-routed into a utility corridor as part of the Project. As Red Tank Dock is to be replaced as part of the marine terminal redevelopment, the seawater withdrawal will need to be accommodated on that new pier.

Wastewater (Sanitary Sewer)

Wastewater treatment will be provided by the Samoa Wastewater Treatment Facility (WWTF). Sanitary sewer service is proposed for the various buildings to be constructed on the site. Sanitary sewer service will be limited to demands from general office use (restrooms, kitchens, etc.).–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 force main that conveys the treated effluent from the WWTF to the ocean outfall is approximately 0.75 mile long, 4-inches in diameter, and follows the proposed alignment for Vance Avenue included in the Samoa Improvement Plans from the Samoa Pacific Group (Figure 19).

In the past, the only central sewer treatment system on the Samoa Peninsula was within the town of Samoa. There were two original systems serving the existing houses, generally referred to as System A and System B. System A provided sewer collection, transport, treatment (redwood bark filters), and disposal (percolation pond) to most of the houses and buildings. System B provided sewer collection, transport, treatment, and disposal to approximately 25 homes and the Women's Club located along Sunset Avenue. The Samoa WWTF was recently installed to serve the new Phyllis Rex Townhomes development in the Town of Samoa and connects into System A's disposal system. Currently, the Peninsula Community Services District owns, operates, and maintains all three of the existing wastewater systems, which includes three large holding tanks, conveyance piping, pumping, a large holding reservoir/pond, disposal percolation basin, and the third treatment unit. (GHD 2021). The existing systems are expected to be replaced as part of the Samoa Town Master Plan with a single community system that would serve approximately 454 connections. It is estimated that average dry weather flows would amount to approximately 0.2 MGD. Peak hourly flowrates are estimated at 1 MGD, using a peaking factor of 5. (Humboldt County, 2019).

The Project Site and all residential and commercial/business properties within the communities of Fairhaven and Finntown have been primarily served through onsite, individual septic tank and leach field systems that are each property owner's responsibility. Physical conditions that exist on the peninsula (high groundwater, coarse sandy soils, and small residential lots) make it infeasible for septic system discharges to meet water quality objectives set forth in the Water Quality Control Plan for the North Coast Region. Active industrial properties have been served by onsite leach fields, which is the case for the Project Site. Future expansion of the treatment systems is planned to provide wastewater treatment and disposal to all properties on the Samoa Peninsula consistent with the Humboldt Bay Area Plan. (GHD 2021). Wastewater from the site will need to be pumped in order to tie in to connect to Samoa's sewer system. This will require sewage lift stations and force mains. The existing museums and the Samoa Cookhouse may also need to be served by a sewage lift station and force main.

Stormwater

The Samoa peninsula is made up of typically well-drained soils (coarse sands) and topographic features that do not typically require addressing runoff issues. Most of the open space areas on the peninsula are made up of dune habitat or former dune habitat, providing ample pervious surfaces. No formal stormwater systems, other than privately owned drainage ditches, storm drain catch basins, culverts and underground piping are located on some of the developed industrial properties. Stormwater currently drains to existing ditches and irregular culvert systems that discharges to either the ocean outfall or ditches/culverts connected to the Bay. According to the Project Description, the Project Site is generally flat and is proposed to be crowned with gentle slopes to both the west and east to stormwater capture (LID) facilities.

All existing storm drain systems identified within the Project site will be removed or abandoned in place based on geotechnical recommendations. The new site drainage proposes to take advantage of the proposed east-west crowned grading to allow surface flow collection around the perimeter of the site (Figure 14b). Bio-filtration planters with 10-year and 100-year overflow risers will be installed not only for stormwater collection, but also for Low Impact Development (LID) treatment. Backlands adjacent to the wharfs will collect stormwater in trench drains along the wharf, which will connect to trash capture devices, LID mechanical treatment, and then outfall to the Bay (Figure 14b). Reconstructed storm drain systems from Samoa will pass through the site to maintain existing drainage patterns.

Due to the proposed grading of the backland, offsite runoff is anticipated to collect and pool along low points of the Project site boundary where it previously flowed across the site, either ponding or discharging to the bay. To relieve drainage collection at certain points along the raised Project boundary, the Project will install 10-year and 100-year overflow pipes throughout the site (Figure 14b).

Solid Waste

Solid waste and recyclables pickup within the Samoa Peninsula is collected by Recology, which also has a recycling plant on the Samoa Peninsula. The County, through Humboldt Waste Management Authority (HWMA), has been trucking its solid waste approximately 175 miles to two out-of-county landfills. One third of this waste is shipped to Dry Creek Landfill near Medford, Oregon under a long-term contract. The remaining two thirds of solid waste is hauled to the Anderson landfill located near Redding, California. Dry Creek Landfill's projected operational life exceeds 100 years under any scenario. The Anderson Landfill is located at 18703 Cambridge Road in Anderson, California. The landowner is Waste Management of California, Inc a subsidiary of Waste Management, Inc. The landfill's maximum permitted throughput is 1,850 tons per day. The remaining capacity is 11,914,025 cubic yards. The estimated closure date is 2055. Together, these two landfills provide Humboldt County its landfill disposal needs over the next 20 years.

Energy

The Project site is currently fed from Pacific Gas and Electric's (PG&E) 1103 circuit, a 12kV distribution line on wood poles, which currently transverses the Project site from the Fairhaven substation 12kV switchyard enroute to feeding Samoa. The Project will include overhead and underground utility relocations, construction of transmission lines, and installation of electrical substations and microgrids. At this time, the load hosting capacity of the Fairhaven 1103 circuit is 7.27MW, which may be adequate to feed Phase 1 of the Project. While the Phase 1 load is estimated

to be between 6.821 and 8.185MVA, the maximum combined Phase 1 and 2 load is estimated at 28.265 megavolt amperes (MVA). The proposed electrical infrastructure will serve the site with redundant 60 kilovolt (kV) lines from the Fairhaven substation.

A Phase 1 microgrid electrical substation is proposed to be sited adjacent to the Storage and Assembly Building and provide power to the facility, as well as serve critical loads in the north end of the terminal (Figure 5). A 480V microgrid is proposed for the Storage and Assembly Building in Phase 1 of the Project. The Project includes a 1.9-MW battery energy storage system with a 3-hour duration of energy storage. The duration is based on a battery load estimate of 1.3MVA for the Phase 1 critical loads. Load shedding of noncritical loads during grid outages can be implemented to extend the hours of resiliency.

To provide emergency back-up operations, a 2-MW generator to serve the Phase 1 critical load of 1.3MVA will be needed. The expected runtime of the emergency generator is based on the reliability of the grid serving the Project site. 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, the number of long-term transmission-level outages due to out-of-county safety issues are expected to be infrequent. Generator operation may be required during future electrical infrastructure work as the Project phases are implemented. These planned utility grid outages could require up to 500 hours of operation during these construction activities. For Phase 2 a 2.5MWDC, ballasted PV system will be needed to connect to the upgraded Harbor District substation via an underground 12kV line during Phase 1 of the Project and a back-up battery system to ensure safe and reliable interconnection.

PG&E also provides natural gas to commercial users on the Samoa Peninsula through a pipeline under Humboldt Bay that begins near 14th Street in Eureka and ends south of Samoa near Bay Street. PG&E currently has a 4-inch steel natural gas service line located adjacent to the electrical substation south of the Project Site.

Telecommunication

Telecommunication lines (wired phones, cellphones, microwave communications, fiber optics, and internet) are located adjacent to the site in various condition and age, serving both past industrial uses as well as current uses on and adjacent to the Project site. These are proposed to be replaced at a capacity to meet Project needs. All the new utilities, existing site utilities that must be re-routed, and the planned utilities for adjacent projects are included in the offsite utility corridor and shown in **Jordan's** Figure 19. The onsite utility corridor has reserved space for a joint trench that is anticipated to include telecommunications and electrical. The onsite utilities are proposed to be routed along the perimeter of the Project site to minimize impact on the utilities from the industry vehicle and equipment traffic.

Regulatory Setting

Federal

- Safe Drinking Water Act
- Federal Water Pollution Control Act of 1972 (Clean Water Act).

State

State Updated Model Landscape Ordinance

The State Updated Model Landscape Ordinance requires the adoption of landscape water conservation ordinances or the adoption of a different ordinance that is at least as stringent as the updated Model Ordinance (MO). The City adopted Water Efficient Landscaping Standards for new and Rehabilitated Landscaping in 2013, as well as the revised SJMC Chapter 15.11

Water Conservation Act of 2009

The Water Conservation Act of 2009 (SB X7-7) requires all water suppliers to increase water use efficiency by reducing per capita urban water use by 20 percent by December 31, 2020. This bill also set a goal for the state of reducing per capita water use by at least 10 percent by December 31, 2015.

California Public Utilities Commission Decision 18-04-007

On April 27, 2018, the California Public Utilities Commission (CPUC) issued Decision 18-04-007, which amended the Right-of-Way rules to provide competitive local exchange carriers with expanded access to public utility infrastructure for the purpose of installing antennas and wireless telecommunications equipment. Specifically, the CPUC mandated that the use of rights-of-way areas shall be limited to those necessary or useful for the provision of telecommunication services, thereby requiring a nexus between the installation and the provision of a telecommunication service.

Renewables Portfolio Standard Program

Established in 2002 under Senate Bill 1078, California established its Renewables Portfolio Standard (RPS) Program, which was accelerated in 2006 under Senate Bill 107. The RPS required 20 percent of electricity sales to be served by renewable energy sources by 2010. In 2008, Executive Order S-14-08 was signed into law requiring retail sellers of electricity to serve 33 percent of their load with renewable energy by 2020. In October 2015, SB 350 was enacted to codify California's climate and clean energy goals. SB 350 requires retail sellers of electricity and publicly owned utilities to procure 50 percent of their electricity from renewable sources by 2030.

Stormwater

The Project site lies within the County of Humboldt's jurisdiction, but is outside the regulated Municipal Separate Storm Sewer System (MS4) permit boundaries. See the regulatory Setting under Regional and Local for additional stormwater regulations.

California Integrated Waste Management Act

The California Integrated Waste Management Act (CIWMA), also known as Assembly Bill 939, required each jurisdiction in the state to divert 50 percent of its solid waste from landfill or transformation facilities by 2000, and established a statewide diversion of 75% by 2020 for all municipal solid waste. The CIWMA also required each County to prepare a Countywide Integrated Waste Management Plan (CoIWMP), which is the main planning document for solid waste management in each County. Humboldt County's CoIWMP is the principal planning document for solid waste management in the county, addressing source reduction, household hazardous waste, and countywide landfill capacity needs.

Title 24 of the California Code of Regulations.

Energy and water consumption by new buildings in California is regulated by the California Green Building Standard Standards Code, embodied in California Code of Regulations (CCR) Title 24. The intent of Title 24 is to provide efficiency standards for new construction and the rehabilitation of both residential and nonresidential buildings, including building energy consumption, water conservation, and operational efficiencies. Title 24 regulates building energy consumption for heating, cooling, ventilation, water heating, and lighting with regard to both electricity and natural gas, while also regulating water consumption through the installation of efficient plumbing fixtures. The efficiency standards apply to both new construction and rehabilitation of both residential and nonresidential buildings. The building efficiency standards are enforced through the local building permit process. Local government agencies may adopt and enforce energy standards for new buildings, provided these standards meet or exceed Title 24 Building Code requirements. The 2016 Standards went into effect January 1, 2017, following approval by the California Building Standards Commission.

Regional and Local

Humboldt Bay Area Plan

The Humboldt Bay Area Plan contains requirements related to the siting of regional electrical transmission lines and the installation of oil and natural gas pipelines. Policies were also added to the HBAP, per the California Coastal Commission, as part of the Samoa Town Master Plan(STMP) General Plan (Local Coastal Plan) Amendment approval.

Stormwater

The Project site lies within the County of Humboldt's jurisdiction, but is outside the regulated Municipal Separate Storm Sewer System (MS4) permit boundaries. Therefore, MS4 stormwater mitigation requirements do not apply to this Project. However, this Project will disturb more than an acre of ground and will be required to meet the post-construction stormwater requirements for the State Water Resources Control Board's (SWRCB) Construction General Permit (CGP). The CGP specifies post-construction runoff reduction requirements for all sites not covered by a Phase I or Phase II MS4 National Pollutant Discharge Elimination System (NPDES) permit.

The CGP post-construction standards require that the Project replicate the pre-project water balance (runoff) for the smallest storms up to the 85th percentile storm event. The CGP emphasizes runoff reduction through onsite stormwater reuse, interception, evapotranspiration, and infiltration through non-structural controls (for example, porous pavement, interceptor trees, downspout disconnection, impervious area disconnection, landscape soil quality preservation/enhancement, and so on). If the use of structural control methods (for example, bioretention basins, detention basins, rain cisterns) is needed, the Project will have to demonstrate the infeasibility of using non-structural practices on the site, or document that there will be fewer water quality impacts through the use of structural practices, and the North Coast Regional Water Quality Control Board (RWQCB) must approve the use of structural practices.

Utility Companies

In addition to the regulations mentioned above, the following local utility companies have their own regulations, policies and standards:

- Humboldt Bay Municipal Water District
- Humboldt Waste Management Authority
- Pacific Gas and Electric
- Peninsula Community Services District
- Recology

Discussion

a. Require or result in the relocation or construction of new or expanded water, wastewater treatment, stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

Construction of new, or expansion of existing, permanent water, wastewater, stormwater drainage, electrical power, natural gas, or telecommunication facilities is proposed as part of the Proposed Project. Furthermore, the Proposed Project would maintain compliance with federal, state, and local statutes and regulations related to solid waste and utility services. While all utilities are currently available at or adjacent to the site, the Project will result in the relocation and construction of all onsite utilities. This will occur as part of demolition and regrading of the entire site and as operational details become further defined. The construction impacts of relocating utility lines will not result in impacts different than the reconstruction of the entire Project site, as is proposed. Standard construction methods will minimize potential impacts.

Once the Project's industrial, domestic, and fire water demands are confirmed, coordination with the HBMWD will be necessary to determine if modifications to the system will be needed. The site's fire water system and source are not defined because the fire water demand is not yet known. A water storage tank and emergency fire pump may be needed to obtain the required fire flow for the Project, so space has been reserved for these features.

Evaluation of the wastewater treatment capacity at the Samoa WWTF will be required. Expansion of this facility may be needed in order to support this project. It is expected that there will be two sanitary sewer lift stations that will be connected to the buildings on site and routed to the Samoa Wastewater Treatment Facility (WWTF). Further coordination with the Town of Samoa and Peninsula Community Services District (CSD) may be needed to confirm that these entities have the capacity to provide the needed services for this project.

For all these utilities, will serve letters should be obtained prior to circulation of the Draft Environmental Impact Report.

b. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?

The EIR will examine if adequate industrial and potable water supplies are available adjacent to the site and adequate for the needs of this project. Water needs are projected to be less than that which was utilized for the former industrial activities. A design to accommodate fire flows/storage will be needed when specific operational improvements are known. While ample water supply seems available, the EIR will examine the following topics:

- The total water demand and its demand schedule
- The amount of water that is anticipated to be treated water and industrial "raw" water

- If sufficient water supplies are available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry year
- How water infrastructure improvements will be funded

c. Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

The EIR will analyze operational aspects of the Project that affect wastewater discharge type and volume. Wastewater treatment will be done by an onsite package plant that will be able to add treatment cells to expand capacity. Disposal per the ocean discharge, in combination with Nordic, will also be assessed.

d. Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

The EIR will evaluate solid waste disposal for operations and construction, including for creosote piles that will be removed. If waste disposal amounts are beyond capacity of the local franchise, there may be a need to self-transport solid waste to Dry Creek Landfill or Anderson Landfill. The EIR will also evaluate disposal of dredge spoils. It is likely that the effect is Less Than Significant with Mitigation.

e. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

The EIR will analyze details about solid waste disposal for operations and waste disposal for construction, including for creosote piles that will be removed. If waste disposal amounts are beyond capacity of the local franchise, there may be a need to self-transport solid waste to Dry Creek Landfill or Anderson Landfill. Discussion should also include disposal of dredge spoils if not covered elsewhere; a different impact determination may be needed for that topic.

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XX. Wildfire

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:					
a.	Substantially impair an adopted emergency response plan or emergency evacuation plan?	☒	☐	☐	☐
b.	Due to slope, prevailing winds, and other factors, exacerbate wildfire risks of, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☒	☐	☐	☐
c.	Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines, or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts on the environment?	☒	☐	☐	☐
d.	Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☒	☐

Affected Environment

Emergency response plan/emergency evacuation plan

The Project Site is primarily surrounded by low grass and shrub vegetation for most of its perimeter and is generally flat. Small grass fires occur regularly on the Samoa peninsula, though the destruction of structures resulting from such fires is rare as they are typically extinguished quickly. Because of the large amount of surface paving, including internal circulatory roads, there are few instances where vegetation is located immediately adjacent to existing or proposed structures. The Project will meet all applicable state/local fire codes and will be fully compliant in providing new on-site water storage and fire hydrants as required.

The Humboldt County Emergency Operations Plan (Humboldt County 2015) and the Tsunami Inundation Map for Emergency Planning – County of Humboldt (CGS 2020) indicates that the proposed facility would not impair emergency response activities nor established evacuation routes. Emergency response/ emergency evacuation is further addressed in Section 3.10 (Hazards and Hazardous Materials).

The Proposed Project contains two major access roads leading to New Navy Base Road. These existing roads were designed to handle employee traffic from two former pulp mills. From there evacuees can cross Highway 255 bridge into the City of Eureka or head north to Arcata via Samoa

Boulevard. Sheltering in place at the nearby Samoa Cookhouse property is also a valuable contingency depending on the emergency.

Installation of Infrastructure (roads, emergency water sources, power lines or other utilities)

The Project Site and vicinity are not forested, and the site is not located in a remote area. The eastern portion of the Project Site is bordered by Humboldt Bay and as such pose no risk of wildfire. The local roads and New Navy Base Road serve as existing fuel breaks, as does the surrounding pavement and paved perimeter circulatory roads. The site is serviced by industrial water supply via Humboldt Bay Municipal Water District and emergency water sources exist on-site. The Project includes designing a new fire flow distribution system and hydrants to meet the needs of the Project. The Project site is also serviced by existing power lines which will be realigned, and in some instances proposed to be placed underground. No new power lines would need to be built to supply the Project.

Expose people or structures

The proposed Project is located on a site with a very gentle slope (<2%) that poses no downstream flood or landslide risk. There is no tributary on the Project Site to cause or contribute to post-fire flooding or subsequent erosion or mass wasting. The Project Site is and would continue to be largely covered in impervious surface that would not erode. The area surrounding the Project Site could be susceptible to a grassland fire. However, the facility would be protected by paved perimeter circulatory roads and on-site fire defense utilities required by building code, such as fire hydrants. In the event of a fire, post-fire slope instability or drainage changes would not occur, as the Project Site is nearly flat and does not include any natural drainages.

As a part of their assessment, California Department of Forestry and Fire Protection's (CAL FIRE's) Fire and Resource Assessment Program (FRAP) was developed to assess potential wildfire hazards on a landscape level which can aid land management planners in determining appropriate strategies for fuels reduction and aid county and local officials in determining appropriate mitigation strategies for communities. The California Department of Forestry and Fire Protection's (CAL FIRE) Fire Hazard Severity Zone maps (CAL FIRE 2023) evaluate the likelihood that an area would burn over a 30- to 50-year period. These maps are used to inform building construction standards on building permits, natural hazard disclosure at time of sale, defensible space clearance around buildings, and property development standards, such as road widths, water supplies, and address signs.

The FRAP mapping process has been incorporated into the Humboldt County General Plan (Humboldt County 2017) and the updated Safety Element (HCSE 2023), which shows that the western portion of the county, along the Pacific Coast in general, as having a mosaic of Fire Hazard Severity Zones (FHSZ) ranging from "Unzoned" to "Moderate" and "High" (CALFIRE 2023). For the Samoa Peninsula, the FHSZ are predominantly Moderate, with areas of High FHSZ clustered around the Samoa Cookhouse and vegetated areas to the north. Most of the Project Site is designated as Unzoned. The Project Site is therefore not located in or near federal or state responsibility areas or lands classified as very high fire hazard.

The proposed Project area is served by a variety of urban and wildland fire agencies including Peninsula Community Fire District, Arcata Fire Protection District, CALFIRE, as well as other local area fire departments under mutual-aid services. The Peninsula Community Fire District is a

volunteer fire service that maintains stations located in the community of Samoa and Fairhaven. (SCSD)

The County of Humboldt uses the Operational Area Emergency Operations Plan (EOP) to respond to major emergencies and disasters. The plan identifies a broad range of potential hazards and a response plan. In addition to the Operational Area EOP, the Proposed Project would be required to comply with applicable requirements set forth by the County of Humboldt Office of Emergency Services (OES), Humboldt County Sheriff's Office, and Humboldt County's special fire districts, such as requirements related to evacuation during wildfires. The OES provides coordination of emergency response at the local level in the event of a disaster, including wildland fires. The Proposed Project would comply with the Humboldt County Operational Area Hazard Mitigation Plan and the Humboldt County OES. The Proposed Project would not substantially impair an adopted emergency response plan or emergency evacuation plan.

Regulatory Setting

Federal

Humboldt County has an adopted Humboldt County Operational Area Hazard Mitigation Plan as identified below. Federal Emergency Management Agency (FEMA) approved the Humboldt Operational Area Hazard Mitigation Plan on March 20, 2014

State

The California Public Resources Code (PRC) sets forth fire safety regulations for applicable projects that include the following:

- Earthmoving and portable equipment with internal combustion engines must be equipped with a spark arrestor to reduce the potential for igniting a wildland fire (PRC Section 4442).
- Appropriate fire suppression equipment must be maintained during the highest fire danger period – from April 1 to December 1 (PRC Section 4428).
- On days when a burning permit is required, flammable materials must be removed to a distance of 10 feet from any equipment that could produce a spark, fire, or flame, and the construction contractor must maintain the appropriate fire suppression equipment (PRC Section 4427).
- On days when a burning permit is required, portable tools powered by gasoline-fueled internal combustion engines must not be used within 25 feet of any flammable materials (PRC Section 4431).

California has developed an emergency response plan to coordinate emergency services provided by federal, state, and local government agencies. Responding to hazardous materials incidents is a part of this plan. The plan is administered by the State OES, which coordinates the responses of other agencies such as local fire and police agencies, emergency medical providers, California Highway Patrol (CHP), the California Department of Fish and Wildlife (CDFW) and Caltrans.

Local

Humboldt County has an adopted Humboldt County Operational Area Hazard Mitigation Plan which was approved by FEMA on March 20, 2014.

Discussion

a. Substantially impair an adopted emergency response plan or emergency evacuation plan?

The Project is located approximately 13 miles from the nearest state responsibility areas or lands classified as very high fire hazard severity zones. The Project site was previously utilized for a pulp mill operation and was developed to industrial standards including adequately sized access roads and firefighting water distribution systems including hydrants. This will be redesigned to accommodate large equipment and fire flows/storage needed to fight fires. The addition of the Project into a non-designated fire severity zone will not impact the evacuation of project workers, as well as the existing surrounding population (e.g., workers, residents, visitors) in the area. Emergency responders will continue to have the ability to simultaneously access the area to fight wildfires.

b. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks of, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

The Proposed Project would comply with the County of Humboldt's Multi-Jurisdictional Local Hazard Mitigation Plan, which includes strategies to reduce the loss of life, personal injury, and property damage that can result from disasters, including wildfire. All activities under the Proposed Project would be required to comply with applicable construction and design standards that ensure the incorporation of fire prevention features. Although fire can be a potential threat in some areas of the Project site, the Project would not include housing or commercial development and would not draw a substantial number of people to the area during construction or operation activities.

c. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines, or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts on the environment?

The Project site is adequately sited to provide natural and improved fire breaks to reduce the spread of fires. Section XIX Utilities presents information on the need for the EIR to assess the adequacy of water supplies and infrastructure which includes addressing firefighting within the Project site. Additional analysis is needed once operational activity has been defined. This additional analysis should consider the potential loss of water pressure during a fire, which may decrease available water supply and the potential loss of power, which may eliminate the supply.

d. Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

The Project site is generally flat with no water courses and will not be subject to post-fire erosion or instability. The Project will result in a compacted fill site with stormwater runoff controls.

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XXI. Mandatory Findings of Significance

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a.	Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	☒	☐	☐	☐
b.	Does the project have impacts that are individually limited but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	☒	☐	☐	☐
c.	Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☒	☐	☐	☐

Affected Environment

This section considers briefly whether the proposed Project could result in impacts that fall within the mandatory findings of significance.

Discussion

a. Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?

Potential impacts on biological resources could be substantial. This will be evaluated in the EIR. See above Section IV for more detail.

b. Does the project have impacts that are individually limited but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable

when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)

The EIR will assess the impacts of the proposed Project in combination with other projects to determine if the Project will contribute to cumulative impacts beyond those directly resulting from the proposed Project.

c. Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?

The proposed Project could have substantial impacts on people, including impacts related to air emissions, noise, or hazardous materials. The EIR will assess these impacts. See above Sections III, IX, and XIII for more detail.

Chapter 3
List of Preparers

The California Environmental Quality Act (CEQA) Lead Agency for this Initial Study (IS) is the Humboldt Bay Harbor Recreation & Conservation District.

This IS was prepared for the Humboldt Bay Harbor Recreation & Conservation District by the following entities.

- Moffatt & Nichol (overall project management and engineering).
- ICF (lead on environmental analysis and document development, including all sections not listed for other firms)
- SHN (environmental analysis for all sections not listed for ICF)
- WTrans (transportation)

This chapter lists the primary individuals who prepared the EIR.

Lead Agency

Humboldt Bay Harbor Recreation & Conservation District

Executive Director	Chris Mikkelsen
Development Director	Robert Holmlund

List of Key Preparers

Moffatt & Nichol

Project Management

Project Manager	Shane Phillips
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Engineering

Project Engineer	Michael Jokerst

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Project Management

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Technical Analyses

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Biological Resources	Bob Brown, AICP
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Population and Housing	Bob Brown, AICP
Public Services	Bob Brown, AICP
Recreation	Bob Brown, AICP
Tribal Cultural Resources	Bob Brown, AICP
Utilities and Service Systems	Bob Brown, AICP
Wildfire	Bob Brown, AICP

Wtrans

Technical Analyses

Transportation

Appendix A

Project Description and Figures

Appendix A
Chapter 2 Project Description

2.1 Introduction

The Humboldt Bay Harbor, Recreation and Conservation District (Harbor District) 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. 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 includes both landside and waterside components. The Project will primarily serve as a facility for the vertical integration, launching, and long-term maintenance of fully assembled wind turbine generators (WTG). The terminal will also serve as a facility for the manufacturing, importing, staging, and preassembly of various WTG components, including assembly of WTG floating foundations.

Construction of the Project will include marine infrastructure and upland improvements, demolition of all existing structures on the Project site, and relocation of three existing uses (mariculture, commercial fishing equipment storage and a commercial fish landing/live-holding facility) to offsite locations. Additionally, the Project includes habitat restoration to mitigate for impacts on (1) freshwater wetlands, environmentally sensitive habitat areas (ESHA), eelgrass (*Zostera marina*), Osprey (*Pandion haliaetus*) nests, and fish and marine mammal species; (2) conversion of intertidal to subtidal habitat; and (3) increased benthic cover. Construction will be completed in phases; Phase I is anticipated to begin in 2026 and be completed in 2030, based on a 3.5 month in-water work window each year. A lengthened in-water work window is being considered and will allow construction to be completed in fewer years.

2.2 Project Background

The federal government has established a goal of deploying 30 gigawatts (GW) of offshore wind energy by the year 2030 and 110 GW by the year 2050. The State of California has established goals of deploying 5 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 the federal and State 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 installation, the West Coast ocean floor is much deeper, and floating platforms 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 possible. Therefore, port infrastructure is an essential part of achieving the OSW goals. Additionally, open water construction is not practical; therefore, platforms, towers, and blades must be constructed within ports and towed out to wind farms fully assembled.

The terminal will primarily serve as a facility for the manufacturing, import, staging, preassembly, and loadout of large OSW components. The marine infrastructure and upland improvements are required to prepare the Project site for use by offshore wind developers. While the OSW industry is the proposed anchor tenant of the modernized port facilities, in the future, the multipurpose facilities could accommodate other uses.

2.3 Project Objectives

The objectives of the Project are as follows.

- 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 renewable energy development.
- Develop a facility that can contribute to the federal goal of deploying 30 GW of offshore wind energy by the year 2030 and 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, onsite renewable energy generation, green building materials, the electrification of terminal operations, 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.

2.4 Project Location and Setting

2.4.1 Project Location

The Project is located on the Samoa Peninsula in Humboldt Bay (**Figure 1**). Humboldt Bay is California's second largest bay, located 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.

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, and 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.

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

2.4.2 Project Site and Environs

2.4.2.1 Project Site and Existing Conditions

The Project site is approximately 180 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 figure showing the location of former operations and structures is provided in **Figure 2**. Louisiana Pacific historically occupied the site as part of the Louisiana Pacific 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: 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 and cars, coastal rip rap, roadways, asphalt work areas, industrial stormwater management infrastructure, and degraded industrial foundations and buildings 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.

2.4.2.2 Areas of Potential Concern

Known releases of hazardous substances have occurred at the site that have undergone investigation and cleanup under the oversight of the North Coast Regional Water Quality Control Board (RWQCB). Areas previously investigated for release and cleanup include fuel storage facilities and wood treatment with fungicide application (**Figure 2**). The primary constituents of concern in these areas are petroleum hydrocarbon and their associated constituents (for example, diesel, motor oil, gasoline and benzene) and pentachlorophenol, a polycyclic aromatic hydrocarbon (PAH). There are currently no active cases under regulatory oversight requiring investigation and cleanup at the Project site.

Additional areas of the site with the potential for contaminants include the former refuse burners in the northern portion of the site (dioxin/furans and PAHs), former structures with industrial use (fuels and lubricants), and existing structures that may contain asbestos and lead-based paint. General areas of lesser concern include the use of dredge material as fill on the site, utility/conveyance lines that may act as a preferential pathway for released materials, and the potential of elevated metals in soils where storage of materials from salvage operations may have occurred.

The EPA is currently implementing a Phase I Environmental Site Assessment (ESA) which will be followed by a Phase II assessment. 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.

2.4.2.3 Project Site Land Use Designations

The Project is located entirely in the California Coastal Zone, within the jurisdiction of the County of Humboldt and the California Coastal Commission (CCC), and is subject to the Humboldt Bay Area Plan (HBAP), a component of the Humboldt County Local Coastal Program (LCP). The western portion of the Project site (referred to as the inland or backlands in this document) is within the jurisdiction of the County of Humboldt and in an area appealable to the CCC. In contrast, the eastern portion of the project site, along Humboldt Bay, is within the area of retained jurisdiction of the CCC (**Figure 3**).

The Project site has four Humboldt County land use designations, Industrial (MC and MG), Natural Resource (NR), and Commercial (CR). The majority of the upland development is within the combining zone of Industrial, Coastal Dependent (MC/A) (**Figure 4**). The 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 and provides for "reasonable mitigation measures where development would have an adverse impact upon archaeological and paleontological resources" (Humboldt County 2017). 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 and there is an area of apparent mapping error where NR/W zoned parcel extends onto developed uplands (**Figure 4**). The Project site includes parcels identified by assessor parcel numbers (APN) 401-031-040, -054, -055, -061, -070, -071, -077, -078; and 401-112-011, -012, -013, -024, -029, -030.

2.4.2.4 Existing Tenants

There are existing tenants in the Project area that will be relocated as part of the proposed Project. The existing tenant's uses that will be relocated include shellfish and seaweed mariculture, commercial fishing equipment storage and hagfish (*Eptatretus stouti*) landing / live holding. (**Figure 7**).

2.4.2.5 Neighboring Land Uses

To the south of the Project site 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, various upland tenants, and the proposed 660,000 square foot Nordic Aquafarms Land-Based Aquaculture Project. To the north and west of the Project site is the town of Samoa (Samoa), which includes planned and existing residential development, and to the east is Humboldt Bay.

2.5 Project Components

The Project includes both landside and waterside components as part of the redevelopment of the Project site into a multipurpose, heavy-lift marine terminal facility (**Figure 5**).

2.5.1 Overview of Operations

2.5.1.1 Permitted Operations

The Project site will primarily serve as a facility for the staging, vertical integration, launching, and long-term maintenance of fully assembled WTGs. Additionally, WTG foundations will be assembled at the site. These are referred to as permitted operations because these will be included in permit applications submitted in 2024. Permitted operations comprise the project analyzed in this EIR.

Based on the size of the terminal and number of WTG vertical integration sites required to meet the state's renewable energy goals, two WTG staging and vertical integration sites will be constructed at the Project site to allow for the simultaneous construction of two OSW projects out of the terminal. Each contains 60 acres of upland space and a heavy lift wharf for delivery vessels (one 1,100-foot and one 1,600-foot), as well as other component infrastructure (**Table 1**).

In addition to the two Staging and Integration Sites, a Floating Foundation Assembly Site is included in the remaining 60 acres (**Figure 5**). This will provide significant economic benefits and job creation as well as operational efficiencies. The Floating Foundation Assembly Site will have 400 feet of dedicated berth space for foundation launching and access to a shared berth for delivery of subcomponents.

These project components are described in detail in this section and shown in **Figure 6**. As described in Chapter 1, *Introduction*, the Harbor District is proposing to approve and implement specific activities (structure demolition, construction and Project operations) related to OSW development, and this environmental impact report (EIR) evaluates these specific activities at a project level.

2.5.1.2 Future Operations

Other projects may occur at the terminal site in the future but are not yet designed or proposed to be constructed or operated. These are referred to as Future Operations. Future Operations could include the terminal also serving as a facility for the manufacturing, import, staging, and preassembly of various WTG components.

Future Operations will occur later than Permitted Operations and are not a part of the proposed project. Not enough detail regarding the Future Operations is currently known to include them in the initial permit applications or project level CEQA documentation.

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, 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.

2.5.2 Proposed Uses in Development Subareas

Four subareas are delineated within the Project site according to the type of construction and operational activity that will occur within them (**Figure 6**). These include the Upland Development Subarea, The Marine Development Subarea, the Wet Storage Subarea, and the Habitat Mitigation Subarea.

2.5.2.1 Upland Development Subarea

The Upland Development Subarea is landward (west) of Humboldt Bay. All nonmarine development will occur in this area (**Figure 6**).

Offshore Wind Terminal Operations

Offshore wind terminal operations will include general WTG staging and integration operations. This includes the use of crawler cranes and two fixed position quayside ring cranes[1]; loading and unloading of turbine components via ships; marine terminal import of WTG components, such as blades, towers, floating foundations, and other turbine components; as well as turbine device mooring equipment, such as anchors, mooring lines, and chains. **Table 1** summarizes staging and integration site component infrastructure.

Staging and Integration Operations

Table 1. Staging and Integration Site Component Infrastructure

Staging and Integration Site 1—Infrastructure	Staging and Integration Site 2—Infrastructure
1,600-ft Heavy Lift Wharf:	1,100-ft Heavy Lift Wharf:
(1) 400-ft integration berth	(1) 400-ft integration berth
(1) 400-ft pre-commissioning berth	(1) 700-ft delivery berth (shared with adjacent Foundation Assembly site)
(1) 800-ft delivery berth	(1) quayside ring crane

[1] Anticipated design is similar to that of a Mammoet PTC200-DS ring crane. Approximate height of the boom tip will be 800-feet to accommodate a working point of approximately 600-feet while assembling large size WTGs.

Staging and Integration Site 1—Infrastructure	Staging and Integration Site 2—Infrastructure
(1) quayside ring crane Load rating = 6,000 psf	Load rating = 6,000 psf
60-Acre Uplands: (1) 20,000 sq ft office building (1) 50,000 sq ft storage / assembly building (1) 90,000 sq ft parking area Laydown area for WTG components Load rating = 3,000 psf	60-Acre Uplands: (1) 20,000 sq ft office building (1) 50,000 sq ft storage / assembly building (1) 90,000 sq ft parking area Laydown area for WTG components Load rating = 3,000 psf

ft = feet; psf = pounds per square foot; sq ft = square feet; WTG = wind turbine generators.

Wind Turbine Generator Components Delivery and Storage

WTG components will be delivered at the delivery berth (Staging and Integration Site 2 shares delivery berth with the Foundation Assembly Site). WTG components will be temporarily stored in upland areas as shown on **Figure 5.** Blades will be stacked in sets of three, and towers will be stored horizontally or vertically. Nacelles will also be stored prior to vertical integration of the WTGs.

Foundation Delivery and Storage

Two potential scenarios may be utilized for foundations. The goal is to manufacture the foundations on site. The Project is being designed for onsite foundation manufacturing, but initially some foundations may be built at another location.

- Scenario 1: Foundations will be sourced from the onsite Foundation Assembly Site and launched with a semi-submersible barge. A sinking basin, approximately 60 feet deep, will be constructed for this purpose. The foundations will be assembled in the upland areas, moved across the quay onto a semi-submersible barge with self-propelled modular transporters (SPMT). Then the barge will be moved to the sinking basin using tugs and submerged. The foundation will then float off the barge and be towed to wet storage with tugs or vertically assembled into a WTG and towed to sea.
- Scenario 2: Foundations will be fabricated at a separate location in the U.S. and towed to Humboldt Bay using tugs and then placed in wet storage. Alternatively, foundations will be fabricated in Europe or Asia and delivered to a separate location in the U.S. via a semi-submersible vessel, floated off the heavy lift vessel, and then towed to Humboldt Bay by tugs and placed in wet storage.

Vertical Integration

- WTG foundations, from wet storage, will be brought to the integration berth by tugs.
- WTG components will be moved from uplands storage to the quayside pre-assembly area by SPMTs and integrated onto the foundation by a quayside crane.
- Once fully assembled, the integrated WTG will be moved to the pre-commissioning berth for pre-commissioning activities.
- After pre-commissioning is completed, depending on weather and towing conditions, the WTG will be towed directly to the offshore installation site (good weather window) or towed to the

southern WTG wet storage area (impermissible weather window) until a good weather window is available for tow-out to offshore installation site.

Floating Foundation Assembly Site Infrastructure and Operations

As described in Scenario 1, ultimately, WTG foundations will be assembled on site. Following is the process for delivery of foundation subcomponents, subcomponent storage, foundation assembly, and foundation loadout. **Table 2** summarizes Floating Foundation Assembly Site infrastructure.

- Completed foundations will be moved to either wet storage area by tugs.
- Foundation subcomponents will be delivered at a 700-foot delivery berth, shared with adjacent Staging and Integration Site 2 (**Figure 5**).
- Foundation subcomponents will be temporarily stored in upland areas. The quantity, storage configuration, and storage location will differ depending on the foundation technology being utilized. Foundations may be semi-submersible (made of steel or concrete) or tension leg platform foundations.
- Foundations will load-out at the 500-foot load-out berth (**Figure 5**) using one of the following options.

  Option 1—Semi-Submersible Barge: SPMTs will load the WTG foundation onto a semi-submersible barge at the quay. The barge will move to the sinking basin, ballast down until the foundation is floated off, and then the foundation will be towed by tugs to the integration berth or to foundation wet storage. A sinking basin approximately 60 feet deep will be constructed for this purpose.

  Option 2—Direct Transfer with Crane: A quayside crane will lift the assembled foundation from the quayside into the water. Tugs will attach to the foundation in the water and tow it to the integration berth or to foundation wet storage. Due to the significant size and weight of the foundations, this option will be infeasible for the majority of foundation designs.

Table 2. Floating Foundation Assembly Site Infrastructure

500-Ft Heavy Lift Wharf:
(1) 500-ft load-out berth
(1) 700-ft delivery berth (shared with adjacent Staging and Integration Site 2)
Load rating = 6,000 psf
60-Acre Uplands:
(1) 20,000 sq ft office building
(1) 50,000 sq ft parking area
Laydown area for foundation subcomponents
(2) assembly lines – moving from the back of the site towards the wharf – for WTG foundation assembly (exact method of assembly, quantity, and orientation of production lines will differ depending on foundation technology being utilized).
Load rating = 3,000 psf

psf = pounds per square foot; sq ft = square feet.

Tenant Relocation

Commercial Fishermen 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 7**). This area on Woodley Island will be graveled and fenced. Additionally, the Woodley Island Marina work dock (**Figure 8**) 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 7**). The facility includes a bay water intake and discharge. This facility will be relocated to an offsite location that has not yet been identified.

2.5.2.2 Marine Development Subarea

The Marine Development Subarea extends from the top of the bank into the bay to the federal navigation channel. Assembly and launching 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 off-terminal wet storage that will occur in the Wet Storage Subarea (**Figure 6**).

Proposed Uses

Tenant Relocation: Mariculture Operations

There are current shellfish and seaweed farms within the Marine Development Subarea (**Figure 7**). 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.

Dredge Material Dewatering Area (Samoa Lagoons)

The Project includes berth areas and wet storage areas, all of which will need to be initially dredged and then periodically re-dredged in the future (known as *maintenance dredging*). Each maintenance dredging event will generate substantial amounts of dredge material (See Section 2.6.7, *Dredging*) that will be beneficially used or disposed.

As shown in **Figure 9**, an existing dredge material dewatering area is located just north of the Upland Development Subarea. Known as the *Samoa Lagoons*, this site has a capacity to hold approximately 65,000 cubic yards of dredge material. It was designed and constructed to receive dredge materials, drain residual water back to the bay, and then temporarily store the dried sediment. The de-watered dredge material can then be hauled off site for beneficial use or disposal. The site was originally used as a dewatering and storage site for the dredging of a berth to the east of the Samoa dock that is scheduled to be demolished as a part of the Project (**Figure 2**). The Project will re-open the Samoa Lagoons Dredge Materials Dewatering Area to be used for either the initial dredging and/or the maintenance dredging of the proposed berths and wet storage areas. The

project will also either amend existing permits associated with the Samoa Lagoons site or acquire new required permits. The Habor District has a County Coastal Development Permit (CDP) / Conditional Use Permit (CUP) (CDP-10-12/CUP-10-09) for the 21-acre site that allows up to 65,000 cubic yards of dredge material to be dewatered and temporarily stored at this site. The site was originally permitted and was used in the 1980's and 1990's. It is anticipated that the dewatering area will required improvements including: regrading, lining as necessary, and a decant system may be overhauled or replaced.

2.5.2.3 Wet Storage Subarea

Within the Wet Storage Subarea, areas for short-term temporary mooring (staging) of WTGs (referred to as *wet storage sites*) will be developed (**Figure 6**).

Proposed Uses

Wet storage areas will be used for floating foundations storage prior to vertical integration into assembled WTGs and temporary staging of the assembled WTGs (floating foundation, tower, nacelle, and blades) prior to towing them to sea. Wet storage allows production to continue until an adequate towing weather window is available. Two potential wet storage areas have been identified: North Wet Storage and South Wet Storage (**Figure 6**). Due to proximity to the bridge, the northern area can be used for wet storage of foundations only, not turbines. The southern area will be used for wet storage of foundations and assembled WTGs.

Based on limited available space, a fixed mooring system will be utilized. This will limit the travel of foundations when at anchorage. Ballasting with supply water will be required to level and stabilize WTGs during offloading of the WTG floating foundations and during vertical integration. 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.
- WTG Tow-In Operations: for future maintenance of the WTGs, which requires towing them back to port for heavy lift service or tow-in delivery from another port, reversed ballasting operations may be needed depending on navigation requirements and what work is done on the WTG.

2.5.2.4 Habitat Restoration Subarea

In the Habitat Restoration Subarea, wetlands and environmentally sensitive habitat areas (ESHA) will be created and restored as mitigation for biological impacts in the Upland Development Subarea (**Figure 6**).

Proposed Uses

The Habitat Restoration Subarea includes areas that are ruderal and dominated by nonnative invasive plant species. Habitat restoration, including estuarine and freshwater wetland establishment, will provide onsite mitigation for some of the project impacts on wetlands and ESHAs and accommodate some relocated osprey nests (**Figure 10**). Habitat restoration will develop a

mosaic of habitat types that is significantly higher quality than what will be affected by the Project's upland development. This is because wetlands within the mitigation area have developed for a longer period of time due to earlier abandonment of activities in that subarea. However, the existing wetlands in the Habitat Restoration Subarea are characterized by fill substrates, nonnative and invasive species in the understory, and in many cases are artificially induced as a result of past industrial development. Estuarine wetlands along Humboldt Bay in the mitigation area are high quality and support special-status salt marsh species and sensitive salt marsh habitat.

Based on the conceptual mitigation plan developed for the onsite mitigation area, 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 restoration activities. Estuarine and freshwater channels will be excavated to meet design specifications for tidal influence and to be adaptable to anticipated sea level rise. The freshwater wetlands will be hydrologically connected to the estuarine wetland via a tide gate and culvert under the Project access road. Freshwater wetland creation will consist of excavating an area that is currently upland fill to suitable depths to allow for the development of freshwater wetland hydrology and establishment of native hydrophytes. Additional areas will be planted with a diverse pallet of native wetland plants which will provide higher quality habitat and substantial functional lift.

2.6 Construction and Demolition

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 Project site.

2.6.1 Project Phasing and Schedule

2.6.1.1 Phasing

Overall site development will occur in multiple phases as shown on **Figure 11** and will follow the schedule shown in **Table 3**.

- Phase 0 will consist of developing access corridors and performing onsite mitigation/habitat restoration.
- Phase 1 will consist of developing the northern portion of the site and creating a wet storage area. Phase I construction is anticipated to start in 2026 and be completed by the end of 2030.
- Phases 2 and 3 will consist of developing the southern portion of the site and creating an additional wet storage area. The Foundation Assembly Site will likely follow at a later date.

2.6.1.2 Construction Schedule and Hours

Table 3. Construction Schedule

Milestones	Duration	Completion
All permits in hand		July 1, 2026

Milestones	Duration	Completion
Constraints		
In-Water Work Window	July 1–October 15 each year	July 1, 2030
Assumptions		
Marine Construction Work Hours	12 hours per day	
Marine Construction Workdays	6 days per week	
Dredging Work Hours	24 hours per day	
Dredging Workdays	7 days per week	
Upland Work Hours	12 hours per day	
Upland Workdays	7 days per week	

2.6.2 Construction Access and Material Delivery

2.6.2.1 Construction Access

Construction access will be from both the land and water to the Project site. Two access points will be constructed during Phase 0 and used during Phase 1 and 2 (**Figure 11**). The North Entrance will be at the north end of the site and accessed off of Vance Avenue. The West Entrance will be at the south end of the site and accessed via the West Access Road that connects to New Navy Base Road.

It is expected that any large deliveries, such as crane components and piles will be delivered through the West Access Road or from barge. A construction road on site will need to be maintained at all times to allow for unobstructed movement on site. The Contractor will be responsible for this and will need to coordinate with all subcontractors to avoid blocking access to work. Smaller deliveries and construction workforce will likely use the North Entrance to gain access to the site but may use the West Access Road if certain work makes this access impractical or unsafe.

The waterfront construction will be accessed directly from Humboldt Bay via tugs and barges. Due to the shallow depths near shore, the Contractor will likely need to perform some amount of the planned dredging to gain closer access to the construction site. Crew boats will be utilized to transport the workforce to the floating equipment.

The Contractor will be required to liaise directly with the appropriate local authorities, such as the police, California Department of Transportation (Caltrans), 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 liaise with the appropriate local authorities such as the U.S. Coast Guard and the Humboldt Bay Harbor District with respect to marine access and mobilization of floating equipment (i.e. derrick barges, flat barges, hydraulic dredges, and tugs) to the site.

2.6.2.2 Material Delivery

Dense grade aggregate will be transported to the Project site via barge and truck. Larger quantities used for the wharf and backlands will likely be supplied via barges, while smaller quantities will be delivered via truck. The material will be offloaded from the barge into the backlands either via a derrick barge and bucket, or a barge that has an integrated conveyor system that can offload material directly.

The steel piling can either be brought to the Project site in full lengths via a material barge or in smaller sections by truck and 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 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 to ensure the material barge can be used to receive the next load of piles.

2.6.2.3 Equipment Delivery

Water based equipment will be tied down and brought to the site. Once on site, the equipment will be unlashed and made ready for service. Land-based equipment will be brought onto the site via 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.

2.6.3 Soil Improvements

The backlands are required to be consolidated via 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, PVD) will be installed to facilitate the movement of pore water out of the soil. See 2.6.7.1, *Soil Preloading Surcharge*.

2.6.4 Staging

The Project will require onsite staging areas for the Contractor and subcontractors to accommodate Contractor temporary offices, material storage and stockpile areas, maintenance equipment and 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 Project as the preload surcharge area moves. Schedule permitting, materials could wait to be stockpiled until after the first surcharge area is completed to avoid rehandling.

Additionally, the Contractor will require designated water access staging, and water laydown areas for derrick barges, dredges, material barges, tugs, and crew boats. The Contractor may request to install multiple mooring points in the Project water work limits to attach vessels, barges, or floating equipment via temporary anchored buoy locations. The water access staging can either be a gangway and float which connects to shore on site, or the Contractor may make use of the existing marinas in the area in which case the floating equipment's crew will park off site.

2.6.5 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, installation of a temporary mooring system to allow for offloading of dense grade aggregate via barge may be necessary if the schedule does not permit use of the newly constructed wharf.

2.6.5.1 Concrete Batch Plant and Material Storage

A concrete batching plant is used to manufacture concrete from its ingredients, including cement, crushed stone, sand, water and admixture chemicals. Concrete mixtures are manufactured based on engineering project specifications. Concrete mixture specifications vary by altering the proportion of various raw materials. Concrete work will use a combination of offsite batch plant and onsite batch plants. Up to two concrete batch plants will be installed onsite. Stockpiles will be located immediately adjacent to the batch plant, allowing for easy access to materials. Water provided by the Humboldt Bay Marine Water District (HBMWD) will also be used for batch plant operation.

2.6.6 Demolition

The Project will require demolition of various structures in the backlands as well as the existing onsite timber wharf structure and remaining pilings. All existing facilities on the Project site will be demolished (**Figure 13**). The demolition phase 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).
- Disposal of treated wood waste.
- Removal of debris along rock slope, and regrading of slope as required.

The backland structures will be removed using excavators and other equipment (graders, loaders, backhoes, etc.) to demolish and process the structures. The processed materials will be sent via truck to various landfills depending on the material type and their hazardous classification. Concrete demolition will consist of a combination of onsite reuse, offsite recycling, and offsite disposal.

The timber 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 from the water using a floating crane. In this scenario, a floating crane and a water side crew using a combination of work boats (or skiffs) and work floats for access underneath the wharf will work in tandem to rig the crane into sections of the wharf, then the water side crew will use a saw to disconnect the rigged up section from the remaining structure. The removed section will be placed onto 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 or other appropriate site for disposal.

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 will pull 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 which will oscillate and cause the pile to vibrate and liquefy the soil surrounding the pile 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 then sent to a landfill.

The existing grade near the timber wharf is too shallow for a floating barge or material barge to gain access after approximately the first 60 feet are removed (measuring from the face of the wharf

towards the backlands). Therefore, the Contractor will remove the deck and piles where it can reach, then dredge the exposed area enough to allow barge access (approximately 6 feet). The Contractor can then move the barges over the newly dredged areas to reach more deck and repeat the process until complete. The area of demolition is large enough that a demolition focused crew and a dredge crew can work simultaneously for efficiency.

2.6.7 Site Grading

Roughly 170 acres of backland will be graded to provide protection against future sea level rise, provide laydown area for the windfarm components, be compacted to sustain the loads of the equipment that will move the components around, and provide positive drainage to the proposed stormwater collection facilities (**Figure 14a**).

The Project site will be raised to an elevation of at least 16 feet to accommodate sea level rise for the design life of the project components. In addition, to avoid collection of drainage within the interior of the site, a high point ridgeline will run in the north-south direction. The ridgeline elevation will vary from an elevation of 18 feet at the north end of the site to an elevation of 20.5 feet at the south end of the site (**Figure 14b**). This will promote stormwater runoff at an approximately 0.5% slope in the east-west direction along the perimeter of the site (**Table 4**). A gentle slope is required to provide laydown area for the windfarm components.

Table 4. Summary of Grading Design Criteria

Minimum Grade	0.5%*
Maximum Grade	1.5%*

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

The proposed elevations will generate a net cut of roughly 300,000 cubic yards within the entire Project site, excluding the North Access Road (**Figure 14a**). The net number does not account for shrinkage or bulking of material based on excavation, compaction, or surcharge. There could be a need to import fill from dredged material or other sources depending on the amount of usable material onsite and the timing of construction phases. Some export of excavated material may also needed. The grading surface will be the subbase for approximately 3 feet of dense graded aggregate (DGA) that will create the top surface.

Since the north half of the site has lower existing elevations, it will mainly consist of fill with a minor amount of cut along the west boundary of the site. The south half of the site had higher existing elevations and will mainly consist of cut with a minor amount of fill in the middle of the site and near the shoreline (**Figure 14a**).

2.6.7.1 Soil Preloading Surcharge and Wick Drains

The backlands are required to be consolidated via preloading 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 for 6 months. Wick drains (or prefabricated vertical drains) will be installed to facilitate the movement of pore water out of the soil. Surcharge soil could be comprised of reused soils from onsite, dredged sediment from the adjacent marine subarea if suitable, or imported material.

It is anticipated the Contractor will perform demolition, installation of any temporary utilities, and some amount of site regrading prior to beginning the wick drain operation. 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 and can be scaled back once the surcharge operation becomes the critical path.

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 specialty drilling rig to drill or auger the location of the wick drains to loosen the soil. If required, this operation will start prior to wicking in a given area and enough drill rigs will be required to not interfere with the required production rate of the wick drain installation. Drilling is slower than wick drain installation, so more drill rigs will be required than wick drain installation machines.

It is assumed that approximately 700,000 cubic yards surcharge will be built. Surcharge material is sandy fill that will ideally be placed into the backlands as a byproduct of the dredging operation. However, if adjacent dredge material is deemed not suitable, then this material will need to be brought in by truck or barge. Once built, the surcharge will remain in place for 6 months. Once the required settlement is observed, the surcharge will be moved to an adjacent footprint where it will sit for another 6-months. This process will be repeated until the needed areas are consolidated.

Once all of the preload operations are completed, excess material will be removed from the site or could potentially be left in a stockpile to supply the Phase 2 work. This decision will be influenced by permit requirements, the availability to leave the material stockpiles in the Phase 2 area, and how long it must remain in place before Phase 2 work begins.

2.6.7.2 Cement Deep Soil Mixing

To strengthen the near-shore soil properties adjacent to the Samoa Channel and reduce lateral spreading, cement deep soil mixing (CDSM) will be performed along the slope. 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 as well as inject cementitious grout and mix the soil as it is extracted. The drilling rig will be supplied by a small batch plant of water and grout in the immediate vicinity of the work. During this process, cement replaces as much as 40% of the native material and this residual spoil of cementitious soil becomes available for use onsite. This 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.

2.6.7.3 Dense Grade Aggregate (DGA)

The components and equipment that are anticipated to be used at this site will necessitate that the wharf can handle a 6,000 pound per square foot (PSF) loading and the backlands can handle a 3,000 PSF loading. This is a cost-effective solution compared to the likely alternative of some form of 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 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 14b**).

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

Based on a 3-foot section of DGA, up to approximately 48,300 cubic yards of DGA will be needed during Phase 0 of the project to build access roads to the site. It will not be needed on site again until after site preparation of the backlands for Phase 1 which could be multiple years after Phase 0 concludes. Due to the gap in time, it is most likely that the Phase 0 DGA will be brought to the site via trucking from a local source. The larger quantity of DGA used for the wharf and backlands would likely be supplied via a waterfront quarry and barges. This volume is estimated to be approximately 222,600 cubic yards in Phase 1 and 545,400 cubic yards in Phase 2, for a total of 816,300 cubic yards of DGA in Phases 0, 1, and 2.

Additionally, 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 to be filled with additional DGA as a maintenance action during Phase 1 and 2 of construction. This volume would most likely be supplied via truck from a local source and could total up to approximately 128,000 cubic yards if the entire backlands experiences 6 inches of settling. Therefore, the approximate maximum amount of imported DGA materials used in the backlands could reach 944,300 cubic yards during construction.

2.6.8 Dredging

2.6.8.1 Dredging Activities

Dredging activities will include the following.

- Dredge new berth pocket and wet storage footprints.
- Rehandle dredge spoils suitable for beneficial use into backlands for use as surcharge.
- Construct surcharge in backlands for use in pre-loading of soil.
- Perform CDSM soil improvement along shoreline.

It is expected the Contractor will need multiple pieces of equipment to increase the production rate; the waterfront site for Phase 1 and Phase 2 is only large enough to efficiently accommodate two to three pieces of floating equipment along with the support barges. It is expected the Contractor will have a combination of two to three dredges or derrick barges at a time during the construction phase. Additionally, 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 Project site. The Harbor District is also pursuing opportunities to beneficially use the dredged material for beach nourishment, habitat restoration, dike construction or other projects. The material must have the appropriate gain size and be tested

for contaminants for these uses to occur. A large portion of the dredge material will likely be disposed of at the Humboldt Open Ocean Disposal Site (HOODS).

Hydraulic dredging will be employed for bulk dredging where possible. Hydraulic dredging will not be used in areas where obstructions are expected such as large rocks, or timber pile remnants. Clamshell dredging is ideal for more precise work, or if obstructions are expected. 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.

To make full use of the in-water work window, dredging operations will work continuously 24 hours a day 7 days a week. The dredges will be crewed by either 2 crews working 12 hours, or 3 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.

As discussed in Section 2.6.5, *Demolition*, the timber wharf demolition will happen simultaneously with dredging to gain access. For this reason, it is anticipated there will be slow production for initial dredging operations near the existing timber wharf until all piles are removed. Conceivably, the Contractor will use two pieces of floating equipment to dredge and demolish the wharf. A third piece of floating equipment could simultaneously work on the remaining dredge footprint between the demolition front and the navigation channel. A fourth piece of floating equipment could work in the Wet Storage Subarea.

Clamshell Dredging

A pre-dredge survey will be taken of the Project site to determine how much material needs to be removed across the entire dredge limit. This information will be available to the clamshell dredge operator as a guide for how much material will be excavated within the Project area. The dredge along with a scow will be located into position via 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.

The clamshell method will be used for the initial pass of the dredge areas to remove newer fill that may contain contaminants that will exclude the material's use as fill. Remaining material may also be used for meeting final grades of the berth pocket and the slope since hydraulic dredges are not precise enough.

Rock quarry will be placed to stabilize and prevent scouring on the dredge slope (See 2.6.11, *Rock Revetment*, and **Figure 15a**). If turbidity is a concern a silt curtain may be deployed around the area of work to prevent the spread of turbid water from the dredging area.

Cutter Suction Dredging

A pre-dredge survey will be taken of the Project site to determine how much material needs to be removed across the entire dredge limit. This information will be available to the cutter suction dredge operator as a guide for how much material will be excavated within the Project area. Cutter-suction dredges are positioned by a tugboat and then an anchor spread is laid out. The dredge will be able to move itself around a certain area based on the anchor spread. A separate crew will layout an assortment of flexible, submerged, and floating pipeline 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, then the dredge will move in a sweeping motion to remove material. The dredge pump the material through the pipeline where it is handled by an earthwork crew who manage the material. Periodic surveys will be taken to check 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.

Hopper Dredging

A pre-dredge survey will be taken of the Project site to determine how much material needs to be removed across the entire dredge limit. This information will be available to the hopper dredge operators as a guide for how much material will be excavated in the Project area. Hopper dredges are self-propelled and can locate themselves to and within the site. The hopper dredge will use cutter heads that are located on the sides of the vessel and are lowered to the excavation depth. The hopper dredge will make passes over the areas to be dredged to remove material. The material will be transferred to a hopper located within the vessel itself. Once the hopper is full the dredge will move to the disposal location (HOODS) and open the hopper to dump the material. Periodic surveys will be taken to check dredging progress.

This method of dredging does not produce as much turbidity as a clamshell operation, and the area the hopper dredge works in is also too large to practically surround with a silt curtain. Thus, a silt curtain is not normally used with this type of operation. If turbidity does become an issue, it will be more practical to place a silt curtain around any sensitive area (e.g., eelgrass habitat) that is being affected rather than the entire dredging operation itself.

2.6.8.2 Dredging Equipment

The following describes derrick barges and types of dredges that are expected to be used for the Project.

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 (distance from working surface to the boom tip), and 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.

Clamshell Dredge

A clamshell dredge is similar to a derrick barge. However, the crane will be configured to be better at cyclic work. Clamshell dredges have winches and lines set up to allow for the operation of a mechanical bucket and aren't necessarily well set up to perform other types of operations like a derrick barge. Clamshell dredges may also be configured with a walking spud, which pivots and can be used for small movements without use of a tugboat.

Clamshell dredges will use a bucket to remove material from the sea floor, then transfer it to a scow. The scow will be taken by a tugboat to HOODS where the scow will open, and the material will fall out of the bottom of the scow.

Clamshell dredges are more precise than hydraulic dredges but have lower production rates. Clamshell dredges will likely be required for any side slopes, toes, or in areas where obstructions are expected to be encountered.

Hydraulic Dredge

There are two types of hydraulic dredges that could be used on the project: cutter-suction and hopper, as discussed in Section 2.6.7.1, *Dredging Activities*.

2.6.9 Shoreline Protection

A stone revetment will be constructed to provide protection from erosion. Revetment is the simplest, most cost-effective solution, is currently used at the site, is easy to maintain and adapt to SLR, 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 will also provide a benefit to the bay ecosystem.

The stone revetment will require a four-foot-thick section with a 2.5-foot layer of 14-inch D50 riprap underlain by a 1.5-foot layer of 5-inch cobble, with a 2H:1V slope. The stone revetment is the simplest structure to construct for slope protection. The sloped nature of the revetment requires placing rock below the High Tide Line (HTL) (**Figure 15**).

2.6.10 Marine Berths and Wharf Construction

Berth construction will include construction of the following structures.

- North and South Marginal wharves.
- Near shore berthing dolphins.
- Near shore mooring dolphins.
- Wet storage berthing dolphins.
- Wet storage mooring dolphins.

The structures will be comprised of concrete decks supported by pile supported dolphin structures with fendering. The wharves will be located above a slope in the dredged berth area. The slopes under the wharves will require rock revetment for slope stabilization and to prevent scouring. The near shore dolphins will be located on either end of the wharves and may or may not be located within a slope or dredge berth area. The wet storage dolphins will be located in the wet storage areas which do not require rock revetment.

2.6.11 Rock Revetment

Rock revetment will be placed along dredged slopes to stabilize them (**Figure 15a**) and under the wharves and along shorelines once dredging is complete (**Figure 15b**). Additionally, revetment will

be placed to stabilize the dredge slope. Rock revetment will be brought to site via a material barge loaded at an offsite quarry and tended by a tugboat. The material barge will be moored to a floating crane which will be positioned such that revetment stone can be pushed off the side of the material barge using a loader at the desired location. More precise placement of rock to either fill low points, or when getting close to design thickness, will be placed by the 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 it intends to dump the rock and will tilt the bucket to dump the rock. Periodic survey will be performed to confirm grades are met.

2.6.12 Pile Driving

Pile driving will occur once all rock revetment is in place to avoid any damage to the piles during rock placement. Additionally, access to the slope to place rock and to perform quality control surveys will be hindered if the piles were already in place.

The ten pile rows furthest from the water will be installed by a derrick barge to construct wharfs and the remaining landward piles will be installed by a land-based crane (**Figure 16**). Piles will be installed in a type-writer order in which about five rows will be driven out further than the succeeding five rows, and this will continue until all rows are completed for a given length of the wharf. It is anticipated that all piles will be open ended steel pipe piles. The piles will be installed using a vibratory hammer for initial positioning and driving and then with an impact hammer.

Pile Installation Phasing

- North wharf – Phase 1: Installation of approximately 1,260, 175-foot-long, 36-inch diameter steel pipe piles (600 in water, 660 on land). The berthing and mooring dolphins will require approximately 24, 200-foot-long, 36-inch steel pipe piles and concrete deck and fenders.
- North wharf – Phase 2: Installation of approximately 780, 175-foot-long, 36-inch diameter steel pipe piles (600 in water, 180 on land). The berthing and mooring dolphins will require approximately 24, 200-foot-long, 36-inch steel pipe piles and concrete deck and fenders.
- South wharf – Phase 3: Installation of approximately 1,712, 175-foot-long 36-inch diameter steel pipe piles (1,200 in water and 512 on land). The berthing and mooring dolphins will require approximately 48, 200-foot-long, 36-inch steel pipe piles and concrete deck and fenders.
- Wet storage pier: Installation of approximately 24, 200-foot-long, 36-inch diameter steel pipe piles. The berthing and mooring dolphins will require two, 200-foot-long, 72-inch diameter piles and concrete deck and fenders.
- Wet storage site 1 including sinking basin: Installation of approximately 192, 200-foot-long, 36-inch diameter berthing dolphin piles and approximately 16, 200-foot-long, 72-inch diameter mooring dolphin piles.
- Wet storage site 2: Installation of approximately 168, 200-foot-long, 36-inch berthing dolphin piles and approximately 14, 200-foot-long, 72-inch diameter mooring dolphin piles.
- In total, there will be approximately 2,912 piles installed in the water and 1,352 installed on land.

2.6.13 Wharf Deck Construction

Once piles are driven for 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. The falsework is a supporting structure that attaches to the piles which is designed to hold the weight of forms, rebar, concrete, and other construction 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 but will likely be land 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 and 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, finished, and curing methods implemented in a work shift. The main wharf is 150 feet wide and 3 feet deep, so the length of pours will 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 trucks.

Once the concrete reaches sufficient strength and curing is complete, 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 separate from deeper sections of the wharf (such as where the fenders will attach or breast), where the concrete is above the elevation of the main deck pour (such as any curbs), or any embeds which have critical elevation requirements such as vaults. These areas will be poured separately for ease of construction and will 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 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 on the new wharf deck.

2.6.14 Site Drainage and Utilities

Utilities in the backlands will be installed after the pre-loading operation is completed in a given area and the surcharge has been removed. Installation will include trenching to place buried conduits, pipes, and structures (such as utility vaults), installation of utility pipes, conduit, and vaults, backfilling, and compacting, or slurry will be poured to fill the remaining void. Once the water, sewer, and storm drain utilities are installed, they will be tested for pressure and water quality prior to commissioning.

2.6.15 Habitat Area Construction

Habitat Restoration Subarea construction will create and enhance onsite wetland and ESHA habitats. Areas will be lowered in elevation to introduce tidal influence and develop salt marsh habitat. Freshwater wetlands will be created at the margins of salt marsh to mimic natural salt marsh to freshwater marsh ecotones in Humboldt Bay (**Figure 10**).

Freshwater wetland will be developed by excavating geomorphic low points to intercept groundwater; placing clay soils in the bottom of geomorphic low points to intercept groundwater; and/or placing clay soils in the bottom of geomorphic low points to capture and retain rainwater.

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.

2.6.16 Building Construction

Building construction will follow site preparation and grading. Building construction will include the construction of administrative and storage buildings such as those shown in **Figure 5**; the type, placement, and number of buildings is subject to change.

2.6.17 Site Finalization

At the conclusion of building construction, the areas surrounding the buildings will be finished to grade with DGA and geogrid. The final stage will include construction of permanent site fencing, barriers, access gates, and security check points.

2.6.18 Demobilization

This activity consists of demobilizing the Contractor's workforce and equipment from the worksite and staging areas. This includes all activities for transportation of 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 unless required otherwise. All waste, contaminants, temporary works 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.

2.6.19 Construction Staffing

The construction workforce will fluctuate throughout the project but will be made up of, on average, 90 personnel and up to 165 personnel during the peak for Phases 1 and 2. Phase 3 will have, on average, 45 personnel and up to 115 personnel when the buildings and utilities are being installed.

This number will 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 wharf, utilities, and buildings.

The construction workforce will primarily be resourced 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.

2.7 Operational Project Access

2.7.1 Vehicle Access

There will be four access points into the Project site during operation: two primary access points and two secondary access points (**Figure 12**). The two primary access points for vehicular traffic will be the North and West Access Roads. 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. The two secondary access points will be for limited special and emergency type access. The secondary access points are located across from LP Drive on the west property boundary and along the southeast side of the Project site (shown as driveways on **Figure 12**).

2.7.1.1 North Access Road

The North Access Road will follow a similar alignment to that of the existing access road, although the new access road will be higher in elevation than the existing access road. The new road will tie in to Vance Avenue at an approximate elevation of 16.5 feet, and it will maintain a minimum road surface elevation of 16.1 feet until it ends at the Project site. The North Access Road will be a private road, so it will be constructed with two 12-foot gravel lanes and 4-foot gravel shoulders.

2.7.1.2 West Access Road

The West Access Road will follow an existing (paved) segment of Vance Avenue between LP Drive and the recently constructed Phyllis Rex Townhomes in Samoa, until Vance Avenue turns to the north as it approaches the townhomes. After Vance Avenue turns to the north, the West Access Road will continue running parallel to the Great Redwood Trail Agency (GRTA) corridor until it reaches the Project site. This segment of land between Vance Avenue and the Project site does not contain an existing access road, is vegetated, and the existing ground surface is sloped.

The West Access Road will be designed to meet County standards between LP Drive and the driveway to the Recology™ Samoa Resource Recovery Center site. East of the Recology driveway, the West Access Road will be designed as a private road.

2.7.1.3 Offsite Roadway Improvements

A minimum 40-foot width is planned for all public roadway access points to the Project in order to accommodate standard semi-trucks. The 40-foot road widths will consist of two 12-foot paved travel lanes, and two 8-foot paved shoulders. Depending on the configuration of the road, 2-foot gravel shoulders may also be needed along the sides of the roads. The current width of Cookhouse Road is approximately 30 feet. The current width of Vance Avenue near the project site is approximately 22 feet. The current width of LP Drive is approximately 28 feet. The intersection of Vance Avenue and Cookhouse Road will be expanded to accommodate the turning radius of semitrucks (**Figure 17**). In addition, all-way stop controls are warranted as the adjacent Town of Samoa develops. This modification would require an additional stop sign on Cookhouse Road eastbound, and on Vance Avenue northbound..

2.7.2 Bicycle Access

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 mile in length) adjacent to the West Access Road (**Figure 18**).

2.8 Operational Site Drainage and Utilities

2.8.1 Existing Utilities

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

2.8.2 Proposed Utilities

The utilities that are proposed to serve the Project site are domestic potable water, untreated industrial water, fire protection water, storm drain, sanitary sewer, electrical, roof mounted solar, and telecommunications. All the new utilities, existing site utilities that must be re-routed, and the planned utilities for adjacent projects are included in the offsite utility corridor and shown in **Figure 19**.

Buildings onsite will require domestic water, industrial/fire water, sanitary sewer, telecommunication, and power. The wharves will require domestic water, industrial/fire water, and power. The onsite utility corridor has reserved space for a joint trench that is anticipated to include telecommunications and electrical. The onsite utilities are proposed to be routed along the perimeter of the Project site to minimize impact on the utilities from the industry vehicle and equipment traffic. It is expected that there will be two sanitary sewer lift stations that will be connected to the buildings on site and routed to the Samoa Waste Water Treatment Facility (WWTF). The site's fire water system and source are not defined because the fire water demand is unknown. A water storage tank and emergency fire pump may be needed to obtain the required fire flow for the Project, so space is reserved for these features as shown in **Figure 20**.

2.8.2.1 Industrial Water Supply

The industrial water system of the HBMWD was designed and constructed to provide approximately 60 million gallons per day of raw water to the peninsula to serve the former pump mills. This system does not have any treatment, so turbidity in the water source (the Mad River) is reflected in the industrial water. It may be necessary to modify the existing system to reduce the turbidity of the water supply. The system was sized for a larger capacity than what will likely be required to support the Project and the surrounding developments on the peninsula. Once the Project's industrial, domestic, and fire water demands are confirmed, coordination with the HBMWD will be necessary to determine if modifications to the system will be needed.

2.8.2.2 Domestic Water Supply

HBMWD will supply domestic water from the Mad River for the Project. The domestic water point of connection is at LP Drive on the western boundary of the Project site and connects to the existing 15 inch HBMWD domestic water main. Domestic water is anticipated to provide water for restrooms, sinks, kitchens, drinking fountains, and other similar uses at all site buildings and each wharf.

2.8.2.3 Wastewater Treatment

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 WWTF to an intertie with the ocean outfall pipe at Redwood Marine Terminal II. The force main that conveys the treated effluent from WWTF to the ocean outfall is approximately 0.75 mile long, 4-inches in diameter, and follows the proposed alignment for Vance Avenue included in the Samoa Improvement Plans from the Samoa Pacific Group (**Figure 19**).

2.8.2.4 Storm Drainage

All existing storm drain systems identified within the Project site will be removed or abandoned in place with slurry fill based on geotechnical recommendations. The new site drainage proposes to take advantage of the proposed east-west crowned grading to allow surface flow collection around the perimeter of the site (**Figure 14b**). Bio-filtration planters with 10-year and 100-year overflow risers will be installed not only for stormwater collection, but also for Low Impact Development (LID) treatment. Backlands adjacent to the wharfs will collect stormwater in trench drains along the wharf, which will connect to trash capture devices, LID mechanical treatment, and then outfall to the Bay (**Figure 14b**). Reconstructed storm drain systems from Samoa will pass through the site to maintain existing drainage patterns.

Bio-Filtration Planters

Bio-filtration planters are proposed to collect and pre-treat site runoff (**Figure 14b**) prior to sending the flow to StormPods (infiltration vaults) (**Figures 21, 22**), which will allow the runoff to infiltrate into the ground, and any excess to discharge to the bay.

Bio-filtration planters consist of four distinct components.

- Surface Ponding Zone —Provides temporary surface storage of precipitation and runoff which 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 via filtration, volatilization, biological uptake, media adsorption, and vegetative transpiration.
- Gravel Storage Layer—Allows for 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. Liners or other barriers are not typically allowed in order to promote infiltration into the native soils.

As the Project will consist of complete redevelopment of the site and because the site will consist primarily of impervious surfaces, preliminary sizing of the bioretention vaults is 4% of the entire drainage management area.

BioPod and DVS Trash Capture

BioPods (bio-filtration vaults) and dual vortex separator devices will be installed to remove trash and treat stormwater before discharging to the bay (**Figure 14b**). Trench drains will collect stormwater and discharge to trash capture devices and then a BioPod.

Offsite Drainage

Due to the proposed grading of the backland, offsite runoff is anticipated to collect and pool along low points of the Project site boundary where it previously flowed across the site, either ponding or discharging to the bay. To relieve drainage collection at certain points along the raised Project boundary, the Project will install 10-year and 100-year overflow pipes throughout the site (**Figure 14**).

2.8.3 Electrical Infrastructure

2.8.3.1 Existing Utility Infrastructure

The Project site is currently fed from Pacific Gas and Electric's (PG&E) 1103 circuit, a 12kV distribution line on wood poles, which currently transverses the Project site from the Fairhaven substation 12kV switchyard enroute to feeding Samoa. At this time, the load hosting capacity of the Fairhaven 1103 circuit is 7.27MW, which may be adequate to feed Phase 1 of the Project; however, with the planned buildout of this Project, as well as buildout of Samoa and with the development of the Nordic Aquafarms project, an alternate design is being proposed. A PG&E Service Application will be necessary to confirm load serving and photovoltaic (PV) generation capacity.

2.8.3.2 Proposed Electrical Infrastructure

The project will include overhead and underground utility relocations, construction of transmission lines, and installation of electrical substations and microgrids. The maximum combined Phase 1 and 2 load is estimated at 28.265 megavolt amperes (MVA). The proposed electrical infrastructure will serve the site with redundant 60 kilovolt (kV) lines from the Fairhaven substation.

While the Phase 1 load is estimated to be between 6.821 and 8.185MVA, the combined electrical load for Phase 1 and 2 of the project development is estimated to be between 22.267 and 28.265MVA. Individual phase loads could be independently fed by a single 12kV line, but this will require an upgrade of the Fairhaven Substation transformer bank and 12kV yard and will not provide redundancy in the power supply to the site. Therefore, for planning purposes, redundant 60kV lines from the Fairhaven Substation will ultimately feed the site, each independently capable of supplying power to the full site once built out. However, the proposed infrastructure could easily support a 12kV service for Phase 1 and an upgrade to 70kV for Phase 2 if needed.

An overhead double-circuit 60kV transmission line on about 60-foot-tall steel poles will be constructed from an upgraded 60kV switchyard at the Fairhaven substation to the Project site. A 15-foot expansion of the existing Fairhaven-Evergreen Pulp-Fairhaven Power Plant 60kV PG&E easement will be required to accommodate this new transmission pole line. Once at the project 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 back-up islanded project operations when the utility is unavailable.

Two new approximately 100-foot x 60-foot substations will be constructed at the terminus of the new transmission lines for transformation from 60kV to 34.5kV for distribution throughout the Project site. One substation will be constructed during Phase 1 (Substation North) and the other substation during Phase 2 (Substation South) (**Figure 23**).

Power distribution throughout the site will be through a 34.5kV underground ring with 38kV outdoor switchgear located at each substation. This switchgear will be equipped with a main circuit breaker and two feeder circuit breakers, one to feed the loads associated with each phase and a normally open tie breaker to feed the other substation in the case that one of the two redundant 60kV electrical services is down. Each building will be fed at 34.5kV via outdoor 38kV switchgear. Power will be stepped down to 480V for interconnection of a roof-mount photovoltaic system, a grid-interactive battery energy storage system, a back-up generator, and building 480V loads. All pad-mount transformers associated with the Project will utilize natural ester insulating fluid for reduced flammability and biodegradability.

For Phase 2 of the project, PG&E circuit 1103, which currently traverses the Phase 2 Project site, will be rerouted around the Project site overhead or underground to 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 60kV substation and 12kV switchyard is expected to be upgraded and sized to provide an additional 5MW of capacity dedicated to the Project site. Given the additional 5MW of capacity, it is proposed that the Phase 1 2.5-MW landfill PV system connect to the Pulp Mill substation via a new overhead or underground interconnection 12kV distribution line. Interconnection at this location will require a new 12 kV switchyard that is anticipated to comprise a 15 kV switchgear line-up,

including PG&E metering, a main circuit breaker, and a feeder circuit breaker collecting power from step-up transformers located throughout the array.

Phase I Building Substation and Microgrid

A Phase 1 microgrid electrical substation is proposed to be sited adjacent to the Storage and Assembly Building and provide power to the facility, as well as serve critical loads in the north end of the terminal (**Figure 5**). A 480V microgrid is proposed for the Storage and Assembly Building in Phase 1 of the Project.

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-kilowatt direct current (kWDC). The system will utilize rows of 420W high efficiency, monocrystalline modules 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 IBC access pathways and smoke ventilation setbacks.

Power generated by the arrays will utilize AC conversion through three 100kW, 480V inverters adjacent to the building for 480V three phase interconnection into a building's 480V switchgear. These inverters are UL 1741-SA listed and can be frequency controlled by the battery energy storage system to ramp PV output to balance generation with the load. The direct current (DC)/alternating current (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 480V 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 Project includes a 1.9-MW battery energy storage system with a 3-hour duration of energy storage. The duration is based on a battery load estimate of 1.3MVA for the Phase 1 critical loads. Load shedding of noncritical loads during grid outages can be implemented to extend the hours of resiliency.

38 kV Switchgear

The substation includes a new 34.5 kV, raintight 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 integrated 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 Supplies (UPS) equipment required for operation and for PV, Battery Energy Storage System (BESS), and load control and monitoring to ensure safe stable grid-connected and microgrid operation. The switchgear feeds a loop-feed, pad-mount 34.5kV step-down transformer and secondary 480V switchgear for interconnection of the battery, generator, and to feed the building and wharf loads.

Emergency Generator

There will be a 2-MW generator for emergency back-up operations to serve the Phase 1 critical load of 1.3MVA. The expected runtime of the emergency generator is based on the reliability of the grid serving the Project site. 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, the number of 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. These planned utility grid outages could require up to 500 hours of operation during these construction activities.

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 (**Figure 5**).

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 the Phase 1 design.

Battery Energy Storage System

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

38 kV Switchgear

In general, the 38 kV switchgear will be similar to Phase 1 equipment but will be 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 back-up operations to serve the Phase 2 critical load of 2.3MVA for the Phase 2 critical loads. The expected runtime of the emergency generator is based on the reliability of the grid serving the Project site. 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 PSPS events, the number of long-term transmission-level outages due to these 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. These planned utility grid outages could require up to 500 hours of operation during these construction activities.

Offsite Landfill Solar Panel Installation

For additional solar generation, the nearby Harbor District-owned solid waste landfill has been identified as a site for local offsite generation from a large, ground-mounted solar PV system (**Figure 9**). Solar energy generated from the system will be used to offset energy use at the terminal.

The total landfill area is 36 acres with four capped waste management units (WMUs) comprising 15 acres. The WMUs are 20 to 25-foot-high, capped mounds containing approximately 98% wood ash from a former pulp mill. The landfill cap consists of a two-foot-thick ash foundation layer, overlain by a 1-foot minimum thickness barrier layer, overlain by a 2-foot minimum thickness vegetation layer and 6 inches of mulch. The final cap surface is sloped no steeper than 3:1 nor flatter than 3%.

A 2.5MWDC, ballasted PV system will be installed on the east-west facing planes of the waste management units utilizing generic PV modules and string inverters. The PV system will connect to the upgraded Harbor District substation via an underground 12kV line during Phase 1 of the Project. Interconnection at this location will require a new 12kV switchgear line-up comprised of 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 back-up battery system to ensure safe and reliable interconnection.

Phase 2 Terminal-Wide Microgrid Option

For Phase 2 of Project buildout, 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 Project site's loads during grid outages.

2.9 Humboldt Bay Area Plan Amendments

The proposed project will require amendments to the Humboldt Bay Area Plan (HBAP). The following amendment to the HBAP are proposed.

- Recognizing 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 designated NR-W by Humboldt County is within the Harbor District's primary regulatory jurisdiction and is 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 4**).
- Differentiate between buildings and nonbuilding structures (e.g., cranes, high mast lighting and assembly of wind turbines) and increase maximum building and structure height 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.

2.10 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 5 presents a summary of related environmental laws, approvals, permits, and/or consultations potentially required for project implementation.

Table 5. Permit Requirements Potentially Applicable to the Project

Agency with Jurisdiction	Regulation(s)	Required Authorization
North Coast Regional Water Quality Control Board (RWQCB)	Federal Clean Water Act, Sections 401	401 Water Quality Certification
U.S. Army Corps of Engineers (USACE)	Federal Clean Water Act, Section 404, 33 U.S.C 408, and RHA Section 10 Individual Permit	Permits for dredge and fill activities in waters of the United States; Federal action requires NEPA compliance.
State Historic Preservation Office (SHPO)	National Historic Preservation Act (NHPA), Section 106	Section 106 Consultation. Submission of Historic Properties/Cultural Resources Report, effects determination, and evidence of tribal coordination by federal lead to SHPO.
U.S. Fish and Wildlife Service (USFWS)	Federal Endangered Species Act (ESA) Section 7 Formal Consultation	Potential need for take authorization under ESA Section 7 will be determined through USACE consultation with USFWS.
National Marine Fisheries Service (NMFS)	ESA Section 7 Formal Consultation	Potential need for take authorization under ESA Section 7 will be determined through USACE consultation with NMFS.
NMFS	Magnuson–Stevens Fishery Conservation and Management Act Essential Fish Habitat (EFH) Consultation	Potential need for EFH consultation will be determined through consultation with NMFS
NMFS	Incidental Harassment Authorization (IHA)	Potential need for IHA will be determined through consultation with NMFS
California Department of Fish and Wildlife (CDFW)	California Endangered Species Act (CESA) Incidental Take Permit with CDFW as CEQA responsible agency Section 2081 ITP California Endangered Species Act (CESA) Incidental Take Permit with CDFW as CEQA lead agency Section 2081 ITP	Potential need for incidental take authorization under Section 2081 of the California Fish and Game Code will be determined through consultation with CDFW; Federal ESA Biological Opinion (BO) and request for consistency determination.

Agency with Jurisdiction	Regulation(s)	Required Authorization
	Consistency Determination California Fish and Game Code Section 2080.1	
California Coastal Commission (CCC) and County of Humboldt	Consolidated Coastal Development Permit Coastal Zone Management Act Consistency Determination (CZMA Consistency)	Consolidated Coastal Development Permit from CCC and County Coastal Zone Management Act Consistency Determination
Harbor District	Development Permit	Development Permit
City of Eureka		Conditional Use Permit
City of Arcata		Conditional Use Permit

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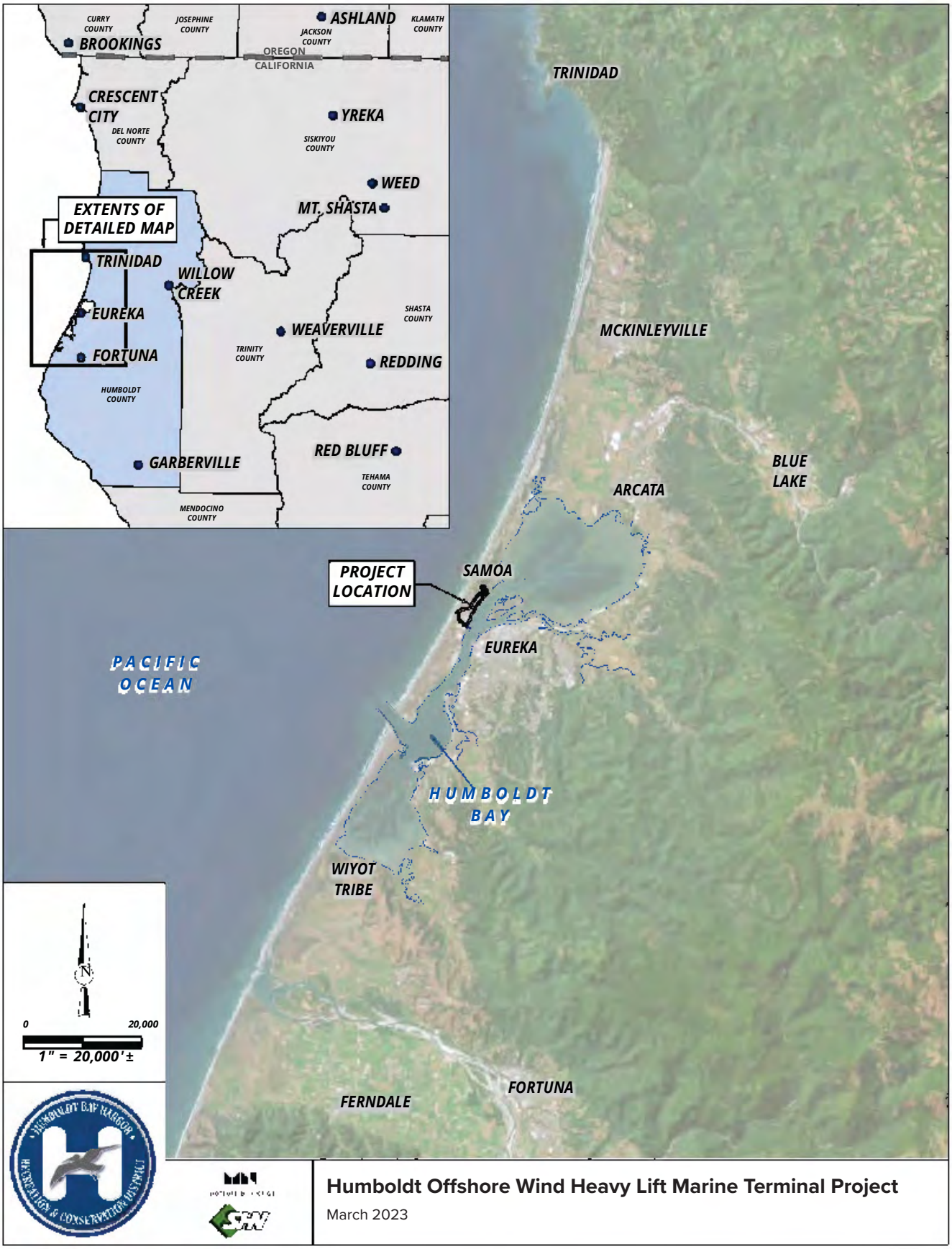
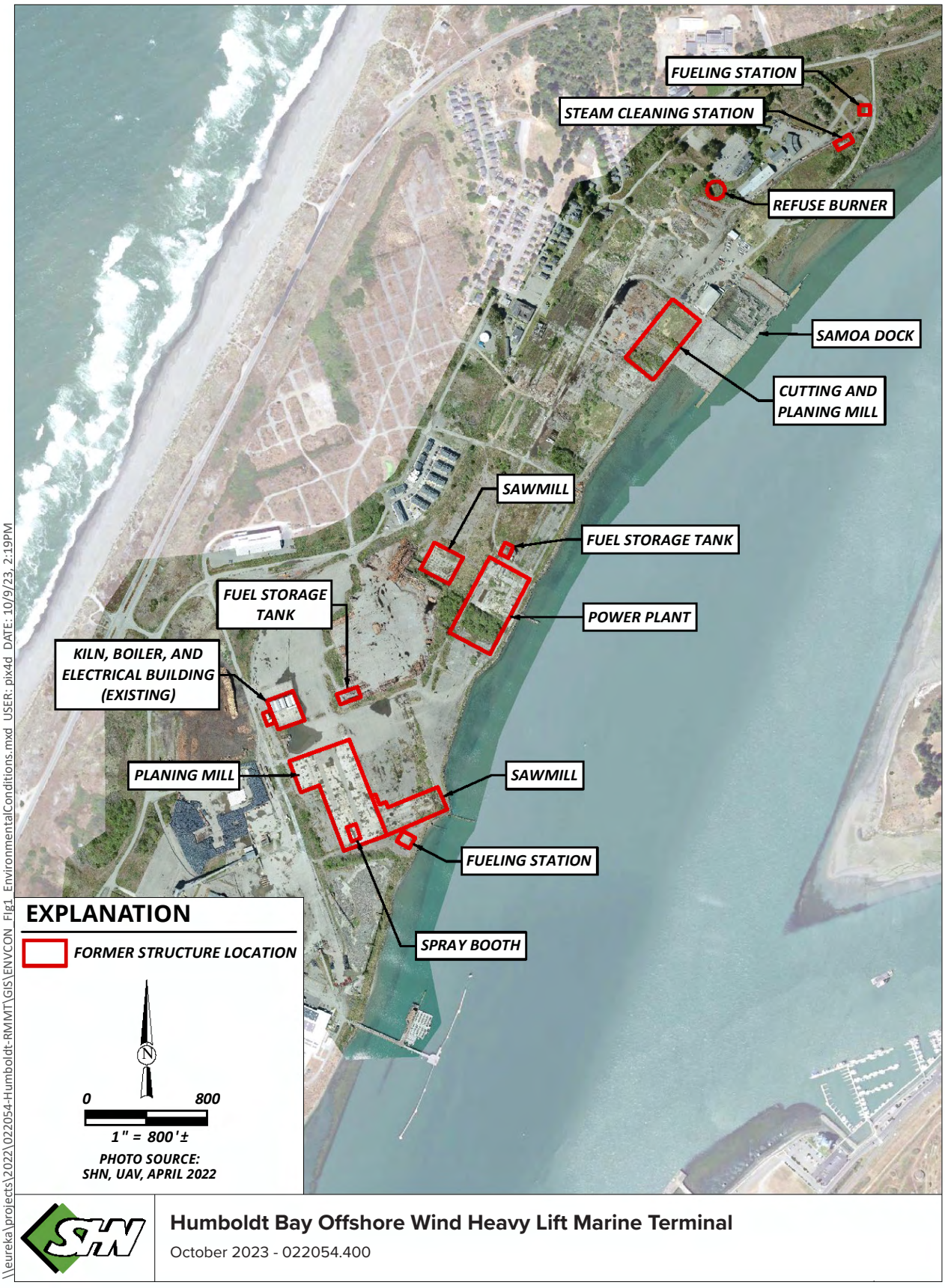


Humboldt Offshore Wind Heavy Lift Marine Terminal Project

March 2023

Graphics ... Humboldt Bay Harbor RMMT 104500 (4/25/2024)

Figure 1
Vicinity Map



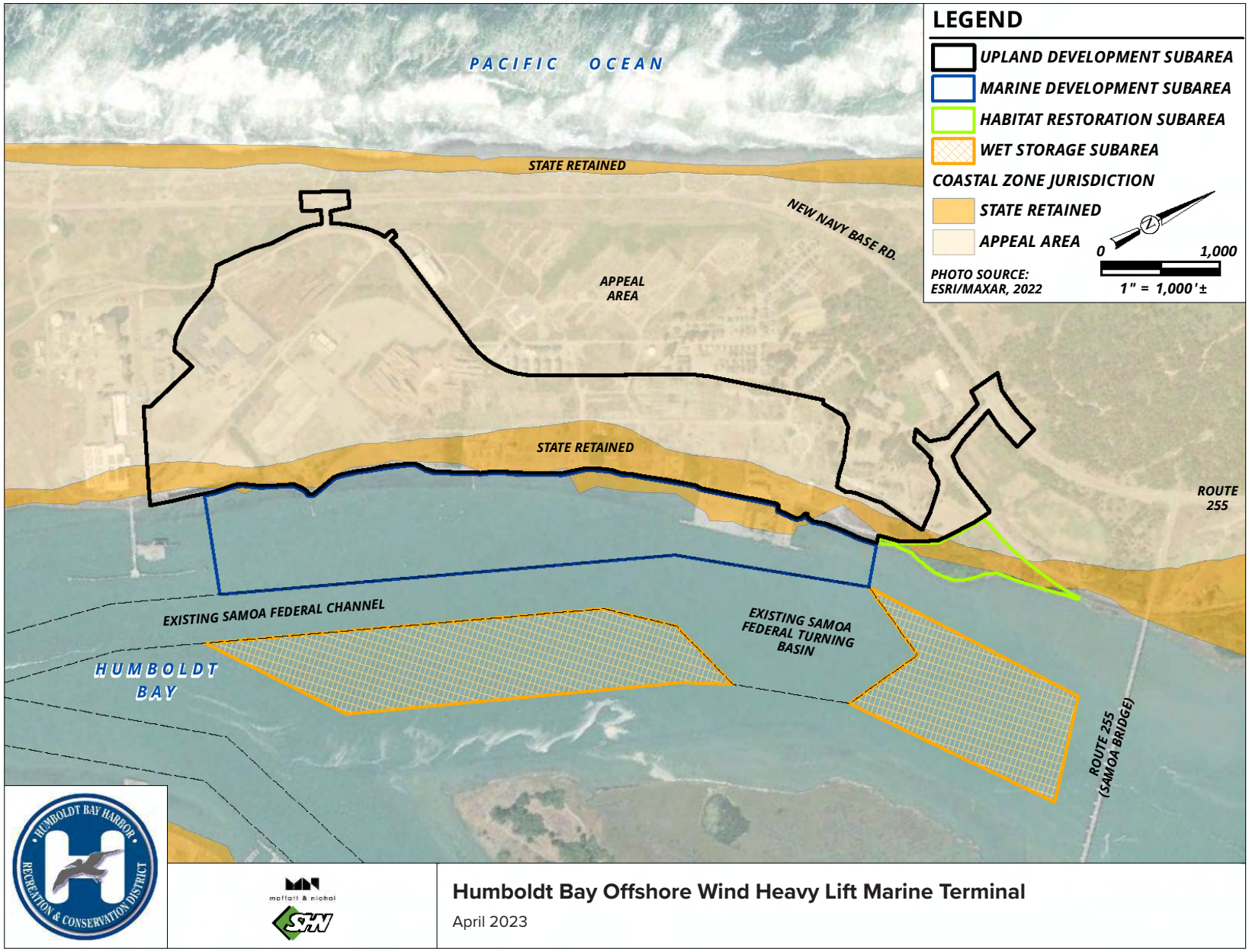
\\eureka\projects\2022\022054-Humboldt-RMMT\GIS\ENVCON_Fig1_EnvironmentalConditions.mxd USER: pix4d DATE: 10/9/23, 2:19PM

Graphics ... Humboldt Bay Harbor RMMT 104500 (4/25/2024)

Humboldt Bay Offshore Wind Heavy Lift Marine Terminal

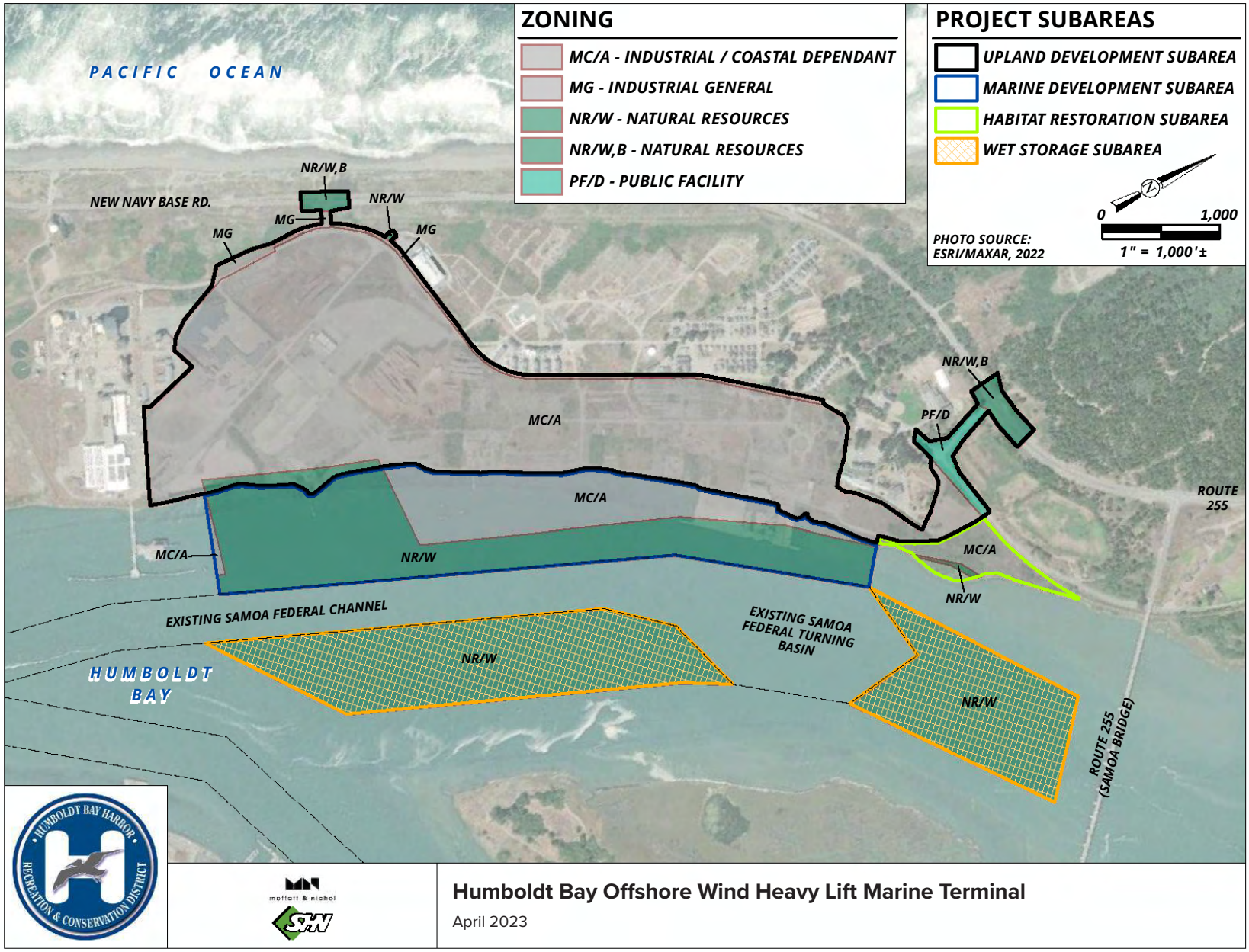
October 2023 - 022054.400

Figure 2
Environmental Conditions



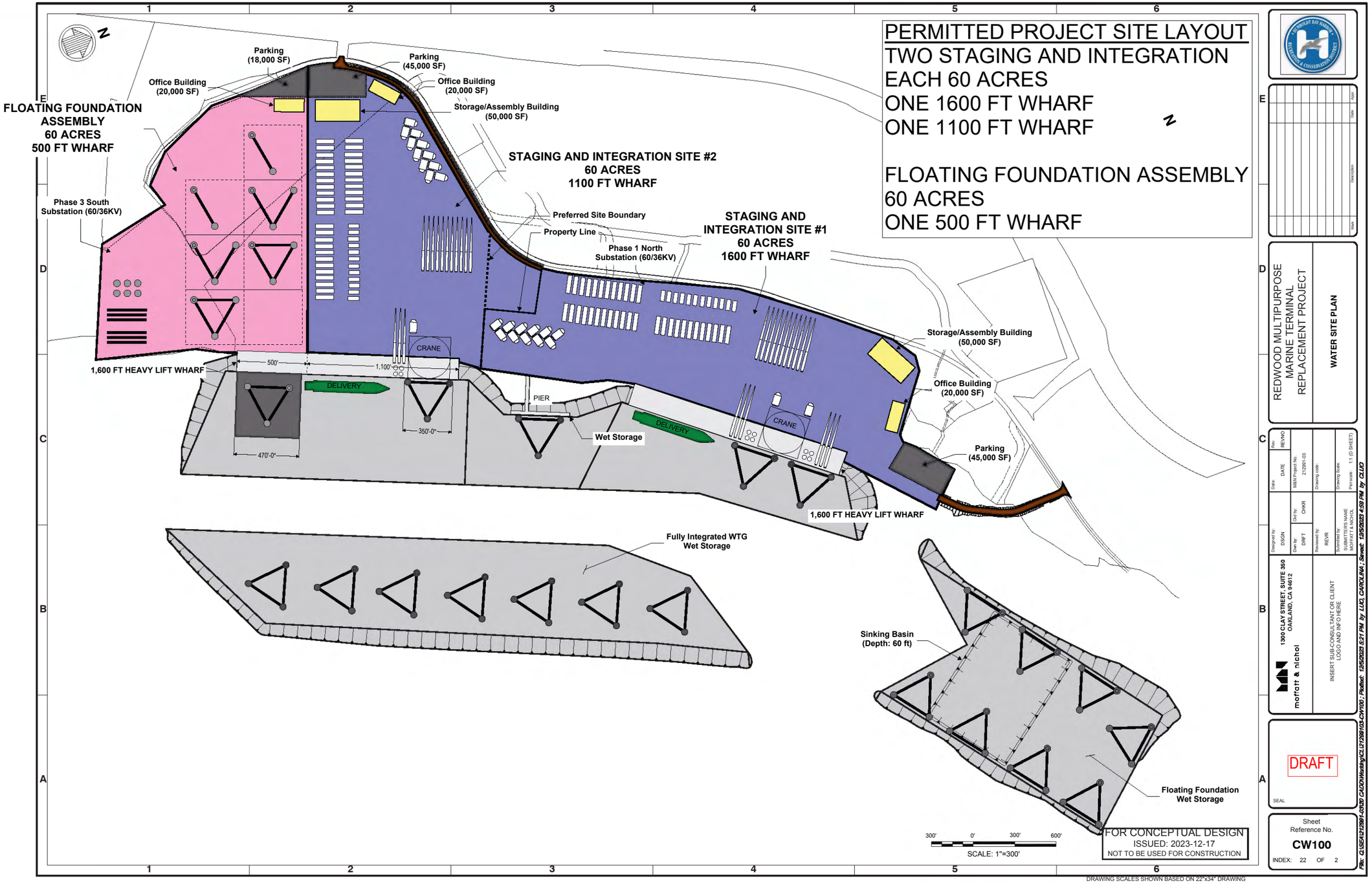
Graphics ... Humboldt Bay Harbor RMMT 104500 (4/25/2024)

Figure 3
Project Subareas and Coastal Zone Jurisdictions



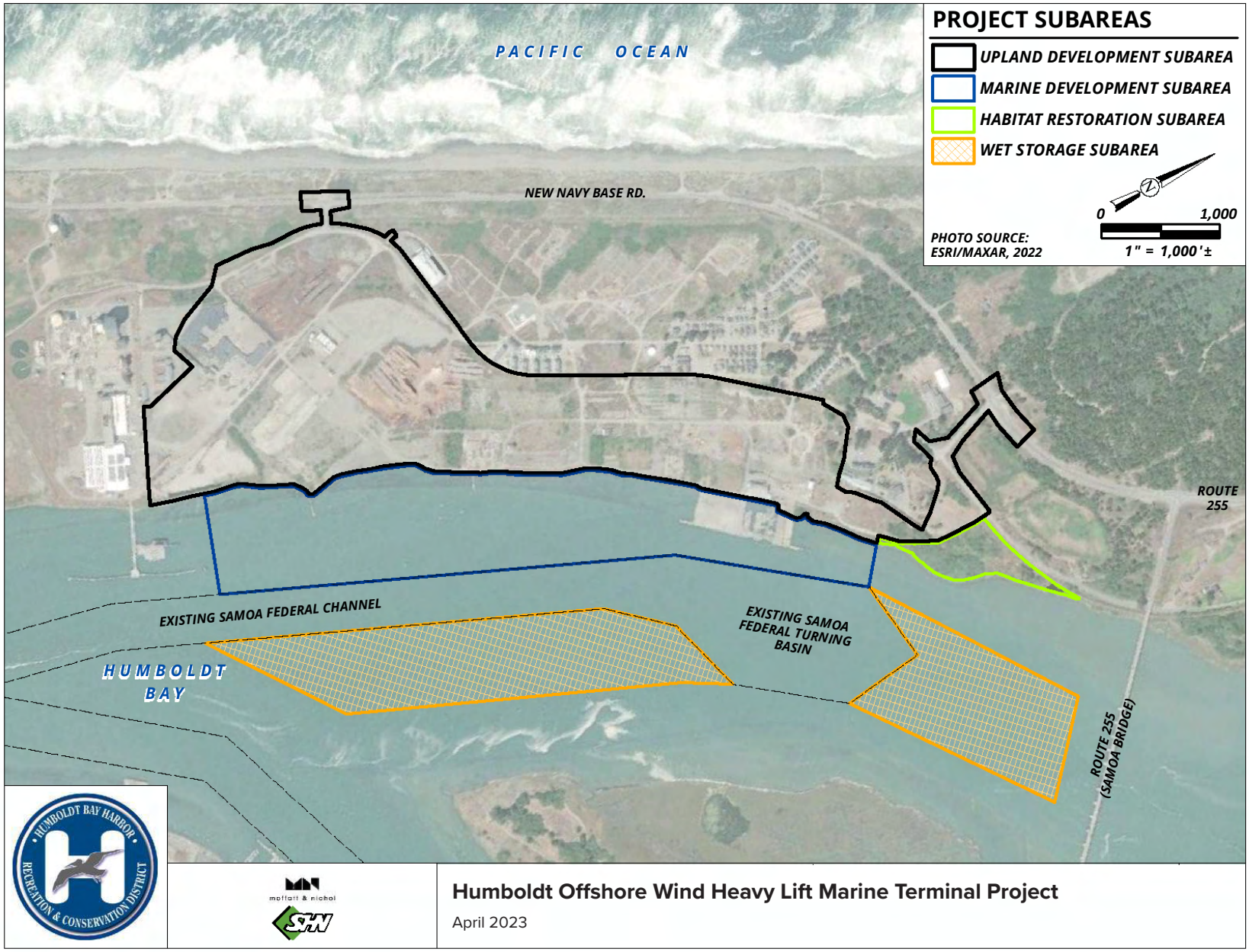
Graphics ... Humboldt Bay Harbor RMMT 104500 (4/25/2024)

Figure 4
Project Subareas and Zoning



Graphics ... Humboldt Bay Harbor RMMT 104500 (4/25/2024)

Figure 5
Site Plan

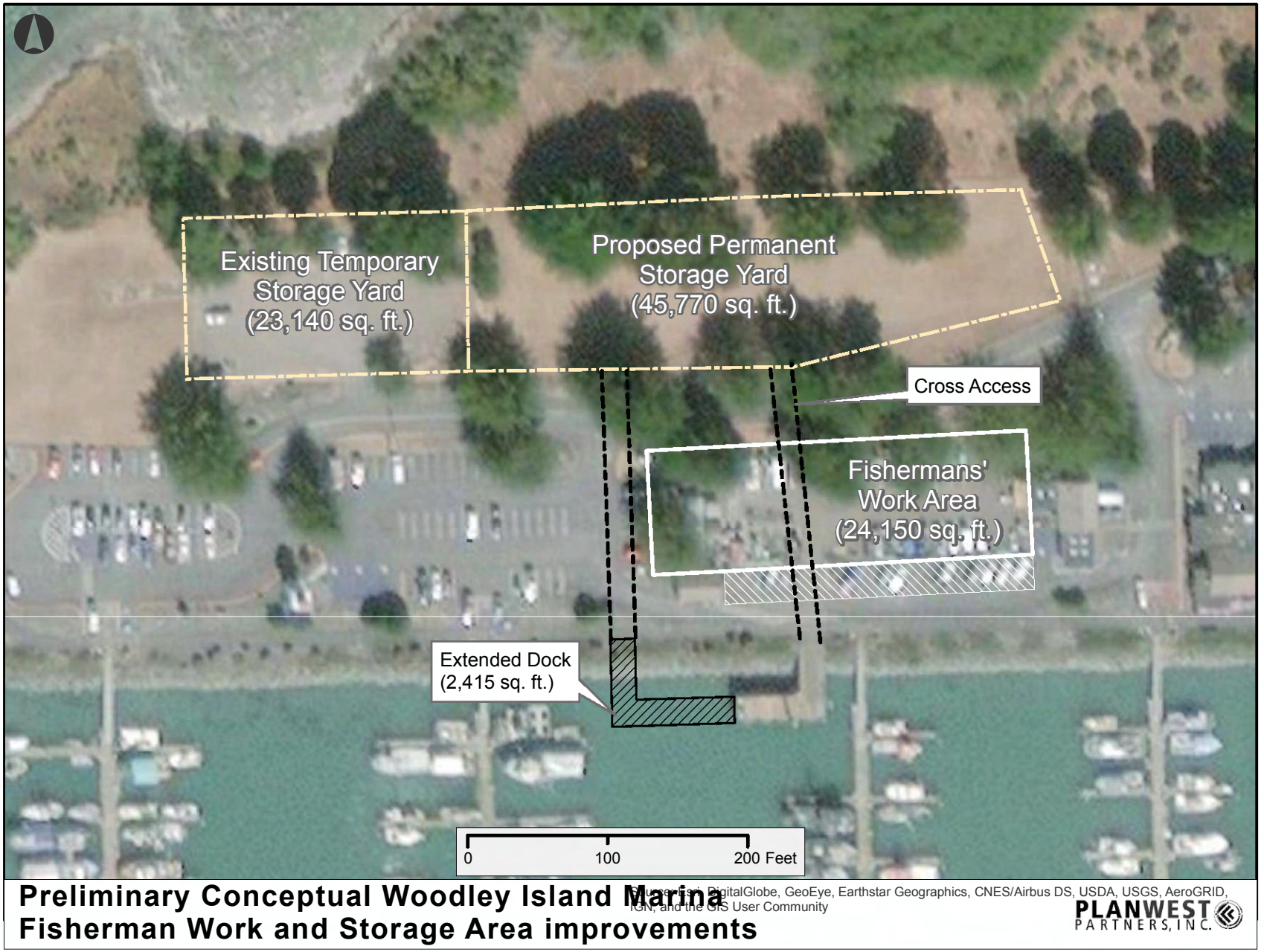


Graphics ... Humboldt Bay Harbor RMMT 104500 (4/25/2024)

Figure 6
Project Subareas

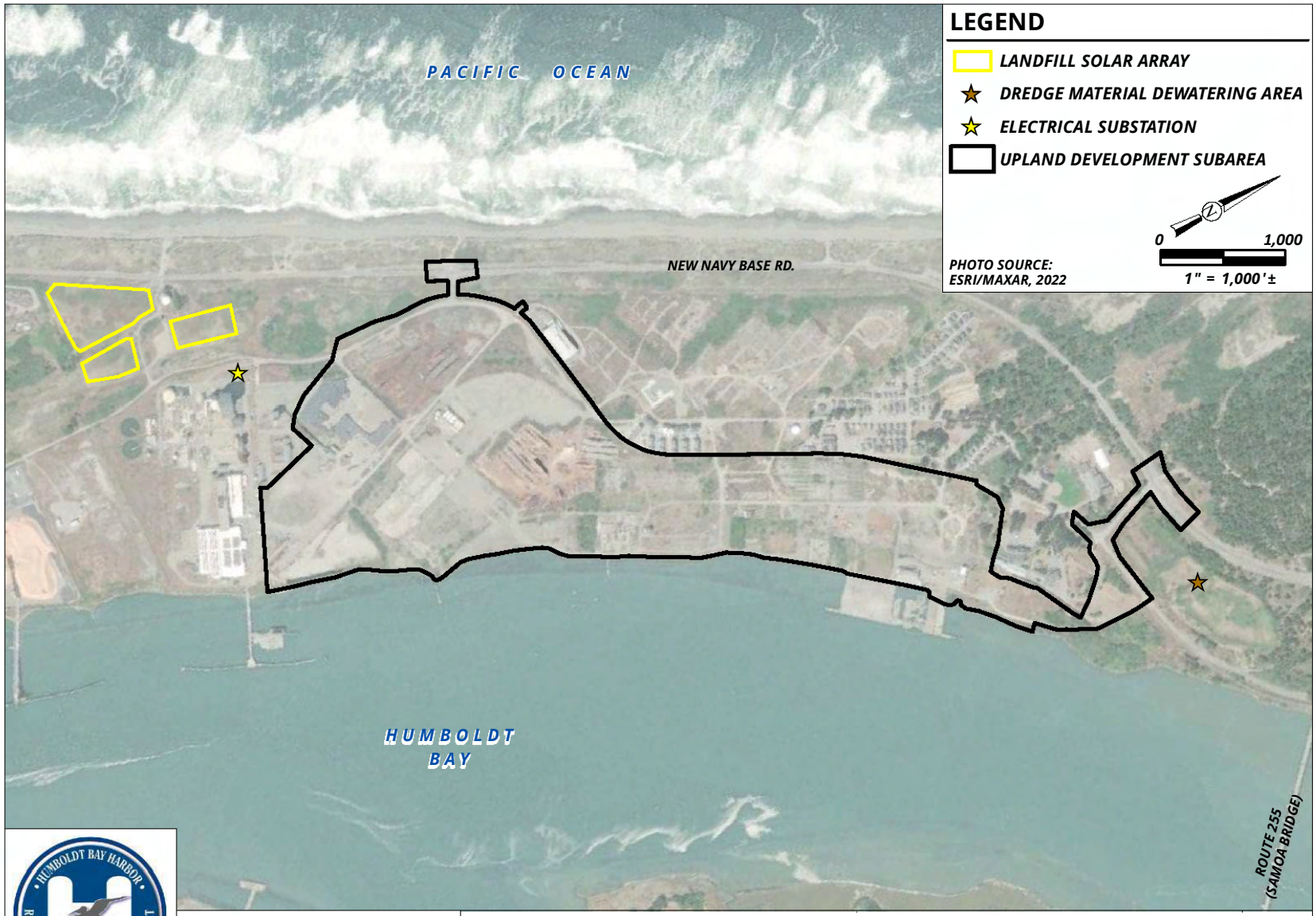
Graphics ... Humboldt Bay Harbor RMMT 104500 (4/25/2024)

Figure 7
Existing Tenant Locations and Proposed Tenant Relocation Sites



Graphics ... Humboldt Bay Harbor RMMT 104500 (4/25/2024)

Figure 8
Preliminary Conceptual Woodley Island Marina
Fisherman Work and Storage Area Improvements



Graphics ... Humboldt Bay Harbor RMMT 104500 (4/25/2024)

Figure 9
Potential Landfill Solar Array, Potential Dredge Material Dewatering Area, and Existing Electrical Substation

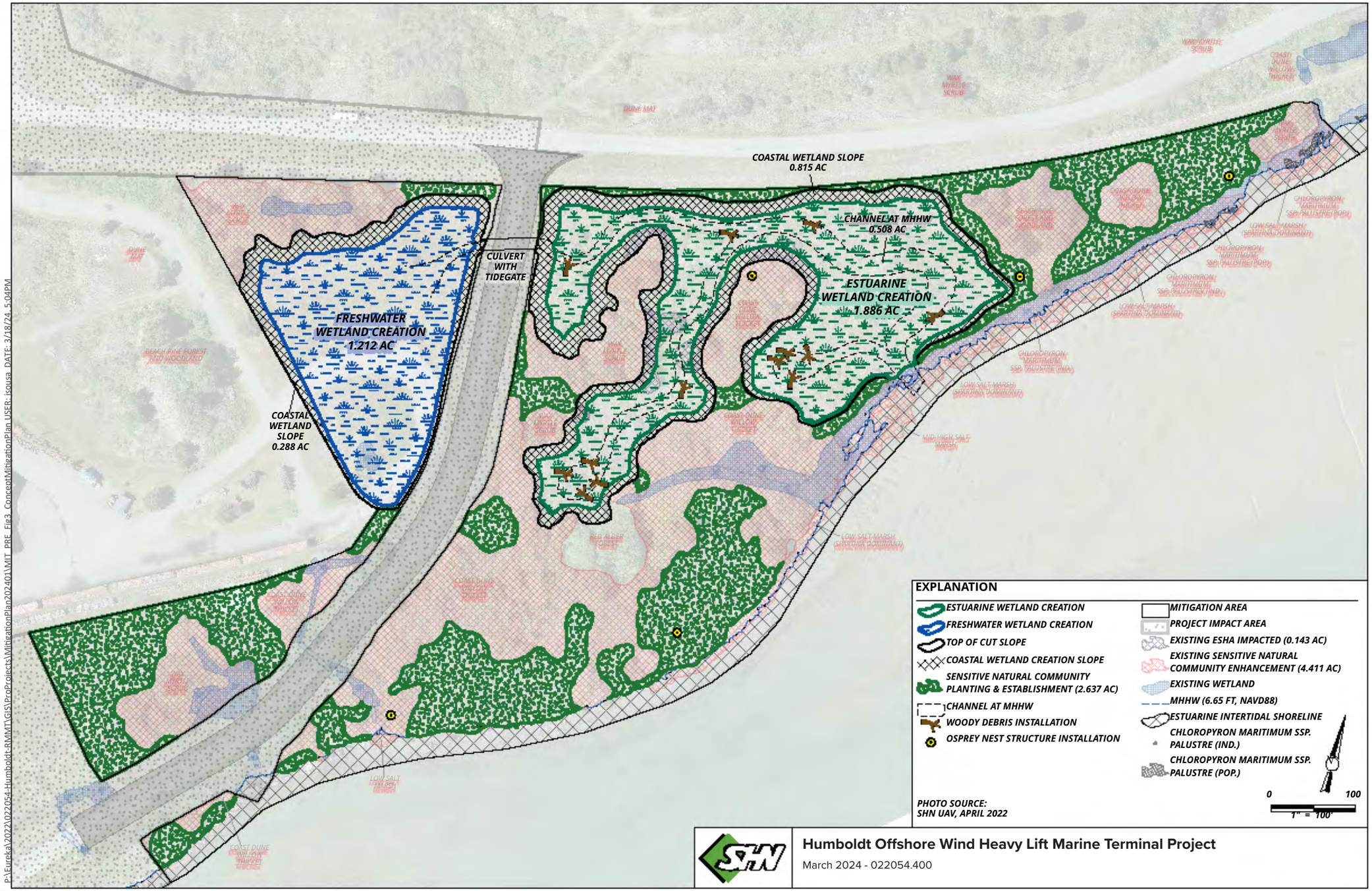
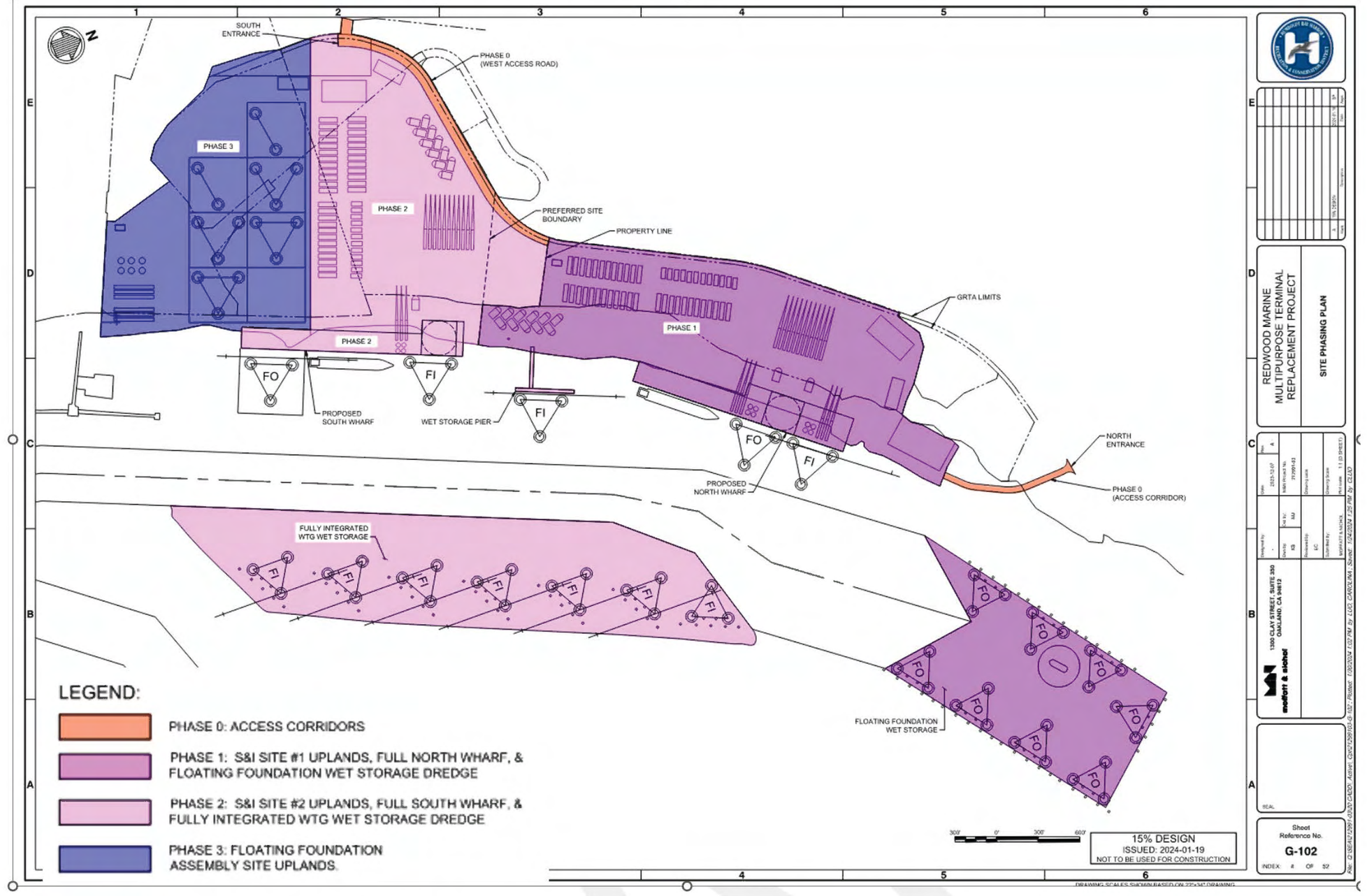
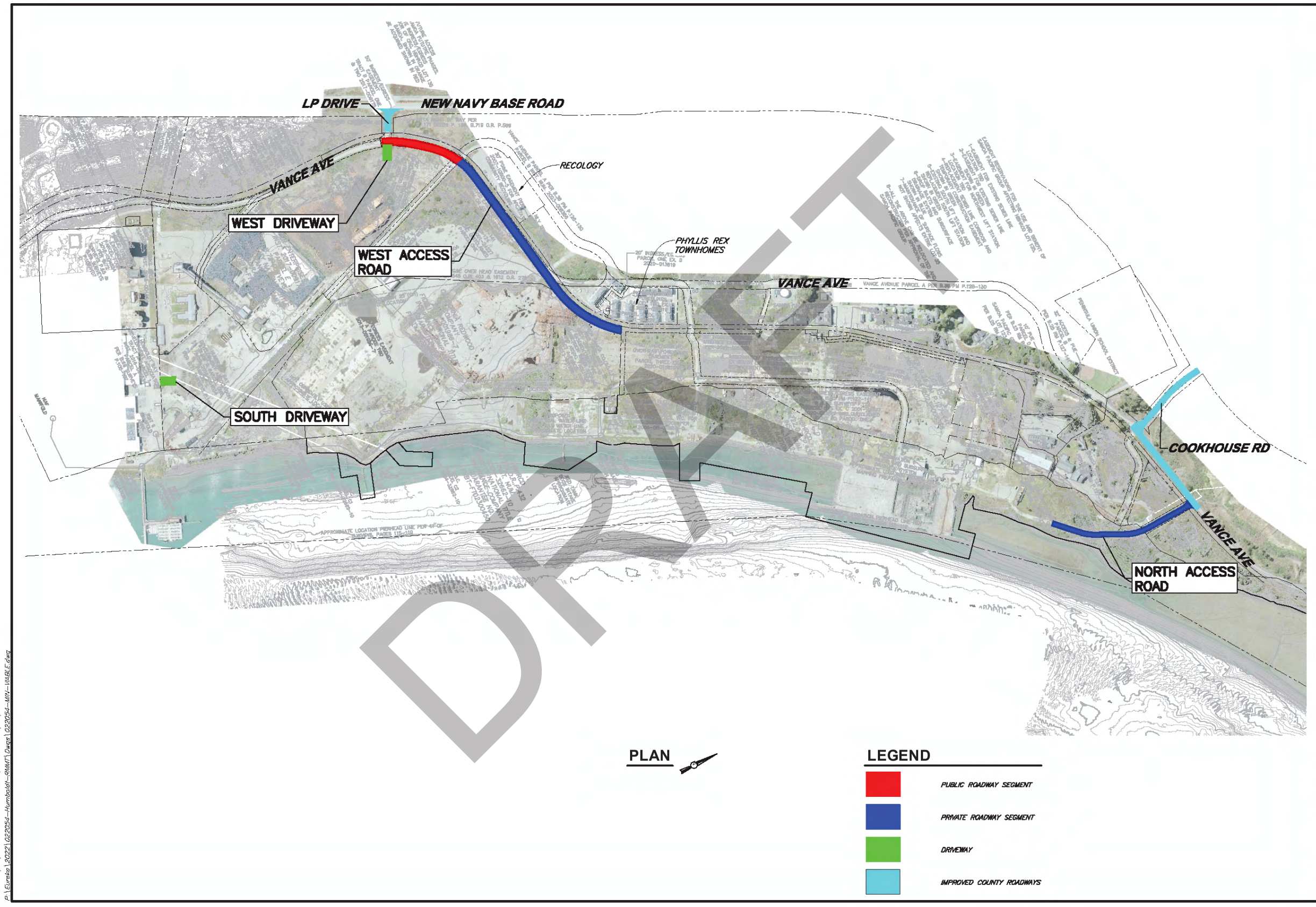


Figure 10
Conceptual Mitigation Plan



Source: Moffatt & Nichol, 15% Design Plans, Sheet No. G-102

Figure 11
Site Phasing Plan



VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

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EUREKA, CA 95501
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NO.	DATE	REVISION	BY

DSGN CC
DR CDN/JWF
CHK JSO
APVD

REDWOOD MARINE MULTIPURPOSE TERMINAL REPLACEMENT PROJECT
SAMOA, CALIFORNIA

ACCESS ROAD OVERVIEW

SHEET
SEQ
DATE 02/2024
PROJ. NO. 022054

SAVED: 2/15/2024 3:52 PM JFOSTER, PLOTTED: 2/15/2024 4:03 PM JOHN FOSTER
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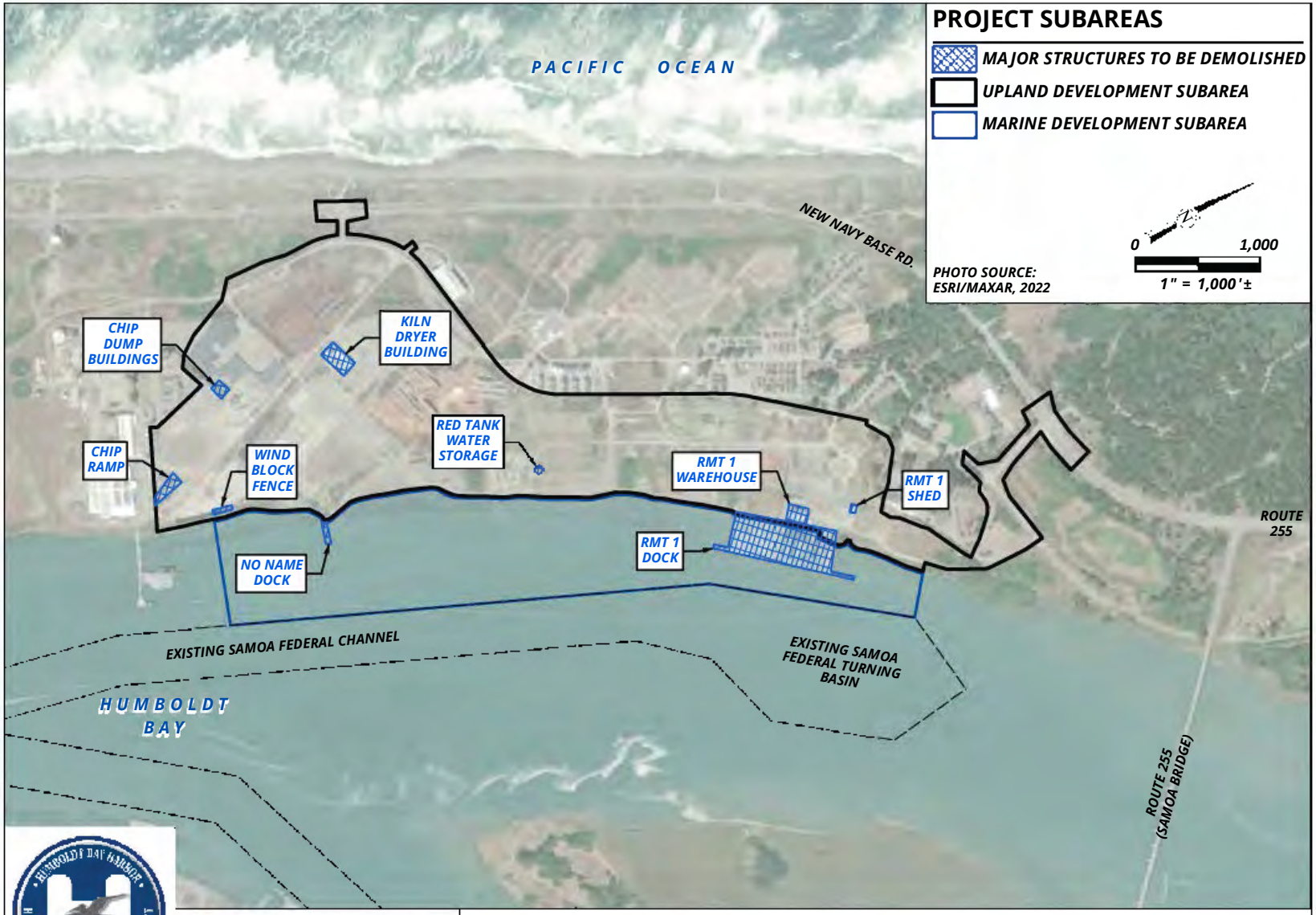
Graphics ... Humboldt Bay Harbor RMMT 104500 (4/25/2024)

Figure 12
Access Road Overview

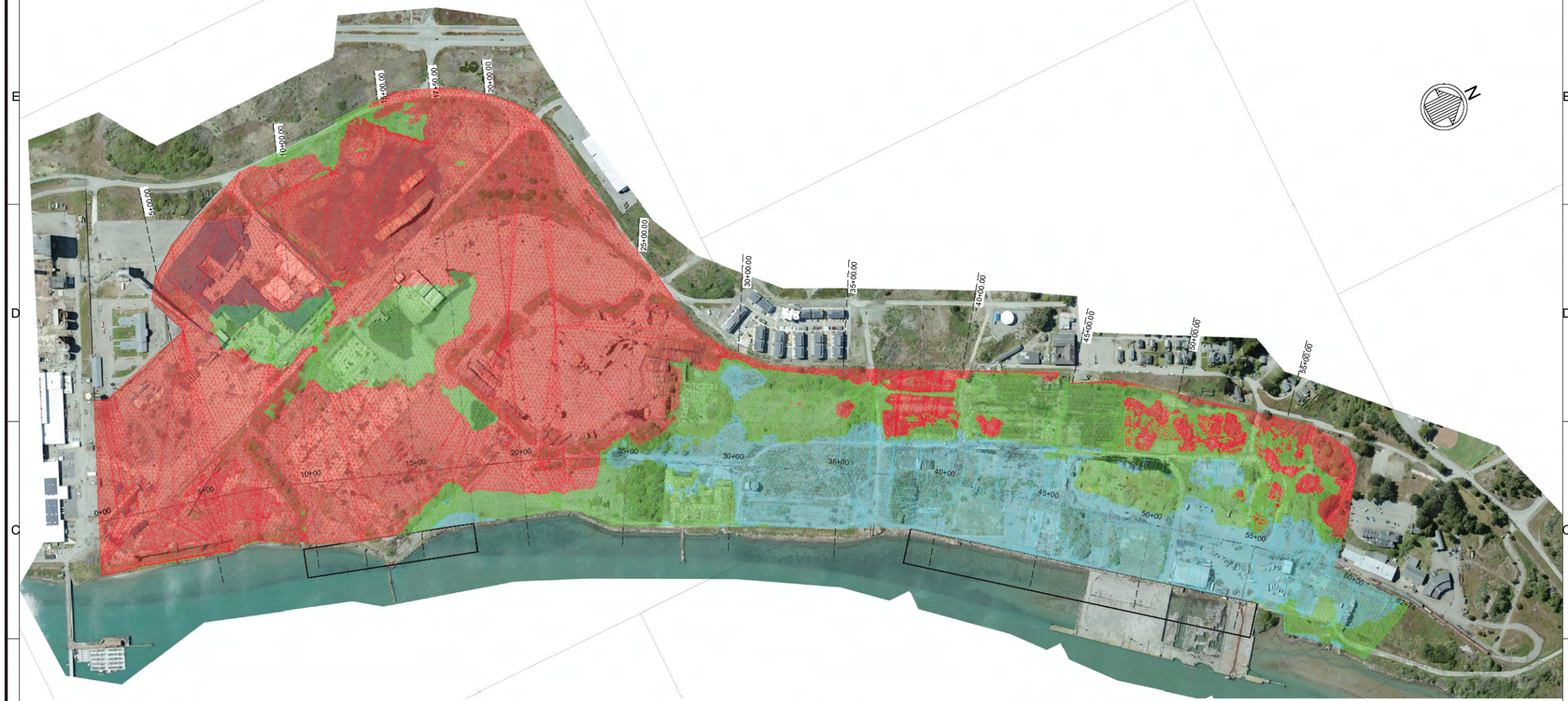


Humboldt Offshore Wind Heavy Lift Marine Terminal Project

May 2023

Graphics ... Humboldt Bay Harbor RMMT 104500 (4/25/2024)

Figure 13
Major Structures to Be Demolished



ELEVATIONS TABLE				
NUMBER	MIN. ELEVATION	MAX. ELEVATION	AREA	COLOR
1	-25.17	0.00	4238830.82	CUT
2	0.00	3.00	1719878.11	FILL
3	3.00	7.24	1419187.41	FILL

Cut/Fill Summary -3 ft

Name	Cut Factor	Fill Factor	2d Area	Cut	Fill	Net
VOL_PLATFORM- 3 ft	1.000	1.000	7381777.06 Sq. Ft.	582166.19 Cu. Yd.	299131.45 Cu. Yd.	283034.75 Cu. Yd.<Cut>

250' 0' 250' 500'
SCALE: 1"=250'

FOR CONCEPTUAL DESIGN
ISSUED: 2023-08-21
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

MPDG HUMBOLDT WIND PORT

CUT/FILL FROM SUBGRADE

No.	Description	Date
###	###	###

Date: ####
M&N Project No: 212991-03
Drawing code:
Drawing Scale:
Plot scale: 1:1 (D SHEET)
Designed by: ####
Drawn by: ####
Checked by: ####
Submitted by: SUBMITTER'S NAME MOFFATT & NICHOL

moffatt & nichol
1300 CLAY STREET, SUITE 350
OAKLAND, CA 94612

INSERT SUB-CONSULTANT OR CLIENT LOGO AND INFO HERE

SEAL

INDEX: 01 OF ####

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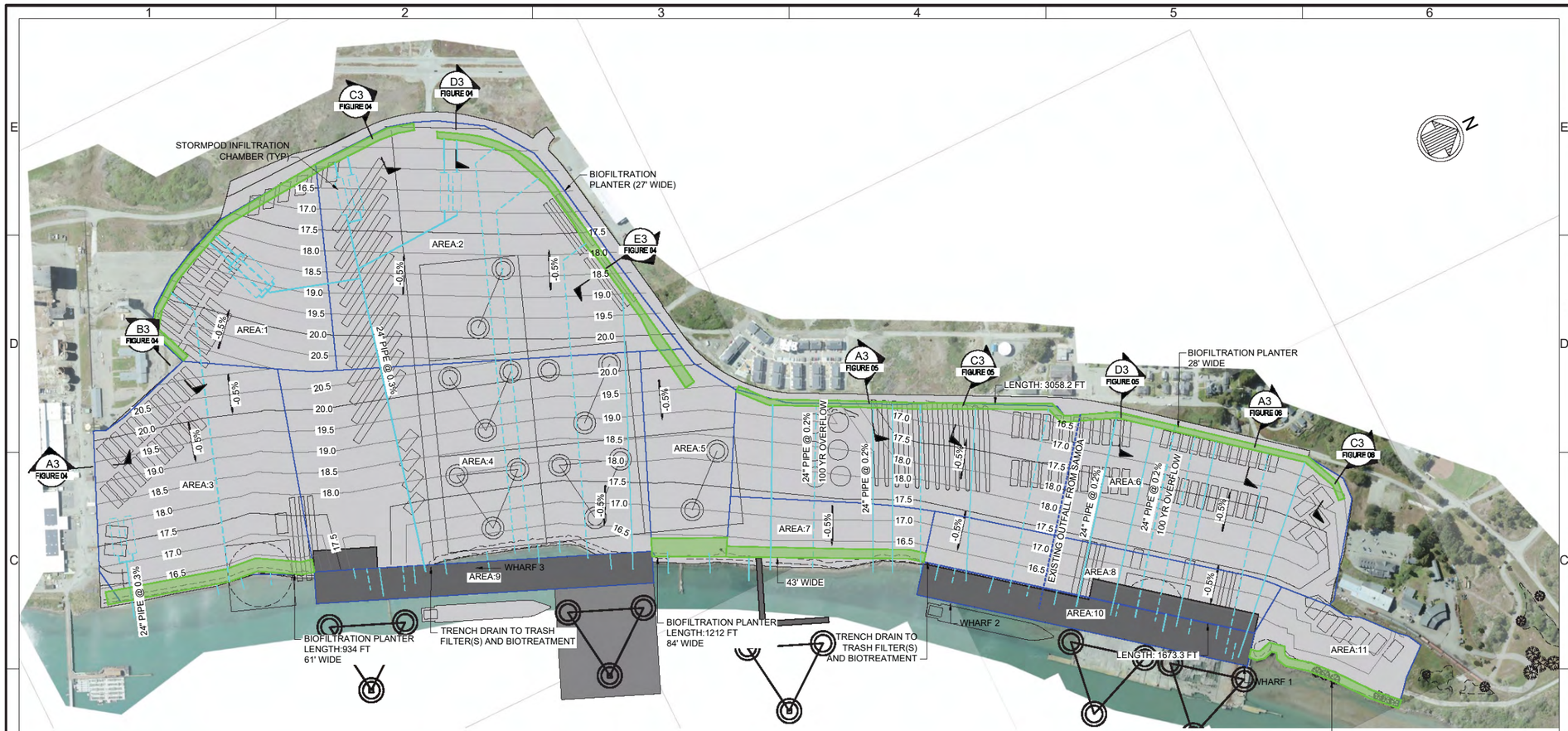
Graphics ... Humboldt Bay Harbor RMMT 104500 (4/25/2024)

Figure 14a
Cut/Fill from Subgrade



PARCEL AREA TABLE				
PARCEL #	AREA (Sq. ft)	AREA (Acres)	Q10 (cfs)	Q100 (cfs)
1	571578.18	13.12	17.3	30.12
2	1419799.14	32.59	40.24	68.68
3	914227.65	20.99	26.67	45.95
4	1568142.74	36.00	47.18	82.14
5	372498.88	8.55	11.21	18.72
6	1636522.69	37.57	54.78	94.31
7	253011.64	5.81	10.96	17.68
8	416685.85	9.57	18.05	31.76
9	240000.00	5.51	12.19	18.28
10	253572.42	5.82	12.88	19.31
11	242970.69	5.58	9.88	16.98

LEGEND:

24" PIPE

24" PIPE 100YR OVERFLOW

250' 0' 250' 500'

SCALE: 1"=250'

FOR CONCEPTUAL DESIGN
ISSUED: 2023-08-21
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

MPDG HUMBOLDT WIND PORT

GRADING AND DRAINAGE PLAN

No.	Description	Date
####	####	####

Designed by: ####
Drawn by: ####
Chd by: ####
Reviewed by: ####
Submitted by: SIGNATURE & NAME MOFFATT & NICHOL

Date: ####
M&N Project No. 212991-03
Drawing scale:
Plot scale: 1:1 (D SHEET)

1300 CLAY STREET, SUITE 350
OAKLAND, CA 94612
moffatt & nichol

INSERT SUB-CONSULTANT OR CLIENT LOGO AND INFO HERE

SEAL

INDEX: 03 OF ####

File: Q:\SEA\212991-03\20 CADD_Active_Exhibits\212991GFIG-005 ; Plotted: 11/6/2023 4:50 PM by SAMANIEGO, RUBEN ; Saved: 11/6/2023 4:03 PM by RSAMANIEGO

Graphics ... Humboldt Bay Harbor RMMT 104500 (4/25/2024)

Figure 14b
Grading and Drainage Plan

DREDGING VOLUMES		
AREA	DREDGE (Cu. Yd.)	O.D. (Cu. Yd.)
NORTH WHARF	891,070	MAX 66,865
SOUTH WHARF	1,468,105	MAX 106,495
PIER	485,950	MAX 39,565
DEVICE STORAGE 1 (INCLUSIVE OF SINKING BASIN)	681,460	MAX 76,630
SINKING BASIN	390,430	MAX 26,765
DEVICE STORAGE 2	1,871,220	MAX 174,555
TOTAL	5,397,810	MAX 464,115
UPPER 5 FT DREDGE	817,280	-

NOTES

1. LOCATION OF NAVIGATION AIDS BASED ON NAUTICAL CHART 18622 56TH ED. LAST CORRECTED ON NOVEMBER 2021.

LEGEND

- EXISTING BUOY
- EXISTING LIGHT
- (20) EXISTING CONTOUR EL
- DREDGING AND EXCAVATION
- BACKFILL AREA

ACCESS WALKWAY AT EXISTING PIER LOCATION W/ MOORING/ BREASTING DOLPHINS FOR DEVICE TEMP STORAGE

DREDGING SLOPE 2.5H:1V

E2 CN301

D2 CN301

B2 CN301

DREDGING SLOPE 2.5H:1V

PROPOSED SOUTH WHARF

BACKFILL AREA

A2 CN301

243' SLOPE TRANSITION

DREDGING SLOPE 4H:1V

EL VARIES

75'

SOUTH WHARF AREA DREDGE TO EL -40' + 2' OD

75'

DREDGING SLOPE 2.5H:1V

50'

PROPOSED NORTH WHARF

E2 CN302

200' SLOPE TRANSITION

DREDGING SLOPE 4H:1V

75.4'

E1 CN303

PIER AREA DREDGE TO EL -40' + 2' OD

NORTH WHARF AREA DREDGE TO EL -40' + 2' OD

425'

50'

DEVICE BASE STORAGE, TYP

400'

EL VARIES

D1 CN302

DEVICE BASE STORAGE 2 DREDGE TO EL -38' + 2' OD

HUMBOLDT BAY

681'

EXISTING SAMOA FEDERAL TURNING BASIN (EL -38')

EL VARIES

2084'

B1 CN302

EL VARIES

DREDGING SLOPE 4H:1V

400'

A1 CN302

1000'

MIN. 120'

DREDGING SLOPE 4H:1V

SINKING BASIN DREDGE TO EL -60' + 2' OD

DREDGING SLOPE 4H:1V

3489'

DEVICE BASE STORAGE 1 DREDGE TO EL -38' + 2' OD

1880'

939'

EXISTING EUREKA CHANNEL INNER REACH (EL -38')

300' 0' 300' 600'

SCALE: 1"=300'

15% DESIGN
ISSUED: 2024-01-19
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"X34" DRAWING

HUMBOLDT BAY HARBOR, RECREATION & CONSERVATION DISTRICT

Rev.	Description	Date	Appr.
A.	15% SUBSGN	2024-01-19	EP

REDWOOD MARINE MULTIPURPOSE TERMINAL REPLACEMENT PROJECT

DREDGE PLAN

Date: 2023-12-07 | Rev.: A.
Designed by: YN | Ckd by: MJ | M&N Project No.: 212991-03
Dwn by: RG | Reviewed by: EC | Submitted by: MOFFATT & NICHOL | Drawing scale:
Plot scale: 1:1 (D SHEET) | Drawing Scale:

1300 CLAY STREET, SUITE 300
OAKLAND, CA 94612
moffatt & nichol

SEAL

Sheet Reference No.
CN101
INDEX: 18 OF 52

Figure 15a
Dredge Plan

ROCK REVETMENT VOLUMES	
AREA	ROCK (Cu. Yd.)
NORTH WHARF	49,750
SOUTH WHARF	50,700
PIER	30,550
SHORE PROTECTION - REACH 1	4,500
SHORE PROTECTION - REACH 2	5,000
SHORE PROTECTION - REACH 3	4,250
TOTAL	144,750

NOTES

1. LOCATION OF NAVIGATION AIDS BASED ON NAUTICAL CHART 18622 56TH ED. LAST CORRECTED ON NOVEMBER 2021.

LEGEND

- EXISTING BUOY
- EXISTING LIGHT
- (20) EXISTING CONTOUR EL
- ROCK REVETMENT
- BACKFILL AREA

A1 CN309
E2 CN307
D2 CN307
B2 CN307
C1 CN309
A2 CN308
E2 CN308
D1 CN309

BACKFILL AREA
PROPOSED SOUTH WHARF
PROPOSED NORTH WHARF
REACH 3 SHORE PROTECTION
SOUTH WHARF AREA DREDGED TO EL -40'
SLOPE 2.5H:1V
ROCK REVETMENT
REACH 2 SHORE PROTECTION
PIER AREA DREDGED TO EL -40'
NORTH WHARF AREA DREDGED TO EL -40'
SLOPE 2.5H:1V
REACH 1 SHORE PROTECTION
400'
DEVICE BASE STORAGE 2 DREDGED TO EL -38'
HUMBOLDT BAY
EXISTING SAMOA FEDERAL TURNING BASIN (EL -38')
1000'
SINKING BASIN DREDGED TO EL -60'
DEVICE BASE STORAGE 1 DREDGED TO EL -38'
EXISTING EUREKA CHANNEL INNER REACH (EL -38')

300' 0' 300' 600'
SCALE: 1"=300'

15% DESIGN
ISSUED: 2024-01-19
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22 X34" DRAWING

HUMBOLDT BAY HARBOR, RECREATION & CONSERVATION DISTRICT

Mark	Description	Date	Appr
A	15% DESIGN	2024-01-19	SP

REDWOOD MARINE MULTIPURPOSE TERMINAL REPLACEMENT PROJECT

ROCK REVETMENT PLAN

Rev: A
Date: 2023-12-07
M&N Project No: 212991-03
Drawing scale:
Drawing Scale: 1:1 (D SHEET)
Plot scale: 1:1 (D SHEET)
Designed by: YN
Drawn by: RG
Checked by: MJ
Reviewed by: EC
Submitted by: MOFFATT & NICHOL

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OAKLAND, CA 94612
moffatt & nichol

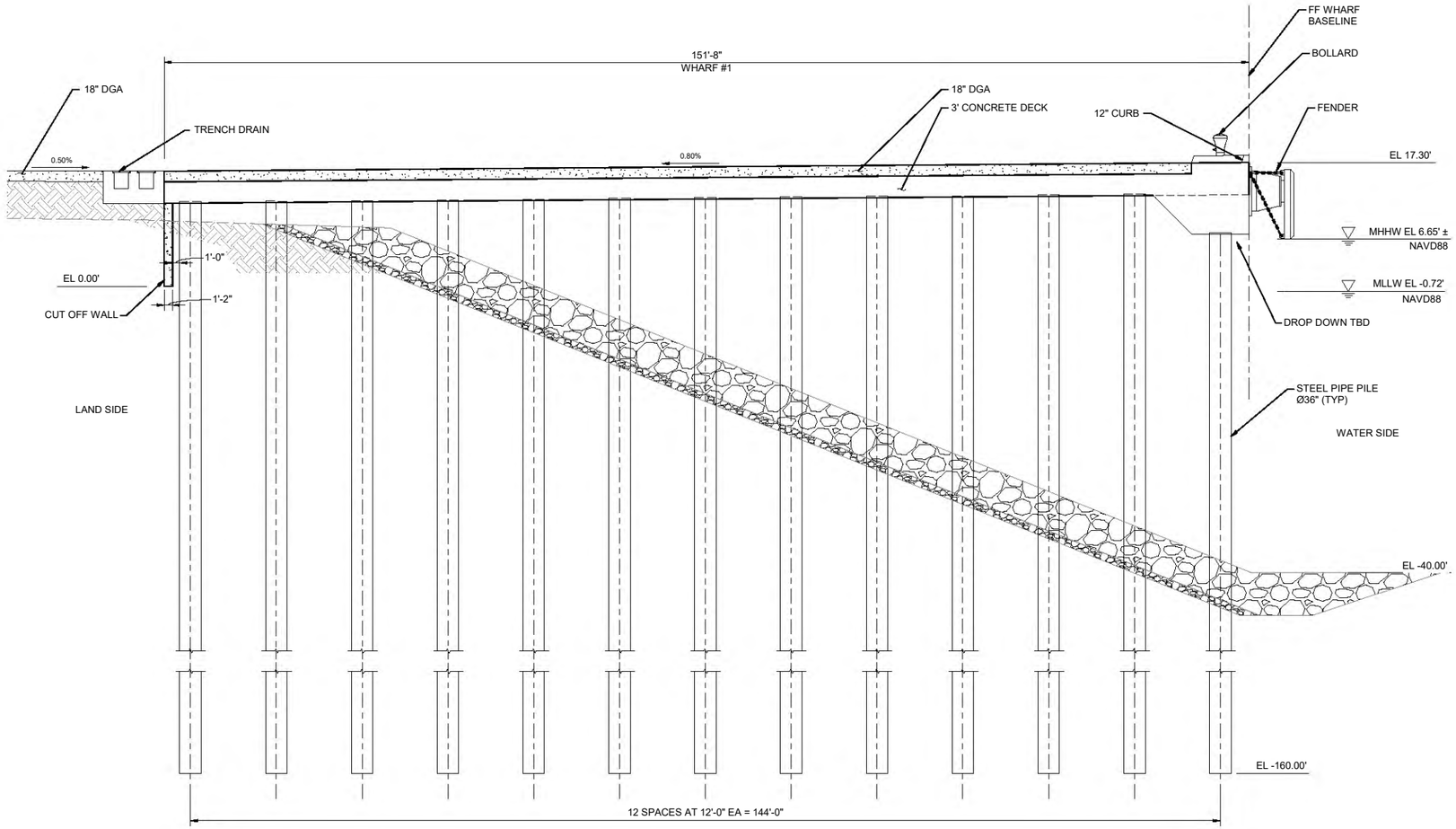
SEAL

Sheet Reference No.
CN102
INDEX: 19 OF 52

File: Q:\SEA\212991-03\20 CADD_Active_Cpl\212991\03-CN102; Plotted: 1/30/2024 1:09 PM by: LUO, CARO(JNA ; Saved: 1/24/2024 4:33 PM by: CLUO

Graphics ... Humboldt Bay Harbor RMMT 104500 (4/25/2024)

Figure 15b
Rock Revetment Plan



B1 / S-301 SECTION - NORTH WHARF #1
1/8" = 1'-0"

8'-0" 0'-0" 8'-0" 16'-0"
SCALE: 1/8"=1'-0"

DRAFT NOT FOR DISTRIBUTION
15% DESIGN
ISSUED: 2024/01/19
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

REDWOOD MARINE MULTIPURPOSE TERMINAL REPLACEMENT PROJECT

WHARF TYPICAL CROSS SECTION 1

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OAKLAND, CA 94612
moffatt & nichol

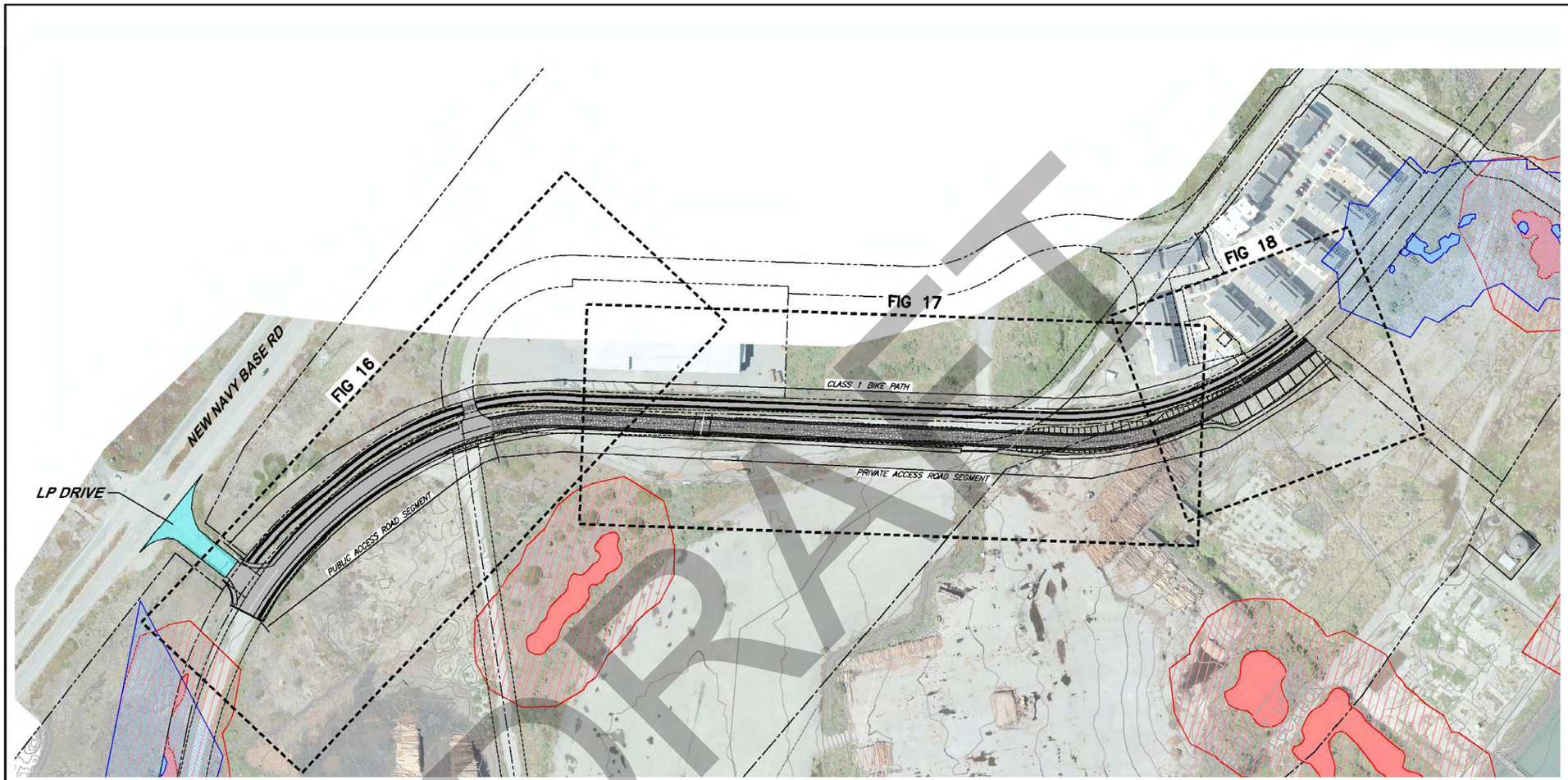
Sheet Reference No.
S-301
INDEX: 34 OF 39

Graphics ... Humboldt Bay Harbor RMMAT 104500 (4/25/2024)

Figure 16
Wharf Typical Cross Section 1

Graphics ... Humboldt Bay Harbor RMMT 104500 (4/25/2024)

Figure 17
Potential Intersection Improvements



NOTE:

EXISTING GROUND TOPOGRAPHIC SURFACE MAY NOT ACCURATELY REPRESENT ACTUAL GROUND SURFACE IN VEGETATED AREAS. A MORE ACCURATE TOPOGRAPHIC SURFACE IS NEEDED FOR FURTHER DESIGN EFFORTS.

PLAN

LEGEND

- AC PAVING
- GRAVEL SHOULDER
- GRAVEL LANE
- NON-WETLAND ESHA AREA
- NON-WETLAND ESHA BUFFER
- WETLAND AREA
- WETLAND BUFFER
- IMPROVED COUNTY ROADWAYS

SAVED: 3/15/2024 3:52 PM JFOSTER, PLOTTED: 3/15/2024 4:21 PM JOHN FOSTER
P:\Eureka\2022\022054-Humboldt-RMMT\Dwgs\022054-MM-VIABLE.dwg

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET ADJUST SCALES ACCORDINGLY

SHN
812 W. WABASH AVE.
EUREKA, CA. 95501
WWW.SHN-ENGR.COM
707-441-8855

NO.	DATE	REVISION	BY

DSGN
DR CDN/JWF
CHK JSO
APVD

REDWOOD MARINE MULTIPURPOSE TERMINAL
REPLACEMENT PROJECT
SAMOA, CALIFORNIA

WEST ACCESS ROAD & GRTA TRAIL
MINIMUM VIABLE PROJECT

SHEET FIG
SEQ
DATE 02/2024
PROJ. NO. 022054

Graphics ... Humboldt Bay Harbor RMMT 104500 (4/25/2024)

Figure 18
West Access Road & GRTA Trail

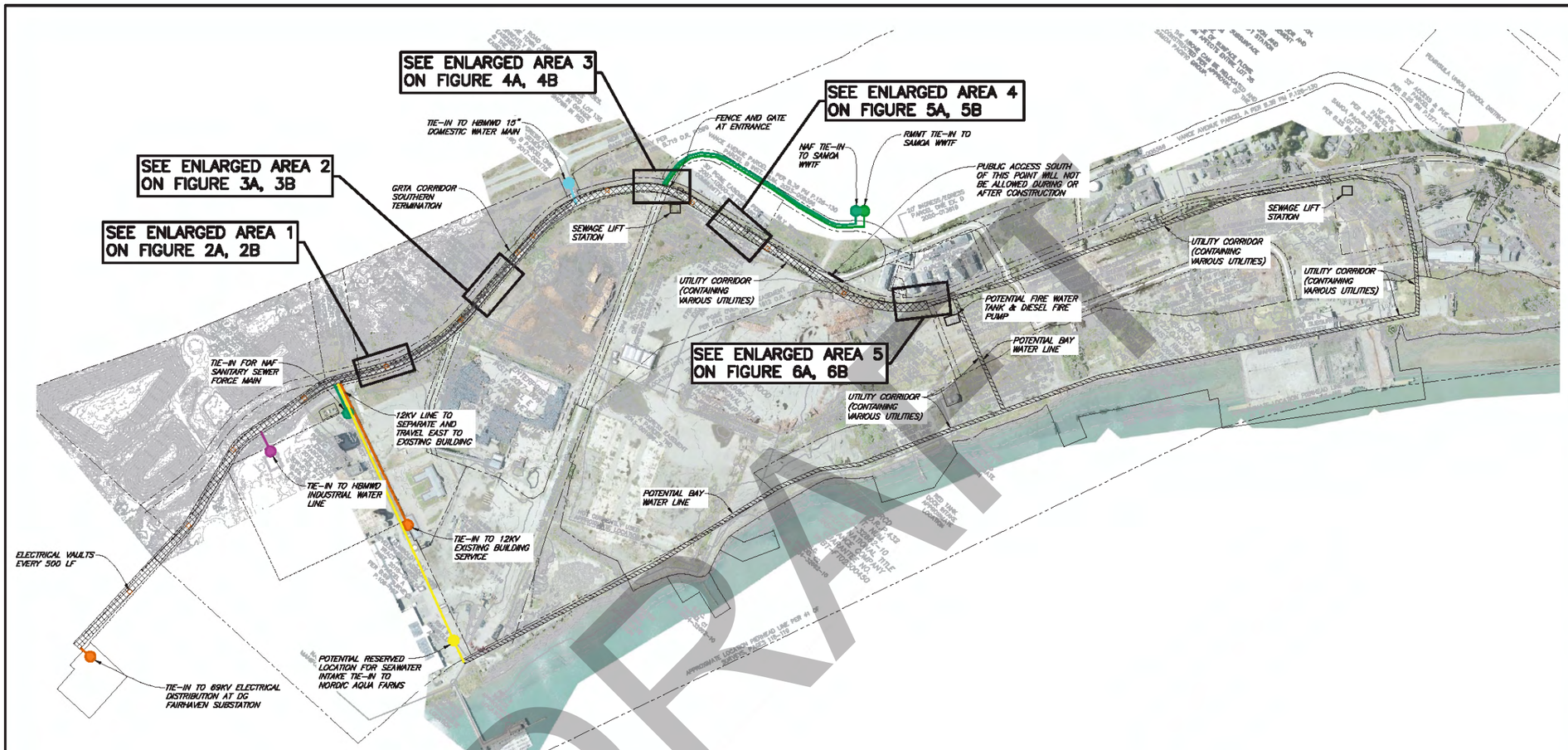


FIGURE TITLE DESCRIPTIONS

#A – UTILITIES SHIFTED WEST WITHIN RAILROAD/GRTA CORRIDOR.
NOTE: THE GRTA/RAILROAD CORRIDOR TEMINATES SOUTH OF LP DRIVE. THE UTILITY ALIGNMENT CONTINUES ON THE SAME PATH SOUTH OF THE GRTA CORRIDOR TERMINATION.

#B – UTILITIES SHIFTED TO THE EAST OUTSIDE OF THE RAILROAD/GRTA CORRIDOR.

LEGEND

- ELECTRICAL DISTRIBUTION TIE-IN
- 12" INDUSTRIAL WATER TIE-IN
- 12" DOMESTIC WATER TIE-IN
- 6" SANITARY SEWER TIE-IN
- 6" NAF SANITARY SEWER TIE-IN
- UTILITY RESERVED SPACE
- ELECTRICAL VAULT
- OFF-SITE UTILITY CORRIDOR
- ON-SITE UTILITY CORRIDOR
- FENCE

PLAN 0 300

UTILITY PLAN ASSUMPTIONS:

1. PUBLIC ROAD SECTION 12' PAVED ROAD, 8' PAVED SHOULDER, 2' GRAVEL SHOULDER, AND 10' VEGETATED STRIP.
2. IT WILL BE ACCEPTABLE TO PLACE UTILITIES WITHIN THE RAILROAD CORRIDOR.
3. GAS WILL BE REQUIRED FOR RELOCATED UTILITIES ON-SITE, AND WOULD BE PLACED IN JOINT TRENCH BY OTHERS.
4. JOINT TRENCH WILL NOT CROSS BIO-SWALE.
5. JOINT TRENCH WILL REQUIRE 3' SET-BACK ON EITHER SIDE TO ACCOMMODATE WET UTILITIES AND STORMWATER FEATURES.
6. JOINT TRENCH IS 3' WIDE, BUT IS TO BE DESIGNED BY OTHERS.
7. SEAWATER INTAKE OR STORM DRAIN SPACE IS RESERVED.
8. 4' DRAIN INLETS WILL BE REQUIRED ALONG THE STORM DRAIN LINE.
9. THE LOCATIONS OF THE EXISTING SAMOA UTILITIES ARE NOT BASED ON SURVEY INFORMATION.
10. THE EXISTING SAMOA UTILITIES MEET CODE REQUIRED SEPARATION REQUIREMENTS.
11. WE HAVE ASSUMED A CLASS 1 BIKE TRAIL WILL BE CONSTRUCTED ON THE CENTERLINE OF THE RAILROAD/GRTA TRAIL CORRIDOR.
12. ASSUMED SIZES FOR UTILITIES ARE AS FOLLOWS, LOADS ARE REQUIRED TO COMPLETE SIZING:
    - 12" INDUSTRIAL WATER
    - 12" DOMESTIC WATER
    - 6" SANITARY SEWER
    - UTILITY RESERVED SPACE
13. THE UTILITY CORRIDOR INCLUDES ELECTRICAL AND GAS THAT WILL BE RE-ROUTED FROM THE PROJECT SITE AND PLANNED NORDIC AQUA FARMS DOMESTIC WATER LINE.

PRELIMINARY

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"
IF NOT ONE INCH ON THIS SHEET ADJUST SCALES ACCORDINGLY

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707-441-8855

NO.	DATE	REVISION	BY

DESIGN CC
DR CDN/JWF
CHK JSD
APVD

REDWOOD MARINE MULTIPURPOSE TERMINAL REPLACEMENT PROJECT
SAMOA, CALIFORNIA

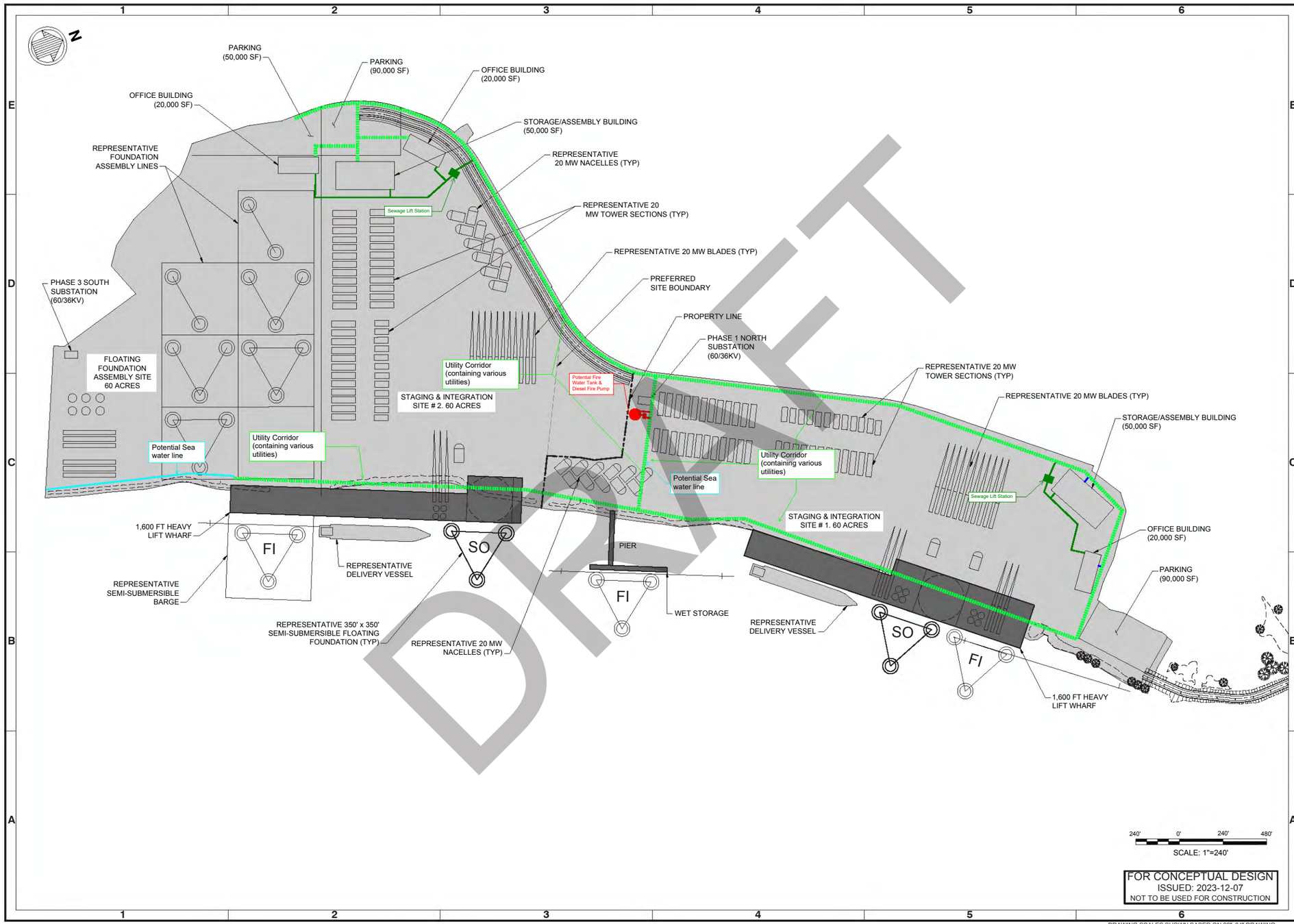
PROJECT OVERVIEW

SHEET
SEQ
DATE 01/2024
PROJ. NO. 022054

SAVED: 1/10/2024 8:12 AM JFOSTER, PLOTTED: 1/10/2024 8:13 AM JOHN FOSTER
P:\Eureka\2022\022054-Humboldt-RMMT\Dwgs\022054-UTIL-F10-ALT.dwg

Graphics ... Humboldt Bay Harbor RMMAT 104500 (4/25/2024)

Figure 19
Project Overview



REDWOOD MARINE MULTIPURPOSE TERMINAL REPLACEMENT PROJECT

CONCEPTUAL SITE USE

1300 CLAY STREET, SUITE 350
OAKLAND, CA 94612
moffatt & nichol

INSERT SUB-CONSULTANT OR CLIENT LOGO AND INFO HERE

SEAL

Sheet Reference No.
G-103
INDEX: 5 OF 38

Rev. - | Date: 2023-12-07 | M&N Project No.: 212991-03 | Drawing code: | Drawing Scale: Plot scale: 1:1 (D SHEET)
Designed by: - | Drawn by: OA | Checked by: MJ | Reviewed by: EC | Submitted by: SUBMITTERS NAME MOFFATT & NICHOL

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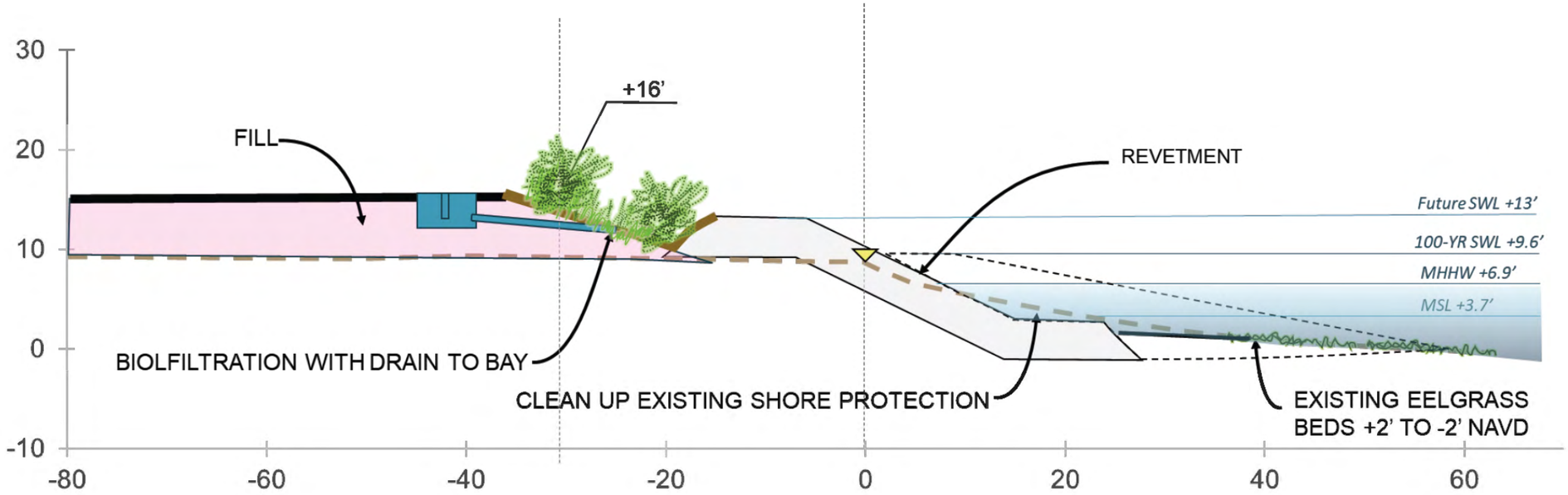
Graphics ... Humboldt Bay Harbor RMMT 104500 (4/25/2024)

Figure 20
Conceptual Site Use

Shoreline Stabilization (Humboldt)

A – Revetment

Estimated length ≈ 850 ft (≈ 250m)



Project sample section (A)

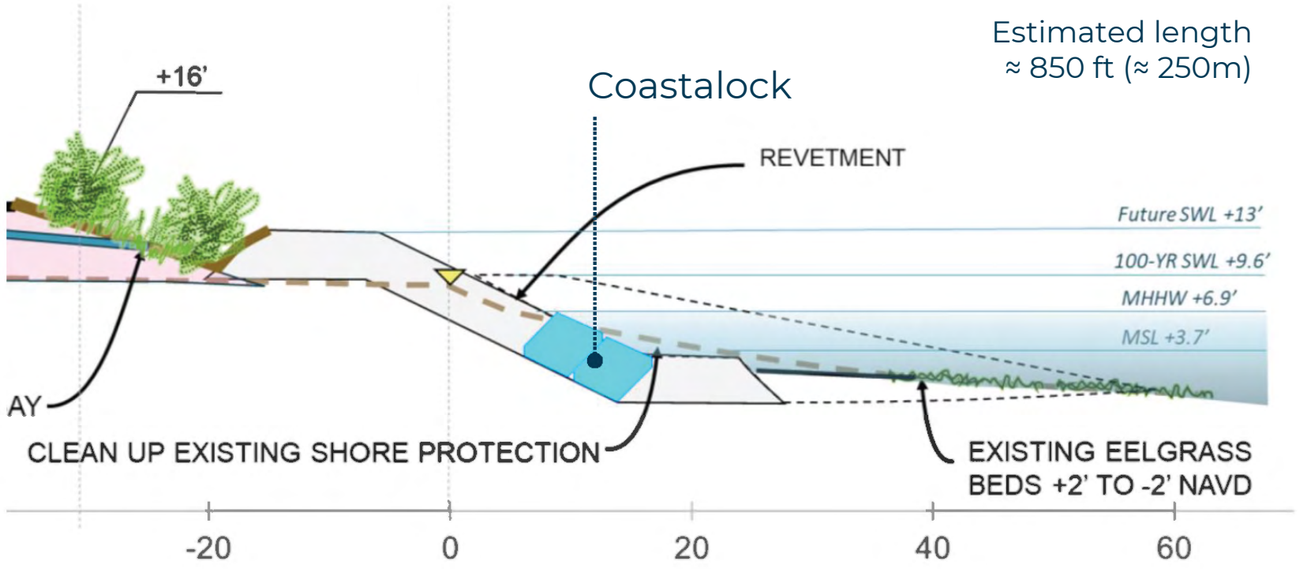
ECONCRETE

Graphics, ... Humboldt Bay Harbor RMMT 104500 (4/25/2024)

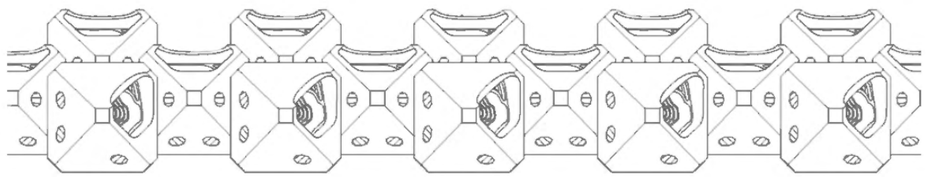
Figure 21
Shoreline Stabilization—Revetment

Shoreline Stabilization (Humboldt)

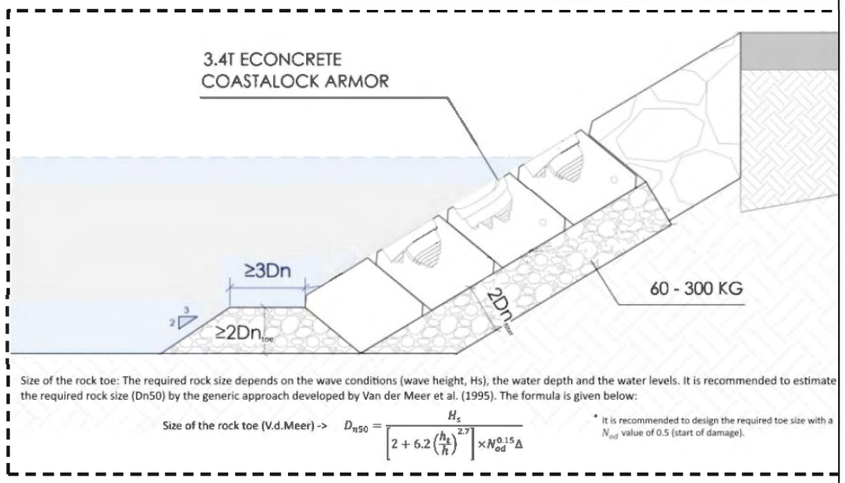
A – Revetment - Coastalock



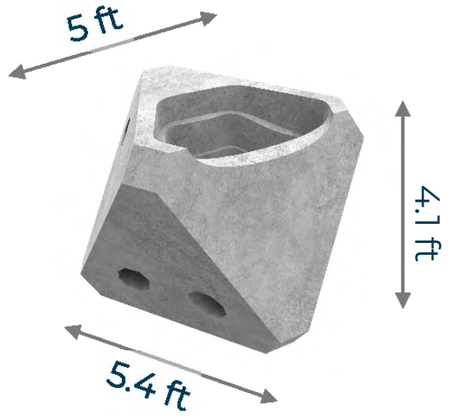
Project sample section (A), with 3 rows of Coastalocks



Elevation, interlocking placement (3 rows of Coastalocks)



Coastalock integration in a revetment (general concept)



Volume (~1.86 yd³)
Weight (~7,515 lbs)

ECONCRETE

Graphics – Humboldt Bay Harbor RMMT 104500 (4/25/2024)

Figure 22
Shoreline Stabilization—Revetment/Coastalock

Graphics ... Humboldt Bay Harbor RMMT 104500 (4/25/2024)

REDWOOD MULTIPURPOSE
MARINE TERMINAL
REPLACEMENT PROJECT

FOR CONCEPTUAL DESIGN
ISSUED: 2023-12-17
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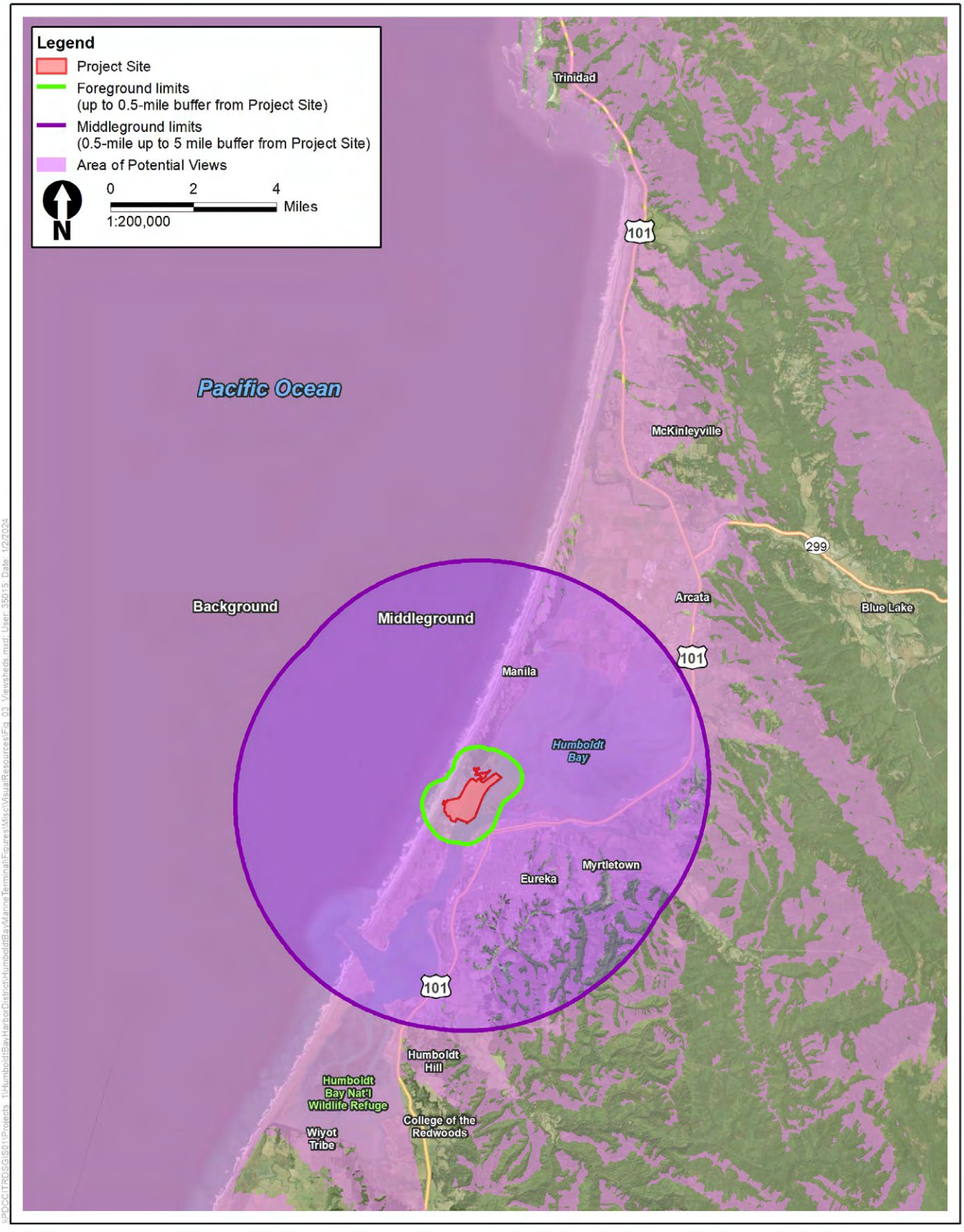
DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

Sheet
Reference No.

Figure 23
Electrical General Distribution

Appendix B
IS Figures



Graphics ... Humboldt Bay Harbor RMMT 104500 IS (4/25/2024)

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Figure A
Viewsheds

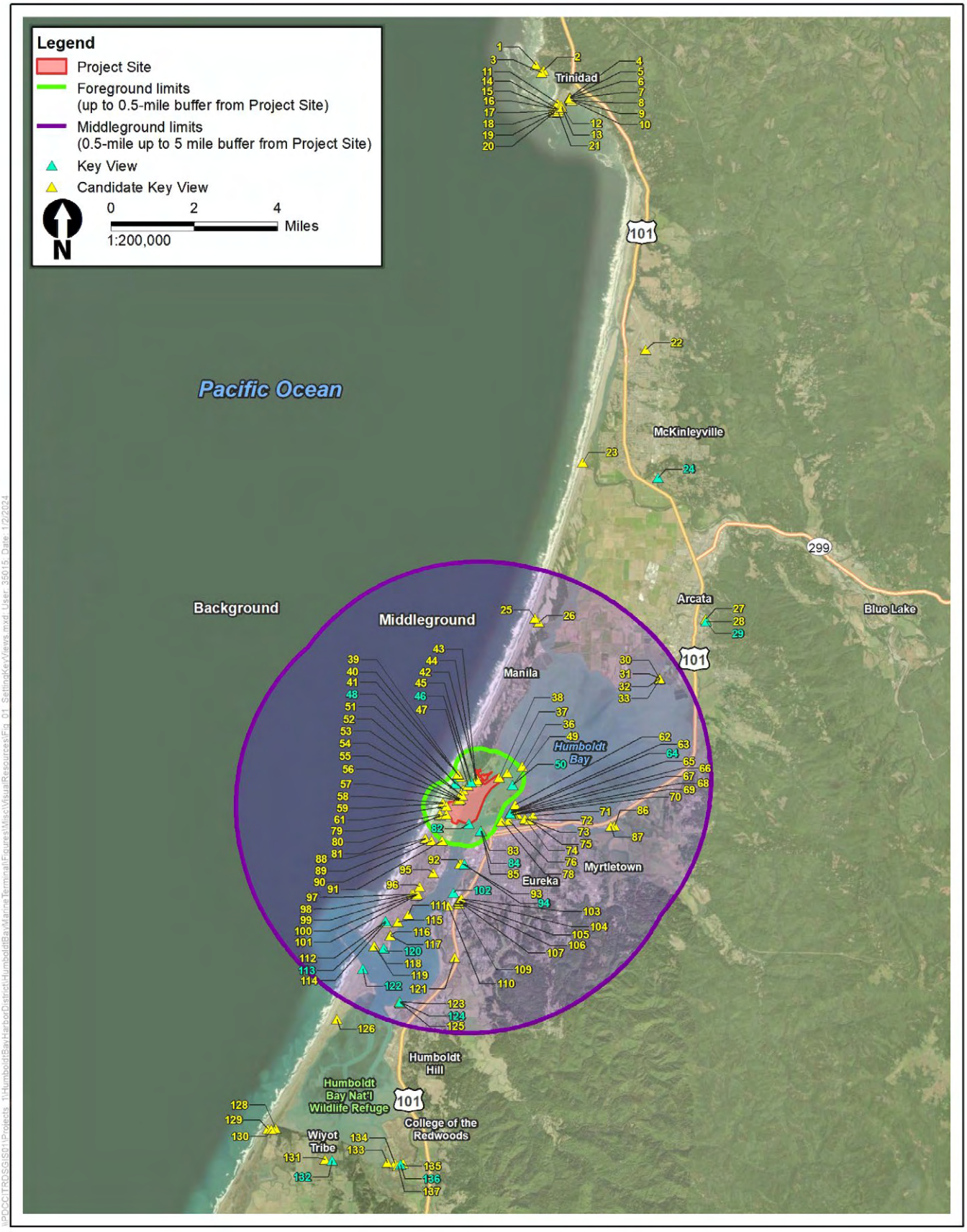


Figure B
Setting Key Views

KV 82. Humboldt Bay. Foreground view from the bay looking northwest toward the project site.

KV 113. Samoa Dunes Recreation Area. Middleground view looking northeast from the BLM scenic overlook off Bunker Road toward the project site.

Figure C-1
Key View Photos 82 and 113

KV 120. Samoa Dunes Recreation Area. Middleground view looking north toward the project site from New Navy Base Road that includes views of the historic Humboldt Bay Life-Saving Station.

KV 48. Samoa. Immediate foreground view looking east from the residential area toward the project site.

Figure C-2
Key View Photos 120 and 48

KV 46. Samoa. Immediate foreground view looking southeast from the residential area toward the project site.

KV 95. Fairhaven. Middleground view looking northeast from the residential area toward the project site.

Figure C-3
Key View Photos 46 and 95

KV 122. South Spit. Middleground view looking northeast from the recreational area toward the project site.

KV 64. Woodley Island. Middleground view from The Fisherman statue, near the Indian/Gunther Island National Historic Landmark monument marker, looking northwest toward the project site.

Figure C-4
Key View Photos 122 and 64

KV 50. Tuluwat Island. Middleground view from SR 255 on the island looking west toward the project site.

KV 84. Eureka Public Marina. Middleground view from the public marina looking northwest toward the project site.

Figure C-5
Key View Photos 50 and 84

KV 102. Eureka Waterfront Trail. Middleground view from the public trail looking north toward project site.

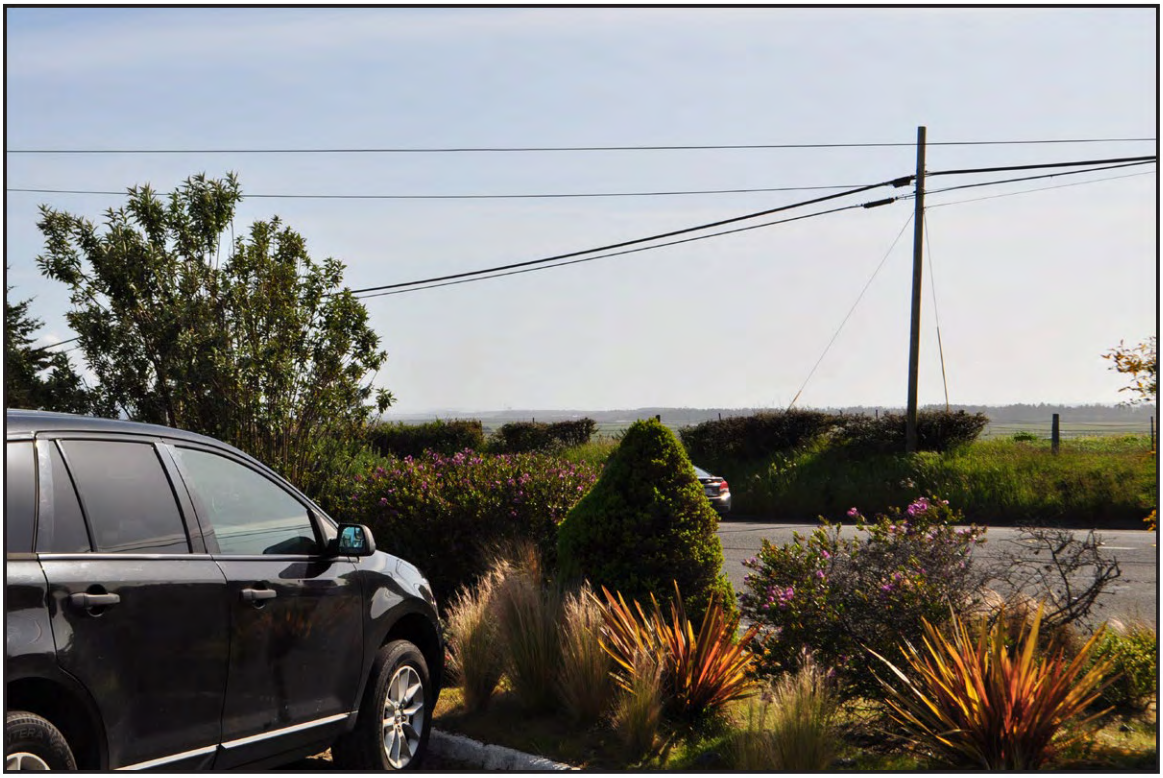
KV 124. King Salmon. Background view from the public beach looking northeast toward project site.

Figure C-6
Key View Photos 102 and 124

KV 136. Humboldt Bay National Wildlife Refuge. Background view from the wildlife refuge looking northeast toward project site.

KV 132. Table Bluff Road. Background view looking north from the roadway toward the project site.

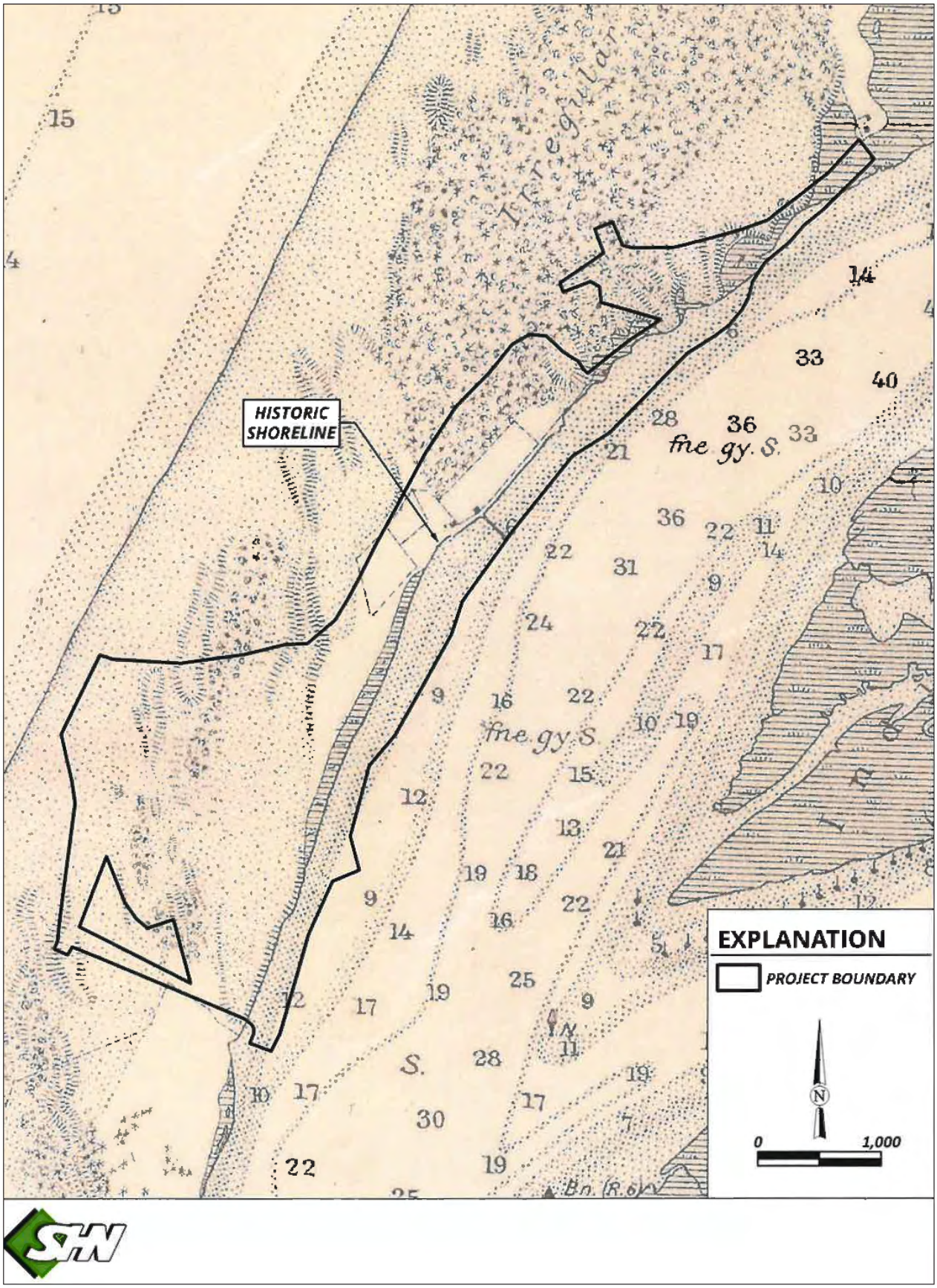
Figure C-7
Key View Photos 136 and 132



KV 24. Six Rivers Brewery. Background view looking southwest from the business toward the project site.

KV 29. Humboldt State University. Background view looking southwest from the educational establishment toward the project site.

Figure C-8
Key View Photos 24 and 29

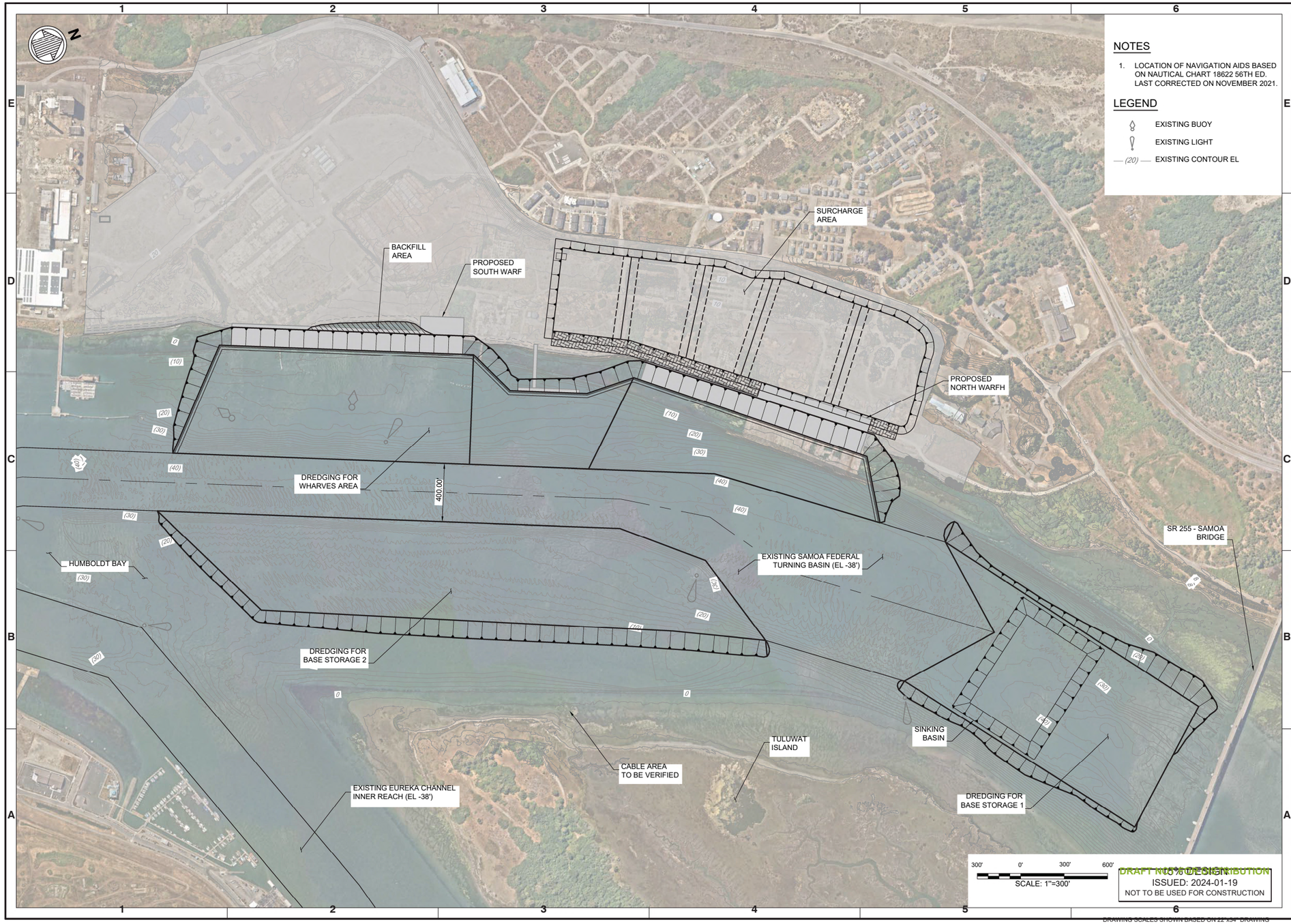


Graphics ... Humboldt Bay Harbor RMMT 104500 IS (4/25/2024)

Figure D
Historical Humboldt Bay Survey
U.S. Coast and Geodetic Survey, 1894

Source: Unknown

Figure E
Historic Oblique Aerial Image (ca. 1950s-1960s), View to South



HUMBOLDT BAY HARBOR RECREATION & CONSERVATION DISTRICT

Rev	Date	Description	By
A	15th DESIGN	2024-01-16	SP

REDWOOD MARINE MULTIPURPOSE TERMINAL REPLACEMENT PROJECT

DREDGE FILL SITE PLAN

Designed by: YN	Rev: A -
Drn by: RG	Chk'd by: MJ
Reviewed by: EC	Submitted by: MOFFATT & NICHOL
Date: 2023-12-07	M&N Project No. 212991-03
Drawing code:	Drawing Scale:
Plot scale: 1:1 (D SHEET)	

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OAKLAND, CA 94612
moffatt & nichol

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Sheet Reference No.
CN100
INDEX: 15 OF 39

DRAWING SCALES SHOWN BASED ON 22 X34" DRAWING

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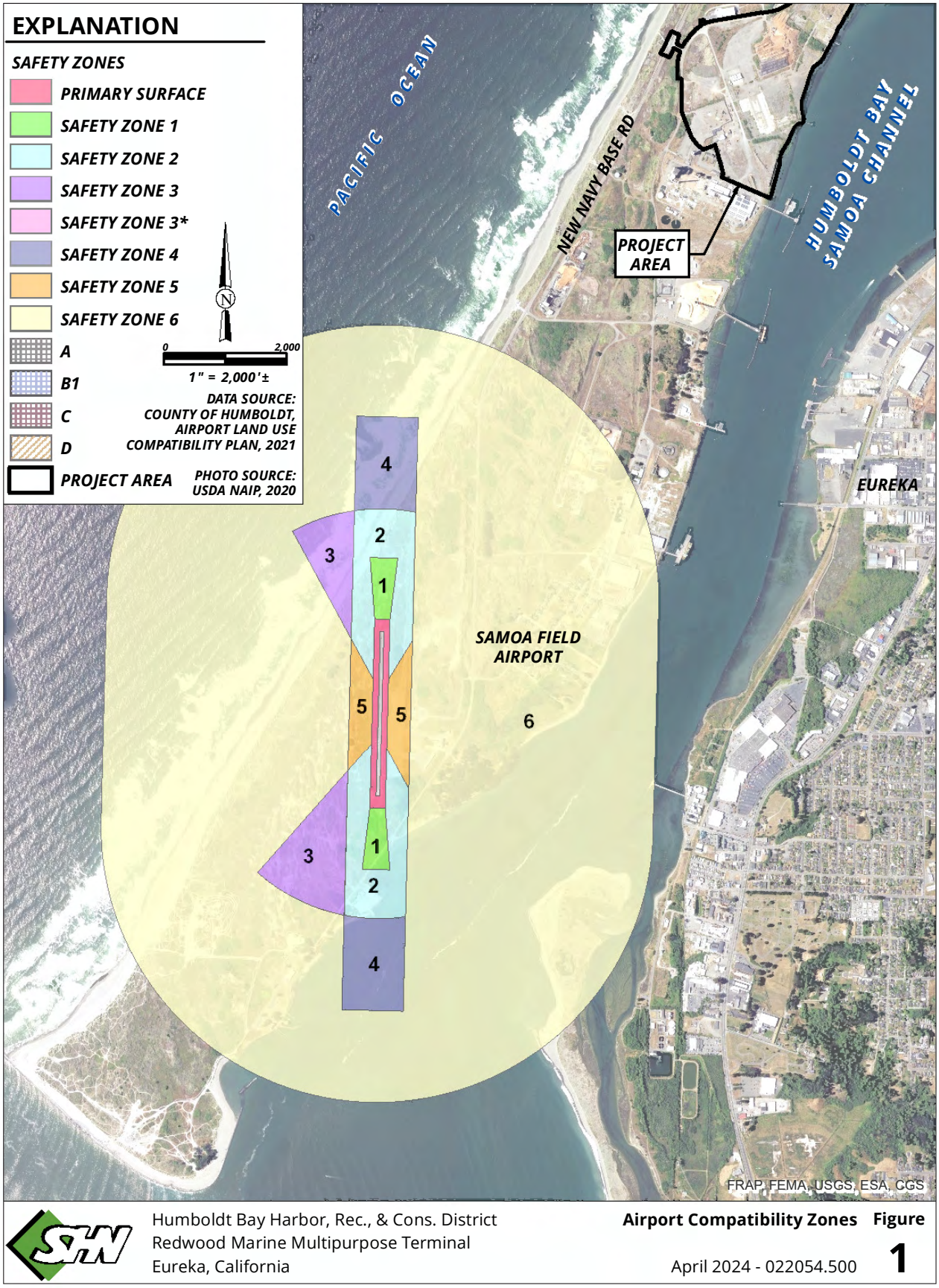
Graphics: ... Humboldt Bay Harbor RMMT 104500 IS (4/25/2024)

Figure F
Dredge Fill Site Plan



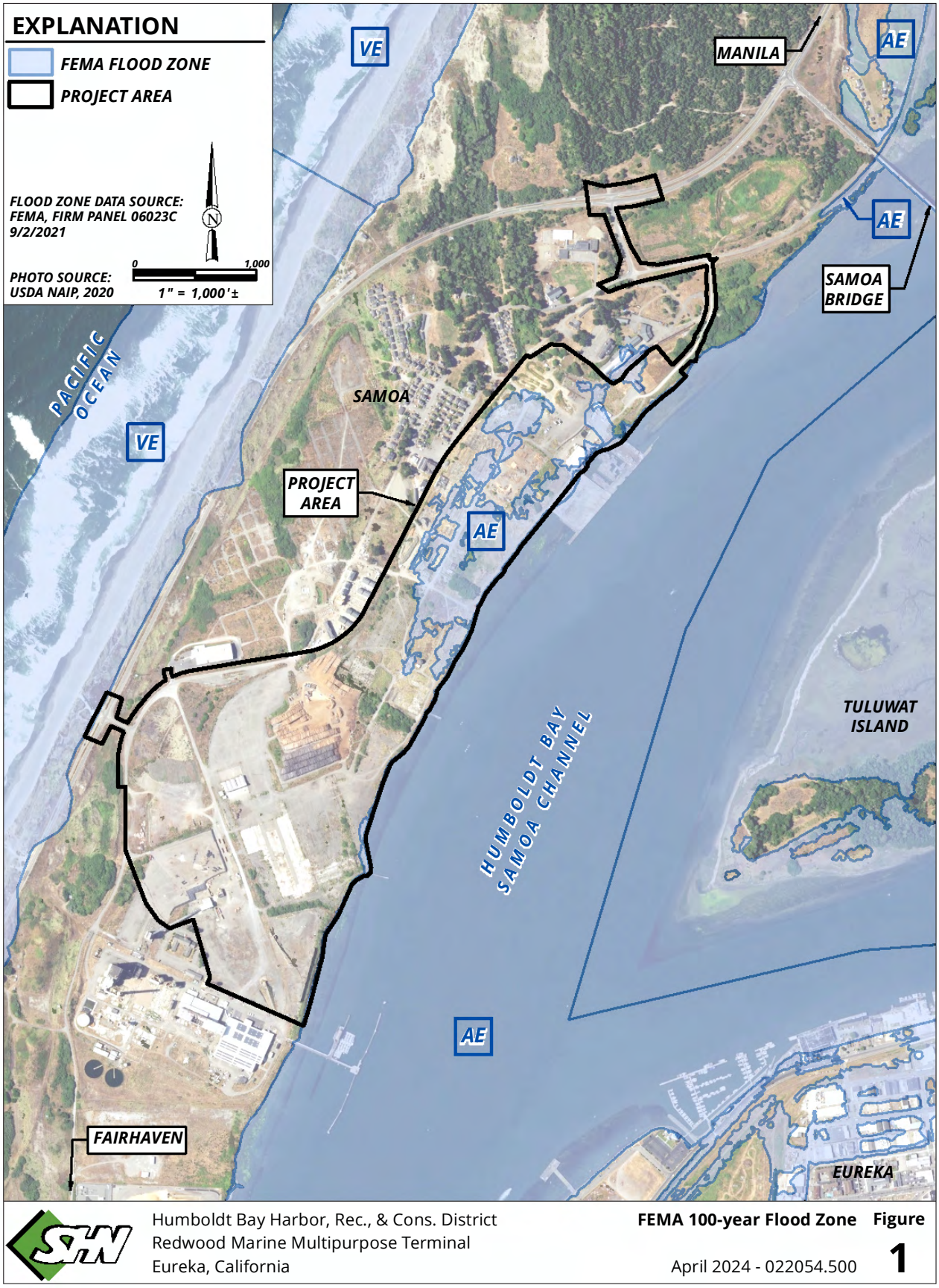
Humboldt Bay Harbor, Rec., & Cons. District
Redwood Marine Multipurpose Terminal
Eureka, California

Airport Compatibility Zones **Figure 1**

April 2024 - 022054.500

Graphics ... Humboldt Bay Harbor RMMT 104500 IS (4/25/2024)

Figure G
Airport Compatibility Zones



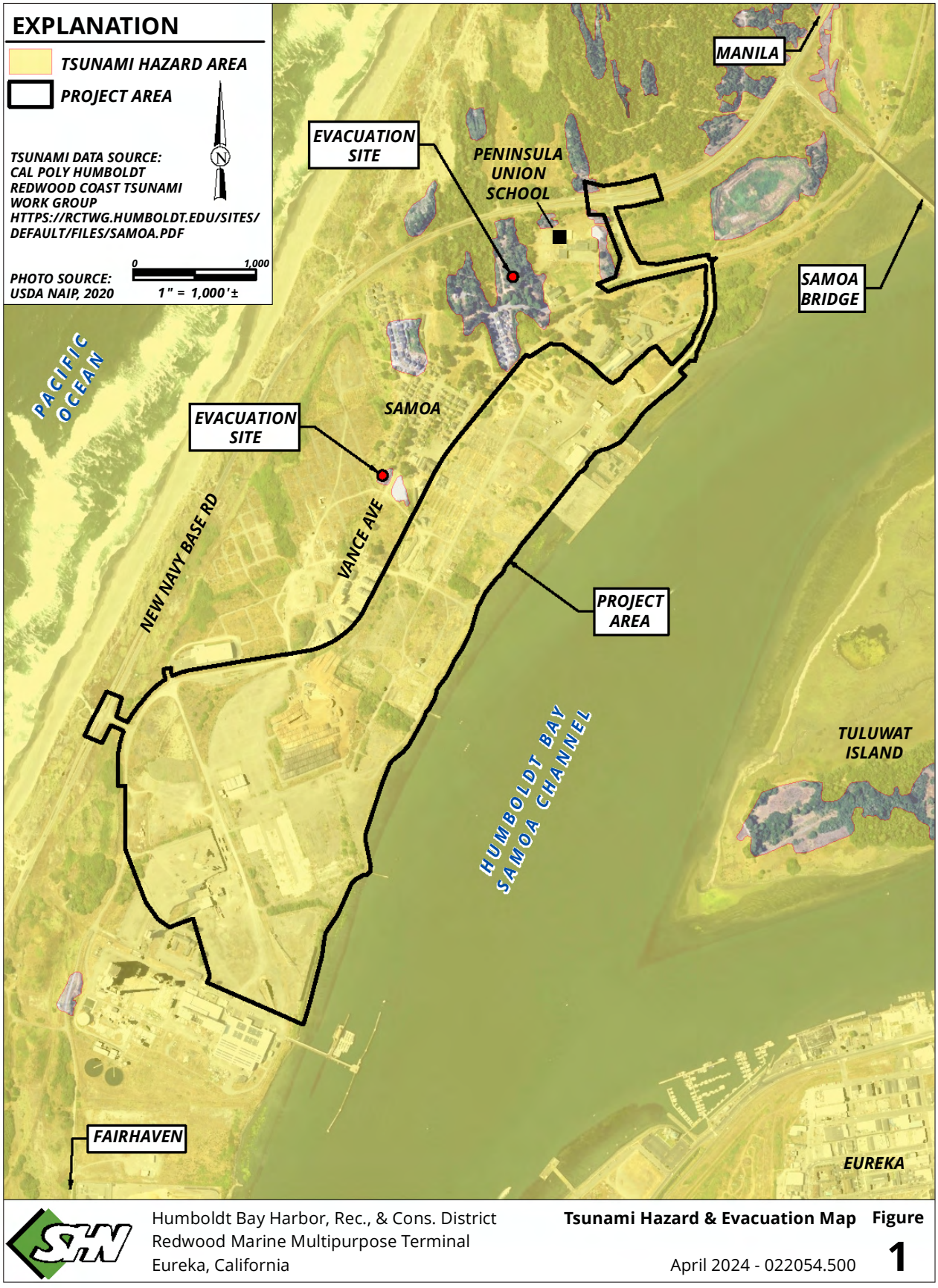
Humboldt Bay Harbor, Rec., & Cons. District
Redwood Marine Multipurpose Terminal
Eureka, California

FEMA 100-year Flood Zone **Figure 1**

April 2024 - 022054.500

Graphics ... Humboldt Bay Harbor RMMT 104500 IS (4/25/2024)

Figure H
FEMA 100-Year Flood Zone



Humboldt Bay Harbor, Rec., & Cons. District
Redwood Marine Multipurpose Terminal
Eureka, California

Tsunami Hazard & Evacuation Map **Figure 1**

April 2024 - 022054.500

Graphics ... Humboldt Bay Harbor RMMT 104500 IS (4/25/2024)

Figure I
Tsunami Hazard and Evacuation Map

Appendix C

Visual Impacts Methods of Analysis

Appendix C

Visual Impacts Methods of Analysis

C.1 Introduction

This appendix supports the *Aesthetics* section and discusses the methods of analysis used for the aesthetics analysis. Visual impacts are determined by assessing changes to visual resources within a study area and predicting viewer response to those changes. To do so, it is first necessary to establish the visual resources study area, inventory the baseline conditions (or existing environmental setting) within the study area, and identify potentially affected viewer groups. Viewer response to changes in the visual environment, combined with the degree of the resource change, determines the extent of visual impacts caused by the construction and operation of a proposed project. Impacts on visual resources can be either beneficial or detrimental. A generalized visual impact assessment process is illustrated in Figure C-1.

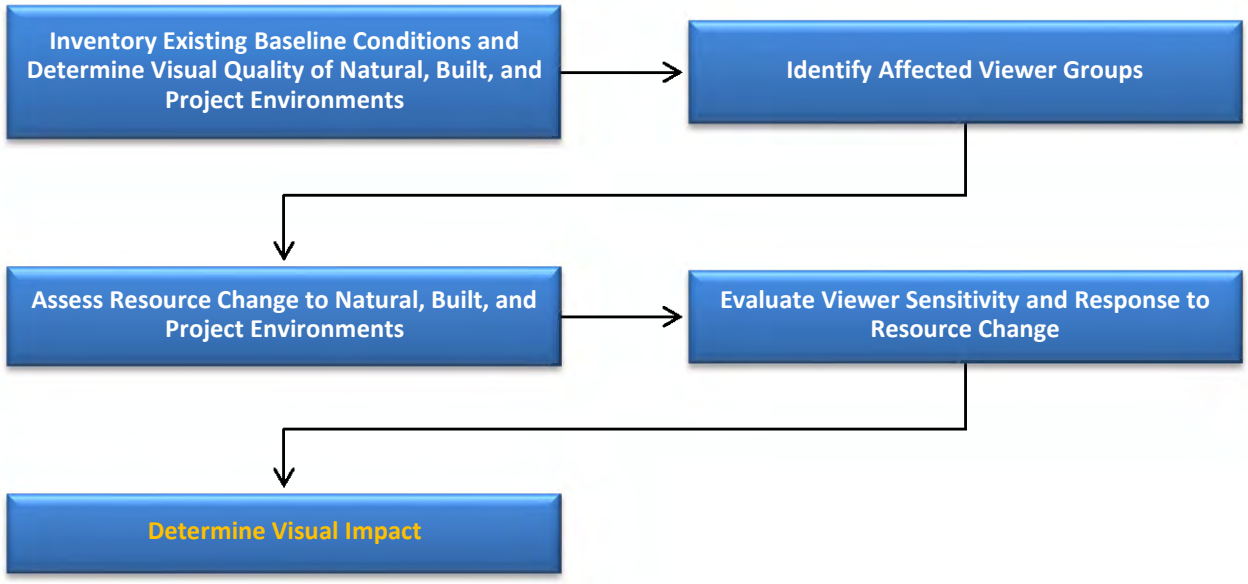


Figure C-1. Visual Assessment Process

C.2 Methods for Analysis

The physical context in which a proposed project or alternative would be located is a key consideration when analyzing whether the project or alternative will have significant impacts on aesthetic and visual resources. Identifying an area's aesthetic resources and conditions involves the following three steps.

1. Objective identification of the visual features (i.e., aesthetic resources) of the landscape, including whether there are any designated scenic vistas or state scenic highways.

2. Assessment of the character and quality of those resources relative to overall regional visual character.
3. Determination of the importance to people, or sensitivity, of views of aesthetic resources in the landscape.

The research and analysis methods used to determine the effects are described in detail herein, and are based on the Federal Highway Administration's (FHWA's) *Guidelines for the Visual Impact Assessment of Highway Projects* (FHWA Guidelines) (Federal Highway Administration 2015: 4-5–6-8). The FHWA Guidelines' approach addresses analysis of the natural environments and built environments (i.e., human-altered/built environments). These guidelines include a phased approach to analyzing existing aesthetic resources and the future condition with the project alternative using changes in visual quality and the sensitivity of viewers (i.e., receptors) to determine aesthetics and visual impacts. The analysis determines potential impacts of the alternatives during both the construction and operational phases.

The focus of this visual analysis is on the alternatives' potential to adversely affect views from publicly accessible locations. Publicly accessible locations in the communities from which residents would view the study area are therefore considered to be of primary importance in this analysis. The impact assessment methodology for aesthetic and visual resources includes the following components:

- Establish the study area for aesthetics resources.
- Inventory and describe the environmental setting, affected viewers, and existing visual quality.
- Identify candidate key views (cKVs), key views (KVs) for use in establishing the environmental setting, and KVs for simulating or simulated KVs (SKVs) for illustrating project impacts. The 16 KVs used in this chapter for the representative setting photographs are identified by their previous cKV designations and are shown in Figure B, along with the cKVs. Photographs taken from these representative KVs are presented in Figure C-1 through C-8. Then, 6 SKVs were selected for their ability to illustrate project impacts through simulations and are shown in Figure D.
- Assess visual compatibility and viewer sensitivity and analyze visual impacts with the aid of SKVs.
- Consider the regional visual context and the effect construction and facilities would have on the study area visual landscape.
- Provide methods to mitigate significant visual impacts.

The methods for evaluating aesthetic impacts include using existing data collection methods and sources provided for the project, an inventory of regional and local conditions, evaluation of the study area analytical context, and qualitative analysis techniques to determine how project activities and physical changes associated with the study area could cause impacts. The context and intensity of the impacts are also considered. This process, as well as a definition of impact severity, is discussed in detail below.

The affected environment was established based on clear-day and clear-night visibility to evaluate the most impactful scenario. The impact analysis follows this same approach.

C.2.1 Inventory Baseline Conditions/Environmental Setting

This analysis determines visual impacts by evaluating changes to the existing visual quality and predicting viewer sensitivity to those changes. As such, visual impacts are measured by the compatibility or incompatibility of the physical changes to the environment that are caused by a project's scale, form, and materials, which are seen by viewers, and the extent to which viewers care about—or how sensitive viewers are to—how a project changes the environment. Visual impacts can result in beneficial, adverse, or neutral changes to the visual environment and visual quality. Viewers have an inherent understanding of what constitutes project cohesion, which aids in determining the type of impact. The degree to which a project meets the preferred concept of project feature coherence determines the level of impact.

Neutral impacts reflect little change to the visual environment and visual quality, retaining the existing landscape composition and vividness. Beneficial impacts can result where visual quality is improved through the enhancement of aesthetic resources or where visual experiences are improved through the creation of new or improved views of resources. The level of beneficial impact is determined by how much a project improves the existing landscape composition and vividness and can range from small to substantial improvements. Adverse impacts can result when visual quality is degraded through visual resource modification or by blocking or altering views in a negative manner. The level of adverse impact is determined by how much a project degrades the visual landscape and ranges from general negative changes to severe declines in the existing landscape composition and vividness (Federal Highway Administration 2015:6-1–6-8).

The type and level of impacts will be evaluated in the EIR in accordance with Appendix G of the CEQA Guidelines.

C.2.2 Define the Visual Character of the Study Area

The environmental setting is comprised of the natural, cultural, and project environments that constitute the study area for a visual resource impact analysis; in the case of the proposed project. The terms *natural environment*, *built environment*, and *project site environment* are defined in the Initial Study. As described, there is overlap between the natural and built environments and the project environment; however, the project environment for any given project is composed of visible elements immediately within that project's boundaries and includes the existing development footprint, terrain and grading, constructed elements, vegetative cover, and other ancillary visual elements found within the project boundaries. The features that make up each environment specific to the project, as well as the elements and visual attributes typically associated with them, are described in more detail in Table C-1.

Often a proposed project is to be located on a site that is already developed. Therefore, the existing project feature coherence can be evaluated to establish existing, baseline conditions. For situations in which there is no existing development, the project would introduce a new development or create a new, natural or built element where none presently exists. In such cases, in lieu of describing the project environment, only the natural and built environment are described for existing conditions.

Table C-1. Visual Character Elements of Environmental Setting

Feature	Description of Element	Visual Attributes
Natural Environment		
Land	Landform and natural materials (besides water and vegetation) on the land (e.g., rocks, sand, boulders).	Landscape's form, its spatial qualities, and the nature of its materials.
Water	Flowing or impounded; natural or artificial.	Size of the waterbody, shape and spatial qualities of its perimeter, turbidity, the nature of its littoral or intertidal zones, and any other distinguishing visual attributes.
Vegetation	Presence or absence of vegetation; native, naturalized, or cultivated.	Height and density, artistic description (form, shading, color, and texture), and any other distinguishing visual attributes; seasonal changes (flowers, fruit, and seasonal color).
Animals	Wild or domesticated.	Domesticated farm animals in rural agriculture landscapes, wildlife as a visual indicator of a landscape's vitality and identity (e.g., whale or bird migrations, herds of large mammals, seasonal flocks of waterfowl).
Atmospheric Conditions	Temporal changes; presence or absence of humidity, fog, and dust that reduce or alter visibility.	Predictable amounts of precipitation, either as rain or snow, can change the visibility of the landscape. Rain, with its darkened sky, and snow covering the ground may change a landscape's *luminosity* (i.e., level of brightness) and key views and distance zones. Noting the frequency, even periodicity, of such obscuring or altering phenomena adds to the description of a landscape's visual character. For instance, the visual quality of the enclosing fogginess of the Arcata and Humboldt Bay Area is quite different from the open starkness of the very bright area of the Mojave Desert in Southern California.
Built Environment		
Buildings	Enclosed structures that are or have been used or occupied by people.	Buildings are often the dominant human-constructed objects in a landscape. A building's visual character is determined by its form, scale, massing, materials, and architectural style and detailing. Building orientation; patterns of light and shadow; artistic attributes like color, pattern, and texture; and site-specific setting, particularly if it obstructs views, all affect visual character. The building's historic status, current and past occupants, the architect who designed the building, the client for whom it was built, or the contractor who constructed it may also be critical to the perception of the building's visual quality. Views of a proposed project from a building are also important.
Infrastructure	Airports, harbors, roads, canals, dams, electrical and telecommunication utilities, pipelines, sewer and water systems, solar arrays, wind turbines, and other infrastructure.	A major visual attribute of infrastructure is linearity because infrastructure systems can stretch for miles, even across whole states. Extended lines can affect the character of the natural and built landscapes. Infrastructure also provides a special set of buildings, structures, and associated artifacts that are part of an intermodal system (for moving people, goods, and

Feature	Description of Element	Visual Attributes
		services) that can affect the visual character of a study area.
Structures	Engineered elements that provide a social function but are not buildings or part of a larger infrastructure system.	Structures may be walls, towers, and other constructed items erected to serve a single utilitarian function. Some structures have architectural treatments, but most do not, and form and materials are dictated by functional requirements. A structure's visual character is determined by its form, scale, massing, materials, construction method, and engineering detailing. Structure orientation; patterns of light and shadow; artistic attributes like color, pattern, and texture; and site-specific setting, particularly if it obstructs views, all affect visual character. The structure's historic status, the architect who designed the structure, the client for whom it was built, or the contractor who constructed it may also be critical to the perception of the structure's visual quality.
Artifacts and Art	Artifacts are those items that do not fit neatly into any other category, such as cultural aesthetic resources that are not buildings, infrastructure, or structures. Public art can also contribute to defining the visual landscape.	Artifacts and art are described in a manner similar to that recommended for buildings and structures.
Project Site Environment		
Grading	Existing grades associated with the project or the grading that will be necessary to accommodate a proposed project.	Grading creates physical forms that affect the visual character and quality of the landscape by altering existing landforms. This may include the presence of existing terrain and need to create or modify slopes, areas of cuts and fills, rock cuts, and retaining wall or gabion structures. The project environment is also affected by the surface appearance of rock cuts, retaining walls, and gabions.
Constructed Elements	Pavement and structures are often the most typical constructed elements associated with built features. Pavement that could affect visual character and quality include different types of paving used for road, shoulder, parking lots, sidewalks, and trails. Structures are major, necessary built components of the project such as buildings; bridges, viaducts, and culverts; retaining walls; noise barriers; and other large-scale visual elements.	Constructed elements are described in a manner similar to that recommended for the aesthetic resources associated with built environment. The descriptions for constructed elements can define the setting and orientation of the structures; their form, scale, massing, and material; aesthetic treatments like color, pattern, and texture; and may also describe the interplay between light and shadow. Description of a constructed element can also establish the site-specific setting if it obstructs or generates views, especially for buildings or elevated structures like bridges. The historic status and designer of a structure may also be critical in establishing its contribution to the visual character of the project area.

Feature	Description of Element	Visual Attributes
Vegetative Cover	Occurs within and outside of the footprint of constructed elements. Vegetation can occur along the outer edges of travel ways or within medians, interchange loops, or roundabouts. It can even be established to grow and cover constructed elements, such as noise barriers and retaining walls. The vegetation may be native, introduced, or feral.	Vegetative cover is often established for erosion control and can be also established to improve corridor aesthetics or to buffer undesirable views. Vegetative cover is described by identifying the density, distribution, and species composition. Aesthetic attributes of the plants such as seasonal color are also described. Vegetated rights-of-way are not present in all regions of the country, and vegetation may be minimal or even absent. However, the presence or absence of vegetation should still be described.
Ancillary Visual Elements	Generally, includes lighting, fencing, signage, and traffic control devices, such as traffic lights that enhance safety and direct circulation.	Existing and proposed lighting, fencing, signage, and traffic control elements are described to establish the existing and proposed visual character of the project.

Source: Federal Highway Administration 2015:5-1–5-5.

C.2.3 Select Key Views in the Study Area

To identify the potential impacts of alternatives on existing conditions of the visual environment, KVs where features could have visual effects were selected. The KVs selected were determined to be most representative of the potential for the project alternatives to change views available to sensitive receptors and from sensitive viewing areas.

KVs are derived and selected from cKVs. To determine cKVs, a 5-mile radius around aboveground project features was evaluated, which is the area that is considered to encompass discernible elements from the project alternatives that would be visible in the landscape. The mass and visibility of project features would be reduced to a less substantial portion of the total landscape at distances beyond 5 miles (i.e., background views).

A geographic information system (GIS)-based viewshed analysis was then conducted to identify areas from which the program and project have the potential to be seen. To conduct the viewshed analysis, points were assigned to the various features associated with the project. These points were assigned heights corresponding to the heights of features provided by the project designer. The viewshed analysis factors the surrounding terrain, but it does not factor vegetation or building heights. To be conservative, the viewshed analysis considers views up to 5 miles away from the project. Within this 5-mile radius, locations were then evaluated for their potential to have views of project features using the conceptual design plans overlain in Google Earth. These locations were views where shown to exist within the viewshed analysis were evaluated for their landform, vegetation, water, and artificial features. The cKVs were then chosen for the purposes of surveying the project features and surrounding areas. The following criteria were used to select the cKVs.

- Include at least one of a representative range of visible project features, including, for example, a fully constructed turbine, permanent or temporary cranes, access roads, docks, floating barges, the turbine holding area, warehouses and offices, along with all other visible project features such as material laydown areas, fencing, and project lighting.

- Include locations where project features would be visually obtrusive, including undeveloped areas that possess at least moderate scenic values.
- Include areas that would be particularly sensitive to changes in the visual landscape, including publicly accessible areas where viewers spend extended periods, historic resources are present, and areas that are at least moderately traveled by the public or are especially sensitive to new sources of light and glare.

In the field, these cKV locations were visited and photographed to document the presence or absence of views of the sites. Additional locations were also surveyed and photo documented by driving the roads surrounding the project alternatives and capturing the most descriptive views down the roadway corridors and toward the project site at intersections or where a safe road pull-out was present along longer or winding roadways with direct views toward the sites. These were often documented in a 180-degree (°) to 360° view to gain an understanding of available views from the perspective of both motorists and residents, where present, and to understand the visual setting.

Images from the cKVs were photographed using a greater than 10-megapixel digital single lens reflex camera equipped with a 50-millimeter equivalent focal length lens. This configuration is the de facto standard that approximates the average view cone and magnification of the human eye. The camera positioning was determined with a sub-meter differentially corrected global positioning system.

Within the study area, 137 cKVs were photographed during site visits occurring on April 26-27, 2022; June 16-19, 2022; September 4, 2022; and November 1, 2023, to understand existing visual conditions associated with the study area and critical viewpoints, referred to as key views (KVs) herein, which are seen by sensitive viewer groups including recreationists, roadway users, businesses, residences, and the Wiyot Tribe. However, the photographs were taken from public vantages only. From these cKVs, representative photos were selected to convey the existing visual character associated with the study area. The KVs are identified by their previous cKV designations; 16 KVs were selected for representative photographs.

An important consideration in KV selection was that visual impacts are generally based on public views (i.e., views from public roads, trails, towns, or bridges rather than from individual residences). However, views from individual private properties are also considered in evaluating overall change to the visual character of an area. For example, when a KV on the roadway is next to a residence or place of business, such as marinas and schools, that KV is evaluated as a residential or business viewer to ensure that those viewer groups were represented and assessed.

Another consideration in KV selection is that late fall through early spring views generally possess the greatest potential for visual impact because many trees and shrubs are dormant and without leaves that act to partially or fully screen project features in the landscape during the late spring to early fall. Vegetation's ability to screen features is dependent upon viewer location in relation to the structure and intervening vegetation and distance from both (i.e., a project feature will appear smaller if the viewer is farther away or larger if the viewer is closer to the structure).

KVs capture views from important, but discrete, locations; this makes them useful tools in evaluating potential impacts on key aesthetic resources in the impacts analysis. However, as they do cover only discrete locations, the impact analysis also factors in the larger regional context.

C.2.4 Determine the Visual Quality of the Study Area

C.2.4.1 Evaluation Methodology

Visual quality is affected by *aesthetics*—the study of pleasing perceptual experiences as seen by humans. These perceptions are remarkably consistent within a society and across cultures, even though an individual's experience of visual quality is unique because of previous life experiences. Visual quality is a function of what the viewer wants or expects to see and what is actually seen. If people see what they want or expect to see, then the visual quality is good or high because the viewer is pleased. However, if what is seen is lacking or not what is expected, then visual quality is poor or low because the viewer is disappointed. Expectations can be predictable for things like roadways and commercial development within a certain area. However, self-interest factors into visual preferences based on whether the viewer is a neighbor or user of a project feature and how they may be personally benefited or affected. Different viewers and viewer groups value aesthetic resources in different ways; therefore, there are different appraisals of visual quality. Regardless, there is a range of viewer responses inherent in all humans that aids in evaluating the overall landscape composition and vividness of both natural and built environments, which include: natural harmony, cultural order, project site coherence, and visual quality.

As visual quality is evaluated based on human perception, expectation, and preference, viewer preferences must be determined. Viewer preferences are established using a professional observational or public involvement approach. Professional observation is used on projects with average complexity and minimal controversy by identifying standard visual preferences associated with affected viewer groups that are adjusted to reflect state and local regulations protecting aesthetic resources. More complex and controversial projects often engage affected interested parties (i.e., neighbors and users) through public outreach and involvement to help define visual preferences.

C.2.4.2 Evaluation Rating

This analysis uses a descriptive means for rating and assessing impacts that is based on a numeric rating system. However, the numeric rating system was used to evaluate and rate SKVs. Numeric values are initially assigned to these descriptors that then determine the descriptive ratings. The numeric values range from 1 to 7 and correlate to descriptive ratings that range from very low to very high. While detailed, this rating system allows for a better means of determining the level of impact compared to a broader rating system of, for example, five rating levels. The numeric values and associated descriptive ratings are described in more detail in subsequent sections of this appendix. The rating forms used for the analysis are found at the end of this appendix.

Visual Resource Ratings

Aesthetic and visual resources are assessed by evaluating the visual character and visual quality of the resources that comprise the project environment before and after construction of a proposed project and how these changes affect the surrounding natural and built environments.

Natural harmony, cultural order, and project feature coherence are independent elements that contribute to the overall visual quality of a project's study area. The overall visual quality is evaluated to determine if the composition meets or does not meet visual preferences and expectations. To determine the overall visual quality, natural harmony, cultural order, and project

feature coherence are first assigned a numeric value that translates to a descriptive rating as shown in Figure C-7.

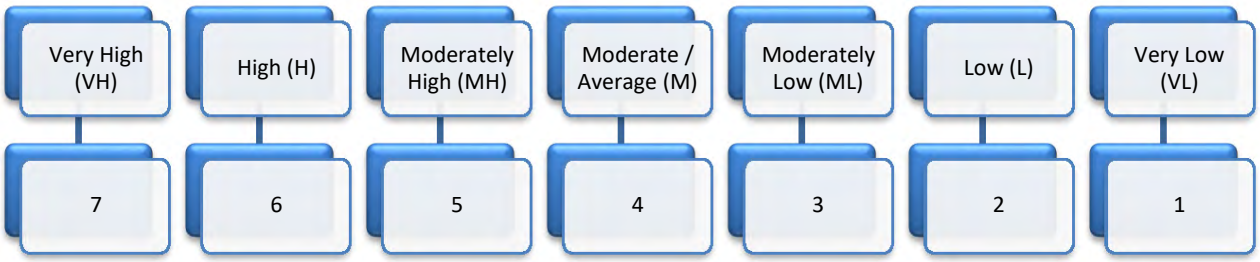


Figure C-7. Natural Harmony, Cultural Order, and Project Site Coherence Ratings

Table C-2 provides guidance on how to rate the natural harmony, cultural order, and project feature coherence. The overall visual quality is then calculated for existing and proposed conditions by averaging the natural harmony, cultural order, and project feature coherence ratings as follows.

$$Visual\ Quality = \frac{Natural\ Harmony\ Rating + Cultural\ Order\ Rating + Project\ Site\ Coherence\ Rating}{3}$$

The overall visual quality is then assigned a descriptive rating, called a *visual quality rating*, based on the numeric values as shown in Figure C-8.

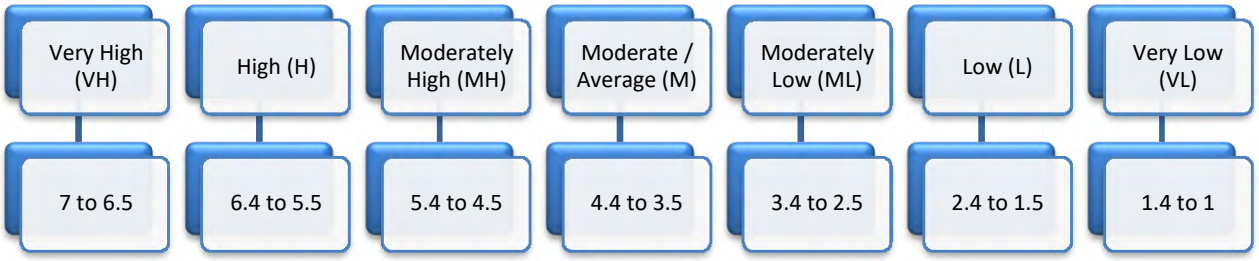


Figure C-8. Visual Quality Ratings

A very high rating corresponds to more pristine natural environments that are untouched by humans or cultural and project environments that are extremely well designed. As such, higher visual ratings represent landscape compositions that are vivid and that may evoke feelings of awe and wonderment. A very low rating corresponds to highly disjunct landscapes that have been haphazardly altered by humans. As such, lower visual quality ratings correspond to landscape compositions that may evoke negative emotional responses in viewers. In general, the more a composition meets visual preferences and expectations, the more positive the viewer response. In general, the more positive the viewer response is, the more memorable, or vivid, the composition becomes. For example, a more positive viewer response occurs when a development or roadway is not perceived as an intrusion but is seen as an integrated element belonging to a harmonious and orderly landscape.

Table C-2. Visual Resource Rating for Determining Visual Quality

Visual Resource	Visual Quality						
	Very High (7)	High (6)	Moderately High (5)	Moderate (4)	Moderately Low (3)	Low (2)	Very Low (1)
Natural Harmony	Landscape is pristine and untouched by human influences. Natural state is exemplary at a global level. Natural state may be very harmonious but may also be visually distinct in that the natural landscape inspires awe.	Landscape is largely untouched by natural and human influences. Natural state is exemplary to region and vicinity. Perceived as very harmonious.	Landscape has few visible modifications, but they do not greatly detract from available views. Natural state is of higher quality than natural environments that are more common to region and vicinity. Perceived as harmonious.	Natural landscape has visible natural and human modifications. Natural state is common to region and vicinity. Perceived as fairly harmonious with some slight distractions.	Landscape has notable visible modifications that detract from available views. Natural state is of lesser quality than natural environments that are more common to region and vicinity. Perceived as disharmonious.	Very disrupted natural landscape. Natural state may be perceived as an eyesore. Perceived as very discordant.	Natural landscape is in disarray and severely degraded.
Cultural Order	Built landscape is exceptional and can be perceived as having exceptional design cohesion recognized at a global level. Land uses may blend seamlessly but may also be visually distinct in that the built landscape inspires awe.	Built landscape is exemplary and can be perceived as having exemplary design cohesion compared to region and vicinity. Land uses blend seamlessly. Perceived as very orderly.	Built landscape is typical of the region and vicinity. Land uses blend well. Can be perceived as having superior design cohesion to ordinary or familiar built environment.	Built landscape contains orderly and familiar design elements typical of the region and vicinity. Land uses may be slightly disjointed. Can be perceived as an ordinary or familiar built environment.	Built landscape contains some unifying elements but generally lacks design cohesion. Perceived as containing highly disjointed land uses.	Built landscape lacks design cohesion and sense of place. May be perceived as blight.	Built landscape is in disarray and severely degraded.
Project Site Coherence	Project site blends with natural and built landscape to the degree that it cannot be noticed or can be perceived as providing an exceptional contribution to surrounding visual environments.	Project site is a part of the natural and built landscape and can be perceived as a beneficial, contributing visual element to surrounding environments.	Project site responds well to the natural and built landscape and can be perceived as being very compatible with surrounding environments.	Project site responds to the natural and built landscape in an adequate manner. Would require minor to moderate improvements for better compatibility with surrounding environments. Perceived as being common to the setting with some slight distractions.	Project site does not respond to the natural or built landscape and can be perceived as disjunctive. Would require moderate to substantial redesign to rectify compatibility with surrounding environments. Perceived as incoherent.	Project site substantially degrades the natural or built landscape. Would require substantial to major redesign or relocation to rectify compatibility with surrounding environments. Perceived as very incoherent.	Project site is in disarray and severely degrades the natural or built landscape. Would require major redesign or relocation to rectify compatibility with surrounding environments.
Visual Quality [a]	$\frac{\text{Natural Harmony Rating + Cultural Order Rating + Project Site Coherence Rating}}{3}$						

[a] The combined evaluation of visual quality and memorability of natural harmony, cultural order, and project coherence. Translate the numeric calculation to the descriptive rating.

Light and Glare Ratings

Natural and artificial light, atmospheric conditions, regional weather patterns, vegetation, terrain, water features, built structures, materials, and surface texture and color within the natural, cultural, and project environments all contribute to light and glare. While light and glare are a part of the natural, cultural, and project environments, changes in light and glare are often assessed independently and in a qualitative manner that compares existing to proposed changes in *levels* of light and glare. These assessments also include evaluating changes to shade and shadowing that can, in turn, affect levels of light and glare.

Within the study area, light and glare levels are assessed by evaluating existing and resultant light and glare levels associated with a project feature and the surrounding project vicinity. This helps to determine the changes in light and glare levels, specifically, at a project site. This also helps to determine if, for example, vegetation removal or light fixture installation at a project feature would result in an increase in light and glare levels on adjacent properties in the project vicinity, or, perhaps, if built structures or landscaping would introduce shade or filter project lighting and result in a decrease in light and glare levels on adjacent properties in the project vicinity. Rating light and glare levels in this manner helps to frame the impact discussion in this Initial Study and aids in determining how the overall light and glare levels are changed within the study area and the source and location of such changes. The levels of daytime and nighttime light and glare are rated as shown in Figure C-9.

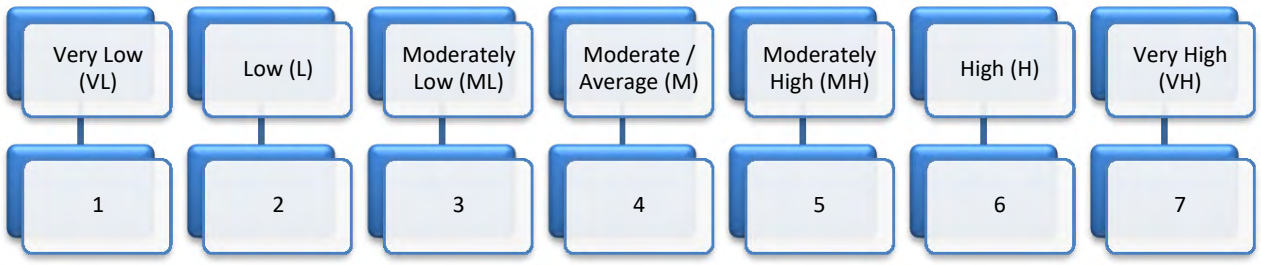


Figure C-9. Daytime and Nighttime Light and Glare Level Ratings

While the visual resource rating is a measurement of *quality*, the light and glare ratings are a measurement of *intensity* to assess degree of change and are not intended to imply judgment of good vs. bad.

In general, a project's analysis would rate existing light and glare levels for both daytime and nighttime conditions. However, proposed light and glare levels may not need to be rated when no changes are proposed that would affect either daytime or nighttime conditions. This would occur, for example, when existing nighttime lighting would not be modified, and no new lighting would be introduced as a result of a proposed project. Therefore, there would be no change between the existing and proposed conditions. In addition, the level of light and the level of glare can be rated together or independently of one another, depending on project circumstances. Independent ratings for light and glare levels may benefit more complex projects because using independent ratings would make the impact discussion and assessment easier to frame and evaluate.

Unlike the visual resource ratings described under *Visual Resource Ratings*, the ratings for light and glare levels are not averaged together because doing so could skew light and glare impacts, as illustrated in Table C-3. For Table C-3, the existing condition of the project site is undeveloped, evergreen, forested lands and the project vicinity is forested in the same manner. Therefore, the existing conditions for both the project site and project vicinity would result in a very low light and glare rating. In this example, the project is a multi-lane freeway that would be well-lit and have a moderately high light and glare rating. Light from the project would increase the amount of light and glare at the project site and would result in light spill onto the adjacent forest in the project vicinity. However, the tall evergreen trees would limit the amount of spill. As shown in the *Average Level of Increase* row in Table C-3, averaging the ratings of the project site and project vicinity provides a generalized level of increase for the whole study area but does not account for the higher levels of increase that would be experienced at the project site and elevates the level of increase affecting the project vicinity. In this example, the analysis would reasonably conclude that light and glare would be increased at the project site, but the tall evergreen trees limit light spill to a small area outside of the right-of-way.

Table C-3. Changes to Nighttime Light and Glare—Evergreen Forest

Light and Glare Rating	Proposed	Existing	Additive Level of Increase	Notes
Project site	5 (moderately high)	1 (very low)	5-1 = 4 levels of increase at the project site	Recommended Calculation Method
Project vicinity	2 (low)	1 (very low)	2-1 = 1 levels of increase within the project vicinity	Recommended Calculation Method
Averaged level of increase	(5+2)/2 = 3.5	(1+1)/2 = 1	3-1 = 2 levels of increase within the study area	Discouraged Calculation Method

Table C-4 provides a general guide to assessing and rating *daytime* light and glare levels. Table C-5 provides a general guide to assessing and rating *nighttime* light and glare levels. As shown in these tables, project site and project vicinity light and glare levels are evaluated using the same parameters. Table C-5 focuses primarily on artificial lighting levels.

Table C-4. Daytime Light and Glare Levels [a]

Location	Daytime Light and Glare						
	Very Low (1)	Low (2)	Moderately Low (3)	Moderate (4)	Moderately High (5)	High (6)	Very High (7)
Project Vicinity and Project Site [b]	**Natural Environment:** Very densely vegetated and heavy shading or shadowing that may result from vegetation, landforms, or natural materials that create an enclosed effect. May be typically overcast, dull, or rainy weather conditions. May be perceived as dark and muted. Details may be hard to see due to heavy shade and shadowing combined with low lighting levels and darker colored natural features. Smaller waterbodies may be present. **Built Environment:** Landscape has barely perceptible or no cultural elements that contribute to daytime light and glare. This may be typical of natural areas that have very limited human influence.	**Natural Environment:** Densely vegetated and moderate to heavy shading or shadowing that may result from vegetation, landforms, or natural materials that create a canopy effect. Understories and ground planes may be dappled with sunlight in sunny conditions or understories can be seen as grayish, foggy, or muted in overcast and rainy conditions. Details may be slightly hard to see due to heavy shade and shadowing combined with low lighting levels and darker colored natural features. Smaller waterbodies may be present. **Built Environment:** Landscape has very few cultural elements that contribute to daytime light and glare. This may be typical of natural areas or very low density forested or rural areas.	**Natural Environment:** Moderate to dense vegetative cover with typically bright, sunny weather conditions so that vegetation's shade and shadowing helps filter sunlight, offsetting the effects of light and glare. Smaller to medium-sized waterbodies may be present. Or, little vegetation in a typically overcast, dull, or rainy environment where lack of sunshine offsets effects of little vegetative cover. Smaller to large sized waterbodies may be present. **Built Environment:** Landscape has few cultural elements that contribute to daytime light and glare. This may be typical of areas with low density development, such as in rural areas.	**Natural Environment:** Moderate mix of vegetation and open spaces that provides a balance between light and glare in a range from dull to bright environments. Smaller to medium-sized waterbodies may be present. **Built Environment:** Landscape is moderately developed with cultural elements that contribute to daytime light and glare. This may be typical of areas with higher density rural development or lower to medium density suburban development.	**Natural Environment:** More open mix of vegetation and open spaces that does not quite offset or balance the effects of light and glare in a range from dull to bright environments. Medium to larger waterbodies may be present. **Built Environment:** Landscape is quite developed with suburban or urban development that contribute to daytime light and glare. This may be typical of highly suburbanized areas; lower density urban areas; or business, commercial, and industrial areas that have a higher ratio of impervious paving and build structures.	**Natural Environment:** Little vegetative or landform cover with typically bright, sunny weather conditions and large bodies of water or lightly colored expanses of natural surfaces (e.g., snow cover, desert sands) other naturally reflective surfaces tend to be present. May be perceived as glaringly bright and cause visual discomfort. Details may be hard to see without protective eyewear. **Built Environment:** Landscape tends to be highly developed with urban uses with many reflective surfaces such as high-rise buildings with many windows.	**Natural Environment:** No vegetative or landform cover with typically bright, sunny weather conditions and large bodies of water or lightly colored expanses of natural surfaces (e.g., snow cover, desert sands) other naturally reflective surfaces tend to be present. May be perceived as glaringly bright and cause visual discomfort. Details may be hard to see without protective eyewear. **Built Environment:** Landscape tends to be very highly developed urban environments with a substantial number of reflective surfaces such as glass-faced high-rise buildings. In such instances, levels of daytime light and glare may be highly dependent on time of day (i.e., sun angle) and viewer position in the landscape (i.e., ground-level views in a city may be shaded where views from different building levels are not).
Light and Glare (L&G) Level Increase	Proposed Project Vicinity L&G Levels – Existing Project Vicinity L&G Levels = Change in L&G Levels [c]	AND	Proposed Project Site L&G Levels – Existing Project Site L&G Levels = Change in L&G Levels [c]				

[a] The level of light and the level of glare can be rated together or independently of one another, depending on the project's needs (refer to *Light and Glare Ratings*).

[b] Project site and project vicinity light and glare levels are evaluated using the same parameters.

[c] A positive number means an increase in light and glare levels. A negative number means a decrease in light and glare levels. Translate the numeric calculation to the descriptive light and glare rating.

Table C-5. Nighttime Light and Glare Levels [a]

Visual Resource	Nighttime Light and Glare						
	Very Low (1)	Low (2)	Moderately Low (3)	Moderate (4)	Moderately High (5)	High (6)	Very High (7)
Project Vicinity and Project Site [b]	**Natural Environment:** High cloud cover or haze caused by natural conditions or atmospheric pollution. Tends to have extensive overhead cover present. Conditions allow for very low levels of nighttime lighting from the stars and moon. Colors and details cannot be seen at night. **Built Environment:** Landscape has barely perceptible or no cultural elements that contribute to nighttime light and glare because of very limited human influence. No traditional interior or exterior lighting is present. Colors and details cannot be seen at night without artificial lighting (e.g., from vehicle headlights).	**Natural Environment:** Moderate cloud cover or haze caused by natural conditions or atmospheric pollution. Tends to have overhead cover present. Conditions allow for low levels of nighttime lighting from the stars and moon. Colors and details are very hard to see at night. **Built Environment:** Landscape has very few cultural elements that contribute to nighttime light and glare. This may be typical of natural areas or very low density forested or rural areas. Very low levels of interior and exterior lighting are present. Colors and details are very hard to see at night without artificial lighting (e.g., from vehicle headlights).	**Natural Environment:** Slight cloud cover and haze, natural or otherwise, occurs on a regular basis. Moderate to little overhead cover. Conditions allow for some nighttime lighting from the stars and moon. Colors and details begin to become more visible at night. **Built Environment:** Very low levels of exterior lighting in developed areas or landscape has low density development, such as in rural areas, with limited amounts of interior and exterior nighttime lighting from buildings, vehicles, streets, etc. that provide low levels of lighting to the area and reflects off of the built environment to a small degree. Colors and details begin to become more visible at night with artificial lighting (e.g., from vehicle headlights).	**Natural Environment:** Cloud cover and haze, natural or otherwise, varies. Moderate to little overhead cover. Conditions allow for moderate levels of nighttime lighting from the stars and moon. Colors and details can be seen night to varying degrees of clarity based on level of detail and brightness of colors. **Built Environment:** Moderate amounts of interior and exterior nighttime lighting, such as in higher density rural development or lower to medium density development suburban areas, from buildings vehicles, streets, etc. that provide fairly well-lit conditions that reflects off of the built environment to a small degree. Traditional outdoor lighting may be intermixed independent sources of higher intensity lighting that causes small patches of "daytime" lighting conditions at night. Visual discomfort in close proximity to pockets of highly lit areas. Colors and details can be seen at night to varying degrees of clarity based on level of detail and brightness of colors. Colors and details are enhanced with the addition of artificial lighting (e.g., from vehicle headlights). Higher intensity lighting may be present at some locations.	**Natural Environment:** Cloud cover and haze, natural or otherwise, is rare. Sparse overhead cover. Conditions allow for nighttime lighting from the stars and moon. Colors and details are fairly visible at night. **Built Environment:** Substantial amount interior and exterior nighttime lighting, such as in suburban or urban development, from buildings, vehicles, streets, etc. to brighten the area and reflects off of the built environment. Higher intensity lighting begins to outweigh traditional outdoor lighting and causes small islands "daytime" lighting conditions at night. Nighttime lighting may cause visual discomfort across portions of the area. Lighting may lack proper shielding. Colors and details are fairly visible at night.	**Natural Environment:** Typically, no cloud cover or haze caused by natural conditions or atmospheric pollution. Sparse overhead cover. Tends to have large waterbodies or extensive snow cover present. Conditions allow for high levels of nighttime lighting from the stars and moon. Colors and details are easy to see at night. **Built Environment:** Landscape tends to be highly developed with urban uses with a substantial amount interior and exterior nighttime lighting from buildings, vehicles, streets, billboard, stadiums, etc. to illuminate the area and reflect off of the built environment. Lighting of greater intensity is highly used and causes larger islands of "daytime" lighting conditions at night. Nighttime lighting causes visual discomfort across much of the area. Lighting may lack proper shielding. Colors and details are very easy to see at night.	**Natural Environment:** Typically, no cloud cover or haze caused by natural conditions or atmospheric pollution. No overhead cover. Tends to have large waterbodies or extensive snow cover present. Conditions allow for high levels of nighttime lighting from the stars and moon. Colors and details are very easy to see at night. **Built Environment:** Landscape tends to be very highly developed urban environments with a great deal of interior and exterior nighttime lighting from buildings, vehicles, streets, billboard, stadiums, etc. to illuminate the area and reflect off of the built environment. Higher intensity lighting is prominent and causes expanses of "daytime" lighting conditions at night. Nighttime lighting causes visual discomfort across a large area. Lighting may lack proper shielding. Colors and details are very similar to daytime conditions.
Light and Glare (L&G) Level Increase	Proposed Project Vicinity L&G Levels – Existing Project Vicinity L&G Levels = Change in L&G Levels [c]			AND	Proposed Project Site L&G Levels – Existing Project Site L&G Levels = Change in L&G Levels [c]		

[a] The level of light and the level of glare can be rated together or independently of one another, depending on the project's needs (refer to *Light and Glare Ratings*). Refer to Table 3.1-4 for descriptions to help determine the presence of features that may affect nighttime glare.
[b] Project site and project vicinity light and glare levels are evaluated using the same parameters.
[c] A positive number means an increase in light and glare levels. A negative number means a decrease in light and glare levels. Translate the numeric calculation to the descriptive light and glare rating.

In Table C-6, the existing conditions of the project site and project vicinity are both undeveloped, oak woodlands that result in a low light and glare rating. The Table C-6 project is the same as the Table C-3 project, and light from the project site would spill onto the adjacent oak woodlands in the project vicinity. Like Table C-3, averaging the ratings of the project site and project vicinity in Table C-6 also provides a generalized level of increase for the whole study area but does not account for the higher levels of increase that would be experienced at the project site, and it elevates the level of increase affecting the project vicinity. In this example, the visual resource specialist would explain how the more open oak woodlands are naturally brighter at night but how sparser vegetation densities in the project vicinity would not block as much proposed light that would trespass from the project site. This would allow project lighting to spill a greater distance away from the project site boundaries and farther into the project vicinity.

Table C-6. Changes to Nighttime Light and Glare—Oak Woodlands

Light and Glare Rating	Proposed	Existing	Additive Level of Increase	Notes
Project site	5 (moderately high)	2 (low)	5-2 = 3 levels of increase at the project site	Recommended Calculation Method
Project vicinity	4 (moderate)	2 (low)	4-2 = 2 level of increase within the project vicinity	Recommended Calculation Method
Averaged level of increase	(5+4)/2 = 4.5	(2+2)/2 = 2	4.5-2 = 2.5 levels of increase within the study area	Discouraged Calculation Method

In these examples, the level of increase provides information on describing the change in light and glare levels. However, light and glare impacts must be factored with viewer response and the type of change that would result from the project. For example, a roadway project that would cut through evergreen forests or oak woodlands, as proposed in Tables B-6 and B-9, may not have many viewers that would be directly affected. However, these natural areas could be of local or regional importance and introducing sources of nighttime lighting would not be viewed as favorable. Conversely, an increase in light and glare may not be considered to be negative, depending on the project. For example, light and glare could increase within an evergreen forest or oak woodland if invasive vegetation would be removed, allowing natural recruitment of native plant species, which is likely to be viewed as favorable. Therefore, the analysis must determine the change in light and glare levels; evaluate affected viewers, viewer sensitivity, and viewer preferences; assess the proposed project actions; and determine if changes in light and glare are negligible, positive, or negative and if any mitigation is needed to reduce impacts.

In addition, when evaluating light and glare levels, atypical conditions may exist that require deviation from the guidance provided in Tables B-7 and B-8. For example, a suburban area with neutral-colored buildings that is moderately developed, with tree cover present, may be considered to have moderate levels of light and glare. However, if that same area was to be developed with all white buildings (e.g., due to historical preservation or local design standards) then the level of glare might be considered to be moderately high because the white building surfaces are more reflective and create a higher degree of perceived glare.

C.2.5 Analyzing Visual Impacts

C.2.5.1 Assess Visual Compatibility

A project environment can be affected by the visual character of grading, constructed elements, vegetative cover, infrastructure, and other ancillary visual elements associated with a project that interact to form a composition. These elements are described in more detail in Table C-7. These changes affect the natural and built environments in the study area, and viewers evaluate project features to determine if the composition of the landscape during and after project construction is compatible or incompatible with the existing visual landscape. This viewer response determines how the existing landscape composition and vividness would be affected by a proposed project.

Table C-7. Visual Character Element of a Project Environment

Feature	Description of Element	Visual Attributes
Grading	Alteration of the existing landform, or the grading, required to accommodate the project.	The visual character of the physical forms generated by grading, such as grading of slopes, the need for cuts and fills, and the presence of rock cuts and retaining walls, all affect visual quality. The surface appearance of rock cuts and retaining walls also affects the visual character of the project area.
Constructed Elements	Buildings, infrastructure, and structures resulting from project implementation. Buildings can include homes, businesses, institutions, and so on. Infrastructure can include new roads, parking lots, sidewalks, trails, utility lines, and telecommunication towers. Structures can include bridges, viaducts, culverts, retaining walls, noise walls, and other large-scale visual elements.	The visual character of constructed elements is described in terms of their form, scale, massing, and material compared to the existing built and natural environment. The setting and orientation of the structures, interplay between light and shadow, and artistic attributes like color, pattern, and texture also affect visual character. Whether a feature obstructs or generates views is also important.
Vegetative Cover	Vegetation associated with the project, such as hydroseeding for erosion control, plantings for habitat enhancement or restoration, and landscaping for aesthetics and shade. Also, vegetative cover may be removed by project activities.	The visual character of the project's vegetative cover; its density, distribution, and species composition compared to the existing natural environment. Attributes of the plants (such as seasonal color) and the ecological setting are also important.
Ancillary Visual Elements	May include signage, mailboxes, benches, fencing and gates, bollards, plant containers, or other features.	Such features contribute to the project's appearance as components of the project's visual character, and existing and proposed elements are described in relation to each other.

Source: Federal Highway Administration 2015:5-1–5-4.

C.2.5.2 Evaluate Viewer Response

Viewers make up the population affected by a project; they are the people whose views of the landscape may be altered by a proposed project, either because the landscape itself has changed or their perception of the landscape has changed. Viewers experience the visual landscape and respond to the natural and built environment and the design of built features in those environments.

There are two major types of viewer groups for projects*: site neighbors* and *site users*. Each viewer group has their own particular level of *viewer exposure* and *viewer sensitivity*, resulting in distinct and predictable visual concerns for each group that help to predict their responses to visual changes.

Table C-8 describes the five levels used for determining viewer response, which is in part affected by distance zones. Evaluating visual quality and viewer response must also be based on a regional frame of reference (U.S. Soil Conservation Service 1978:3). The same visual resource appearing in different geographic areas could have a different degree of visual quality and associated viewer sensitivity in each setting. For example, a small hill may be a significant visual element on a flat landscape but have little significance in mountainous terrain.

Table C-8. Viewer Response Ratings

Response Ratings	Response Descriptions
Very low (VL)	A very small fraction of total viewers [a] with instantaneous (e.g., highway speeds) views toward project feature. Views of the project feature tend to be in the middleground or background or are highly obscured in the foreground. Negligible interest in the visual landscape.
Low (L)	Very few of total viewers [a] with instantaneous (e.g., highway speeds) views toward project feature. Views of the project feature tend to be in the middleground or background. Little interest in the visual landscape.
Moderately low (ML)	Few of total viewers [a] with short (e.g., local roadway speeds) views toward project feature in the middleground or background. May include fewer viewers with instantaneous views of the project in the foreground. Limited interest in the visual landscape.
Moderate (M)	A number of the total viewers [a] with intermittent (e.g., visitors at parks) views toward project feature in the foreground. May include fewer viewers with shorter viewing times of the project in the foreground. May also include viewers with extended (e.g., places of businesses) or permanent (e.g., residents) viewing times of the project in the distant middleground to closer background toward areas with high community interest. General interest in the visual landscape.
Moderately high (MH)	Many of total viewers [a] with extended viewing times (e.g., places of businesses) toward project feature in the foreground or middleground. May include fewer viewers with shorter viewing times toward areas with high community interest in the foreground or middleground. May also include fewer viewers with shorter viewing times toward sensitive visual resource(s) in the distant middleground to closer background. Invested interest in the visual landscape.
High (H)	Most or all of total viewers [a] with permanent (e.g., residents) views toward project feature in the foreground or middleground. May include fewer viewers with shorter viewing times toward sensitive visual resource(s) in the foreground or middleground. Highly invested interest in the visual landscape.
Very high (VH)	May include a variety of viewers with permanent (e.g., residents) or intermittent (e.g., recreationists/tourists) views toward sensitive visual resource(s) of local, national, or global interest. Extremely high invested interest in the visual landscape, due to public awareness of the resource.

[a] Relative to total number of viewers of the project in the study area.

C.2.5.3 Determine Visual Impact Values

Ratings are used to help determine the level of impact for changes to the existing visual character and quality (Impact AES-1) and to scenic highways (Impact AES-2) within the study area. This rating system has been developed independently of, but using the methods and protocol contained in, FHWA's *Guidelines for the Visual Impact Assessment of Highway Projects* (Federal Highway Administration 2015). The rating system uses the following steps.

1. Determine the existing and proposed *visual quality* for aesthetic resources.
2. Assess the visual resource impact.
    a. Determine the compatibility of the project's changes.
    b. Determine *viewer response rating* for near-term improvements.
    c. Determine the *degree of impact*.

In addition, ratings are used to help determine the level of impact resulting from changes to light and glare (Impact AES-3) using the following steps.

1. Determine the light and glare levels for existing conditions.
    a. Determine the *daytime light and glare level* for existing conditions using Table C-4.
    b. Determine the *nighttime light and glare level* for existing conditions using Table C-5.
2. Determine the light and glare levels for project conditions.
    a. Determine the *daytime light and glare level* for project conditions using Table C-4.
    b. Determine the *nighttime light and glare level* for project conditions using Table C-5.
3. Determine if there is a change in the daytime light and glare rating and nighttime light and glare rating.
4. Evaluate the *viewer response rating* for near-term improvements using Table C-8, as determined for Impacts AES-1 and AES-2, and factor if the change in light and glare levels from project actions are positive or negative.
5. Determine the level of light and glare impact using Table C-10.

Visual Resource Impacts

Viewers have an inherent understanding of visual quality and what constitutes natural harmony, cultural order, and project cohesion. The degree to which a project meets these preferred concepts determines the level of change in visual quality. To assess the degree and level of impacts on aesthetic resources, a visual quality rating is applied to both existing and proposed project conditions. The degree of change from the existing (without project) visual quality to the visual quality with the project is used to determine the level, or intensity, of visual impacts. Impacts are described in this Initial Study as *no impact*, *less than significant*, and *significant.* These impact intensities are defined as follows and are summarized in Table C-9.

- *No impact* on aesthetic and visual resources would result when the project features do not modify the existing visual quality. There would be no construction- or operation-related changes upon a location. In addition, there would be *no impact* when visual quality is improved through the enhancement of aesthetic resources or when visual experiences are improved through the

creation of new or improved views of resources. Beneficial impacts increase the visual quality and viewers are not affected by or see the benefits of the change (i.e., proposed visual quality > existing visual quality).

- *Less-than-significant* impacts related to aesthetic and visual resources are direct or indirect impacts that would reflect little change to the visual environment and visual quality, largely retaining the existing landscape composition and vividness or modifications are in keeping with the existing landscape composition and vividness and the visual quality stays essentially the same or the visual quality is not affected to the degree that the visual quality is substantially degraded and viewers groups are not negatively affected by the changes (i.e., proposed visual quality = existing visual quality).
- *Significant* impacts would result when visual quality is degraded through general negative changes to aesthetic resources or by blocking or altering views in a negative manner, decreasing the visual quality and negatively affecting viewer groups (i.e., proposed visual quality < existing visual quality). Decreasing visual quality by one value rating is an impact of moderate intensity, whereas decreasing visual quality by more than one value constitutes a more severe impact.

Table C-9. Level of Visual Resource Impact—CEQA

Impact Intensity Visual Quality Effect	Visual Quality Rating Change
No Impact	
No project features	Not applicable
Proposed Visual Quality > Existing Visual Quality	Visual quality is increased by one or more value ratings (i.e., a beneficial change)
Less than Significant	
Proposed Visual Quality = Existing Visual Quality	Visual quality remains the same
Significant (Moderate)	
Proposed Visual Quality < Existing Visual Quality	Visual quality is decreased by one value rating
Significant (More Severe)	
Proposed Visual Quality < Existing Visual Quality	Visual quality is decreased by more than one value rating

Light and Glare Impacts

Light and glare impacts are determined by assessing the change in light and glare levels; evaluating affected viewers, viewer sensitivity, and viewer preferences; factoring in the proposed project changes; and determining if changes in light and glare are negligible, positive, or negative and if any mitigation is needed to reduce impacts. Light and glare impacts are described in this Initial Study as *no impact*, *less than significant*, and *significant.* These impact intensities are defined as follows and are summarized in Table C-10.

- *No impact* on light and glare would result when the project features do not modify the existing levels of light and glare because there would be no construction- or operation-related changes upon a location. In addition, there would be *no impact* when changes in light and glare levels result in improved light and glare conditions and result in a positive viewer response by either decreasing light and glare in areas with too much light and glare (proposed light and glare rating

< existing light and glare rating) or increasing light and glare to restore natural areas or brighten unnaturally dark conditions (proposed light and glare rating > existing light and glare rating).

- *Less-than-significant* impacts would result when there is little change, and light and glare levels remain essentially the same or would not change enough to result in a notable change in light and glare levels, resulting in a neutral viewer response (proposed light and glare rating = existing light and glare rating).
- *Significant* impacts would result when changes in light and glare levels result in degraded light and glare conditions and result in a negative viewer response by either decreasing light and glare in areas that are perceived as already having too little or sufficient lighting (proposed light and glare rating < existing light and glare rating) or increasing light and glare in areas that are perceived as already having sufficient or too much light or glare (proposed light and glare rating > existing light and glare rating). Substantially increasing or decreasing light and glare levels would heighten viewer response and result in more severe impacts.

Table C-10. Level of Light and Glare Impact—CEQA

Impact Intensity Light and Glare Rating (LGR)—Effect	Light and Glare Rating (LGR)—Rating Change
No Impact	
No project features	Not applicable
Proposed LGR < Existing LGR	LGR is decreased in areas with too much light and glare (i.e., a beneficial change)
Proposed LGR > Existing LGR	LGR is increased, but project is restoring natural areas or unnaturally dark conditions (i.e., a beneficial change)
Less than Significant	
Proposed LGR = Existing LGR	LGR remains the same
Significant (Moderate)	
Proposed LGR < Existing LGR	LGR is decreased in areas that are perceived as already having too little or enough light or glare
Proposed LGR > Existing LGR	LGR is increased in areas that are perceived as already having enough or too much light or glare
Significant (More Severe)	
Proposed LGR < Existing LGR	LGR is substantially decreased in areas that are perceived as already having too little or enough light or glare
Proposed LGR > Existing LGR	LGR is substantially increased in areas that are perceived as already having enough or too much light or glare

C.3 References Cited

Federal Highway Administration. 2015. *Guidelines for the Visual Impact Assessment of Highway Projects*. Document FHWA-HEP-15-029. January. Washington, DC. Prepared by ICF International, Inc.