4. Alternatives Description and Analysis

4.1 Introduction

This chapter presents the alternatives analysis for the Project. Section 15126.6(a) of the CEQA Guidelines requires an Environmental Impact Report (EIR) to "describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives." An EIR need not consider every conceivable alternative to a project. Rather, it must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation. An EIR is not required to consider alternatives that are infeasible. The lead agency is responsible for selecting a range of project alternatives for examination in addition to the proposed project and must publicly disclose its reasoning for selecting those alternatives. This Chapter of the CEQA Guidelines also describes the purpose of considering alternatives (Section 15126.6[b]) as a way to identify any measures that would mitigate or avoid the significant effects that a project may have on the environment (Public Resources Code (PRC) Section 21002.1).

The CEQA Guidelines further require that the alternatives be compared to the proposed Project's environmental impacts and that a "no project" alternative be considered (Section 15126.6[d] and [e]). CEQA Guidelines Section 15126.6(e)(1) states that the purpose of describing and analyzing the no project alternative is "to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project." The no project analysis is required to "discuss the existing conditions at the time the notice of preparation is published…as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services" (Section 15126.6[e][2]). If the project is a "development project on identifiable property," the "no project" alternative is the circumstance under which the project does not proceed. Here the discussion would compare the environmental effects of the property remaining in its existing state against environmental effects which would occur if the Project were approved. In certain instances, the no project alternative (Alternative 1) and the off-site alternative (Alternative 2) means "no build" wherein the existing environmental setting is maintained (e.g., legacy industrial infrastructure and remaining contamination from the pulp mill would remain).

4.1.1 Identifying Project Alternatives

A Notice of Preparation (NOP) was circulated for the Project on June 3, 2021, describing the proposed Project. During the scoping period, the County of Humboldt (County) received comments expressing concerns related to energy usage, effluent discharge and related monitoring, transportation and traffic, alternative fish species, and potential biological impacts related to the water intake. Please see Appendix M for a summary of all comments received during the scoping period. Where feasible, Project alternatives and related impact analyses have been explored to offset these concerns.

The alternatives to the Project analyzed in this chapter include the No Project Alternative, an Off-Site Alternative, and a Species/Water Supply Alternative. The environmentally superior alternative is described in Section 4.4, and alternatives which were considered but are not being carried further in this Draft EIR are described in Section 4.2 below. Resource categories identified as having no impacts under the Project (see Chapter 5 – Other CEQA Sections) are not discussed in the Alternatives Analysis.

4.2 Alternatives Considered but not Carried Forward in this Draft EIR

4.2.1 Nordic Aquafarms' Pre-Siting West Coast Search

Prior to deciding to locate the proposed facility on the Samoa Peninsula, NAFC conducted a west coast search that evaluated potential site locations in Washington, Oregon, and California. Site selection was based on the criteria shown in Table 4-1 – Site Selection Criteria. The search started with twelve west coast communities, including the Samoa Peninsula. The list of twelve communities was narrowed to three potential locations, which went through a more thorough assessment. Of the identified potential site locations on the west coast, the proposed site location on the Samoa Peninsula was identified and ranked the highest against the site selection criteria applied by NAFC.

Table 4-1 Site Selection Criteria

Logistical Requirements	Operational Criteria	Regulatory Criteria	Community Features
Seawater source within 1,500 meters	Three-phase power supply	Economic Opportunity Zone	Labor force/local college; supportive of development projects
Clean freshwater sources at 1,600 gallons/minute	Marine, ground, and air transportation	No related impairments in receiving waters	Livable community
Deepwater discharge location	Stable, appropriate water temperature	Compatible zoning	Maritime and fisheries culture

The proposed Samoa Peninsula location was determined to be the best location for the facility, as it was sufficient in size and met the required seawater and deep water discharge. Required freshwater was similarly available via the Humboldt Bay Municipal Water District. The Samoa Peninsula location also met the operational, regulatory, and community criteria used during the broader west coast site selection process.

4.2.2 Humboldt County's Alternative Sites Analysis

In October 2020, the County completed an Alternative Sites Analysis as required by Humboldt County Code and the Humboldt Bay Area Plan (incorporating Section 30260 of the Coastal Act), which requires new industrial development to be sited in the least environmentally damaging location. While the Alternative Sites Analysis was explicitly distinct from the alternatives analysis required under CEQA, the process included outreach to jurisdictional agencies requesting input for alternative Priority 2 site locations (Humboldt County 2020). The purpose of the analysis was to evaluate potential industrial sites in the Humboldt Bay Area that could support the Project, based on the following criteria:

- 30-40 acre (12-16 hectares) site located no more than approximately 1500 meters from the shoreline
- Access to clean freshwater resources (minimum of 6,100 liters/minute)
- Groundwater of relatively low solute content is preferred, but access to a reliable clean surface water source (e.g., river water) may be acceptable
- Access to clean, cold seawater
- Potential for deep-water ocean discharge of treated wastewater (well-mixed)
- Conditions along the coast capable of supporting commercial shipping of fish products
- Access to a considerable 3-phase power supply in the area
- Compatible Zoning
- Moderate ground elevation differences from ocean to site, and on the site itself
- Reliable and modern road transportation and/or commercial vessel access from the facility to product distribution hubs and consumer markets

– Reliable and modem road network capable of supporting the needs of the facility, including heavy equipment during construction

Priority Site 2 Letters seeking alternative site location proposals for the Project were sent to the following agencies in November 2020: California Coastal Commission (CCC), Humboldt Bay Harbor Recreation and Conservation District (Harbor District), U.S. Army Corps of Engineers (USACE), and the Humboldt County Planning and Building Department, Long Range Planning Division. The USACE did not have any site recommendations, given no part of the aquaculture facility will be developed within the Corps' jurisdiction. Additionally, as the facility would not result in the placement of fill in any jurisdictional areas, the Corps would not issue a permit for this project. Coastal Commission – North Coast District staff responded stating the CCC staff had no issue with proposed use at the selected site (Humboldt County 2020).

Humboldt County's Long Range Planning Division reviewed sites zoned for coastal dependent industrial use (zoned as MC) in the Humboldt Bay Area, resulting in the following conclusions:

– Two potentially suitable sites with appropriate MC zoning for coastal dependent industrial use, one in King Salmon and another in Fields Landing. These sites were dismissed because neither had access to a deep water ocean discharge of treated wastewater. In addition, the identified King Salmon site included the Humboldt Bay Generating Station, which is in existing use as a region's largest power generating facility, including storage of nuclear material, and thus not available for development into a RAS facility.
– There were no sites with Coastal Dependent Industrial zoning within Eureka City limits that met the minimum size requirement of the site.
– Large parcels of MC property on the Samoa Municipal Airport were dismissed because neither had access to a deep water ocean discharge of treated wastewater. Similarly, a 31.9-acre parcel owned by the City of Eureka did not have access to water from Humboldt Bay and thus did not meet the minimum requirements for an alternative site.
– Parcels in Finntown were too small and/or residential and therefore did not meet the requirements for an alternative site.
– The Fairhaven Terminal, California Redwood Chip Export Dock, and Redwood Marine Terminal 1 are also located on the Samoa Peninsula, near the proposed Project, but were found inferior given they did not have access to the ocean outfall and thus did not meet the minimum requirements for an alternative (Humboldt County 2020).

The Alternative Sites Analysis is based upon responses received from the solicited agencies and a review of industrial parcels along Humboldt Bay. The County found the RMT II site, as proposed for the Project, to be the most appropriate location.

4.2.3 Other Off-Site Locations Considered but Rejected

As part of this EIR's alternatives analysis, vacant and underutilized industrial parcels surrounding Humboldt Bay were evaluated as potential locations for off-site locations. These alternatives are summarized below and were evaluated to determine if they meet the qualifications for alternatives receiving full EIR analysis, as required under CEQA. In accordance with CEQA Guidelines Section 15126.6(a), an alternative must meet the following three criteria: 1) the alternative must attain most of a project's basic objectives; 2) the alternative must avoid or substantially reduce the significant environmental impacts of a proposed project; and 3) the alternative must be potentially feasible. An EIR need not analyze an alternative whose impact cannot be reasonably ascertained and whose implementation is remote and speculative. Furthermore, an EIR need not consider every conceivable alternative, but must consider a reasonable range of alternatives that will foster well-informed decision-making and public participation.

Former Sierra Pacific Industries Property

The former Sierra Pacific Industries (SPI) property is located on the Mad River Slough along State Route 255 near northern Humboldt Bay. The property is zoned Industrial (not Coastal Dependent Industrial, as preferred) and was

formerly a mill property. The property is now privately held and was recently encumbered for cannabis development. The property is not presently on the market nor available for development by NAFC.

Legacy contamination is a constraint at the SPI property. The property is served by industrial electrical and water supply and is of comparable size to the proposed Project Site. Unlike the Project Site, however, the SPI property lacks both an industrial water intake from Humboldt Bay and an outfall pipe for effluent discharge. Thus, the Project would require construction of new intake and outfall infrastructure, which would entail in-water construction and horizontal directional drilling over a period of several years. Accordingly, constructing the Project at the SPI site would be impactful to biological resources and water quality, as well as greenhouse gases, air quality, noise, and hazardous resources associated with construction.

California Redwood Company Property

The California Redwood Company (CRC) property is located along Highway 101 along Humboldt Bay, between the cities of Eureka and Arcata. Similar to the SPI property, the CRC property was formerly used as a mill and continues to provide office and other facility space for the CRC presently. The property is not presently on the market nor available for development by NAFC.

The CRC is served by some industrial utilities (e.g., electrical) that once supported the mill. The underutilized portion of the facility is also of comparable size to the proposed Project Site. However, as with the SPI property, the CRC property was rejected from consideration as an off-site alternative because it does not currently have infrastructure for industrial water intake from Humboldt Bay nor effluent discharge. Accordingly, for the same reasons set forth above in the discussion of the SPI property, this option would have significantly greater environmental impacts and was therefore rejected from consideration.

Fields Landing Properties

The County's Alternative Sites Analysis (see Section 4.2.2) identified various industrial properties in Fields Landing appropriately zoned Coastal Dependent Industrial totaling 163.5 acres (Humboldt County 2020). Combined, these properties may be sufficient in size, comparable to the proposed Project Site. The property is not presently on the market nor available for development by NAFC.

The Humboldt Bay Municipal Water District's industrial water line does not extend south to the Fields Landing area, along the eastern edge of Humboldt Bay. The properties lack an industrial water intake from Humboldt Bay, and a new water intake would need to be permitted and constructed. Additionally, as with the SPI property and CRC properties, siting in Fields Landing was also rejected from consideration as an off-site alternative because it does not support effluent discharge, consistent with the County's earlier Alternative Sites Analysis (2020). Accordingly, for the same reasons set forth above in the discussion of the SPI property, this option would have significantly greater environmental impacts and was therefore rejected from consideration.

Samoa Peninsula Properties

The County's Alternative Sites Analysis initially discounted other properties on the Samoa Peninsula that are zoned as Coastal Dependent Industrial because they lacked access to the RMT II ocean outfall (Humboldt County 2020). As part of this EIR's alternatives analysis, those sites were revisited to determine if a viable off-site alternative could be developed, understanding trenching or horizontal directional drilling would likely be required to connect an alternative site with the existing RMT II ocean outfall, and that this would require a significant amount of construction. The County's Alternative Sites Analysis identified four potential alternate locations on the Samoa Peninsula that were dismissed: the Eureka Municipal Airport, Fairhaven Terminal, California Redwood Chip Export Dock, and the Redwood Marine Terminal I (RMT I). See Figure 4-1 – Alternatives Analysis Overview.

The Eureka Municipal Airport Site

The Eureka Municipal Airport site (APN 401-131-004) was considered but rejected due to the large footprint of Environmentally Sensitive Habitat Area (ESHA) likely present on the parcel, given the significant area of undeveloped dune habitat. Development within ESHA for the proposed Project would conflict with the Humboldt Bay Area Plan (LCP) and would likely not be allowable. Despite the parcel's zoning as a Coastal Dependent Industrial property, the site is not currently an industrial site and is largely undeveloped aside from the runway, which remains active. The Humboldt Bay Social Club, a local business with lodging, a bar, and an on-site restaurant, is also located on the parcel. The parcel lacks an industrial water intake, water discharge, and freshwater utilities. An electrical substation, which is a key component of the proposed Project Site, is not present. The parcel is closer in proximity to residential areas of Fairhaven than the proposed Project Site, which conflicts with the objectives of the Project (See Chapter 2 – Project Description for a list of Project Objectives). An onsite septic system would need to be developed for Phase I operation which could have limitations due to high groundwater and course textured soil. For these reasons, the Eureka Municipal Airport was dismissed as a feasible off-site alternative. The property is not presently on the market nor available for development by NAFC.

The Fairhaven Terminal

The Fairhaven Terminal (APN 401-301-017) was considered but rejected for a number of reasons. The property is partially encumbered by an existing business (Fox Farm) and is thus not fully available for redevelopment. The property lacks water supply from Humboldt Bay. The existing water intake from Humboldt Bay would need to be extended to the site from the sea chest at the RMT II dock via a pipeline. The status of electrical and freshwater industrial service to the parcel is unknown. The existing Simpson Outfall associated with the site is in extreme disrepair and unlocatable. The Simpson Outfall would need to be reconstructed, which would be environmentally impactful and require extensive in-water construction. Alternatively, trenching, or horizontal directional drilling could be used to route the effluent discharge northwest to the existing RMT II ocean outfall. The Fairhaven Terminal site also does not presently have a functioning leach field site for septic infrastructure. The septic system is currently vaulted and would not be functional for NAFC Phase 1 operations, in advance of the construction of the Samoa wastewater treatment facility. The property is not presently on the market nor available for development by NAFC. For these reasons, the Fairhaven Terminal site was dismissed as a feasible off-site alternative.

The California Redwood Company Chip Export Dock

The California Redwood Company Chip Export Dock (APN 401-122-008) was considered but rejected because the parcel is too small and presently encumbered in a coastal industrial dependent use. No further consideration was merited.

The Redwood Marine Terminal I (RMT I)

The Redwood Marine Terminal I (RMT I) site is owned by the Harbor District. While the site is largely vacant, RMT I is included in the Harbor District's proposal for a Renewable Energy Port, which would include a seven-acre dock capable of supporting large cargo vessels and assembling wind generating infrastructure. As a Priority I site under the Humboldt Bay Area Plan Coastal Dependent Industrial policies, the parcel is considered by the County to be an existing facility suitable, with minor alteration, to accommodate the proposed use, or that could accommodate the proposed use through expansion.

As with the other Samoa Peninsula properties considered, development of the RMT I site by NAFC would require trenching or horizontal directional drilling to the existing RMT II ocean outfall. Water intake from Humboldt Bay would need to be extended via the Red Tank dock, which is the nearest existing water intake. Given the shape of the parcel, the RAS facility would need to be reshaped and elongated and thus would be located parallel to the shoreline. Extending the facility north to south (increasing length and reducing width compared to the proposed Project footprint) would detrimentally reduce operational efficiencies and is thus infeasible. An extended footprint adjacent to the length of the RMT I site, along the Humboldt Bay shoreline, would also increase the potential for water quality and biological impacts to Humboldt Bay, including wetlands and ESHA located along the shoreline (SHN 2020). The RMT I site is also closer to the Town of Samoa, which would increase the likelihood of potential environmental impacts related to

noise, transportation and circulation, utilities, and other environmental considerations in the CEQA Appendix G checklist. For these reasons, the RMT I parcel alone was dismissed from further consideration.

4.3 Analysis of Alternatives

This section describes the Project alternatives that were selected and analyzed in accordance with CEQA Guidelines Section 15126.6(a). As described above in Section 4.2, other potential alternatives were evaluated, but were determined to be infeasible or would not attain most of the Project's basic objectives.

4.3.1 Alternative 1: No Project Alternative

Description

A No Project Alternative assumes the proposed Project on the RMT II site would not be developed, leaving the RMT II site, as owned by the HBDA, in its present condition.

Analysis

Environmental impact analysis for the No Project Alternative considers each category of the CEQA Appendix G checklist. As discussed in Chapter 5 of this EIR, environmental impacts related to Agriculture and Forestry Resources, Land Use, Minerals, Public Services, Recreation, and Tribal Cultural Resources were determined not to be potentially significant and thus are not assessed below. The No Project Alternative would not result in any significant unmitigatable impacts or eliminate any significant unmitigatable impacts of the proposed Project, as none exist.

Aesthetics

The RMT II site presently suffers from unsightly industrial blight remaining from the former pulp mill, including the 270-foot tall smokestack, and 12 story boiler building visible from Arcata, Eureka, Humboldt Bay, and nearby recreational beaches and dunes on the Samoa Peninsula (Image 4-1). Under a No Project Alterative, the smokestack, twelve story boiler building and other dilapidated industrial infrastructure would remain indefinitely, prolonging the negative visual impact that presently results from the remnants of the former pulp mill. The potential aesthetic impact of the Project would be less than significant, demolishing the industrial blight and replacing it with a new, principally permitted facility designed to blend into the surrounding natural environment and industrial setting. The aesthetic condition would also deteriorate over time, as the current structures are not maintained. Therefore, the No Project Alterative would have a greater aesthetic impact than the proposed Project, and any potential impact would be less than significant.

Image 4-1 Existing Conditions Drone View of the Project Site, Looking North

Air Quality / Greenhouse Gas Emissions / Energy Resources

Under a No Project Alternative, a significant portion of the 25,000 metric tons of fresh fish produced annually by the Project would continue to be imported from international waters, requiring air and freight transport for domestic import to the west coast. International transport of seafood to the west coast would continue to generate significant air and greenhouse gas emissions globally, including California. International transport of seafood also requires consumption of fossil fuels (energy) for freight and ocean harvest. According to The Conservation Fund, RAS aquaculture systems using electric power result in less than half the carbon footprint of open net pen salmon imported from northern Europe non-carbon emission power. The largest portion of the carbon footprint from imported salmon results from airfreight-related climate impacts (The Conservation Fund 2021). The Project would result in a regional alternative for fresh fish with a lower carbon footprint.

While a No Project Alternative would not result in any construction or operational related air quality, greenhouse gas, and energy impacts on the Samoa Peninsula and climate impacts resulting from global seafood trade would persist absent mitigation or regulation. Comparatively, fish produced by NAFC would be transported fresh by truck within the west coast region, comparatively reducing the carbon footprint associated with transport. Air transport would not occur. The proposed Project would require operational energy consumption, which would result in less than significant operational air quality and energy emissions. Construction-related air quality impacts would not occur. The Project would be consistent with the regulations and policies of the North Coast Unified Air Quality Management District Pollutant and toxic air criteria emissions are well below established thresholds and would result in a less than significant impact to greenhouse gases and energy resources Combined with the Project goal to reduce the carbon footprint of fresh fish, the proposed Project would not result in a significant climate impact. The climate impact associated with the ongoing import of international seafood would persist indefinitely under the No Project Alternative. Any potential impact would be less than significant.

Biological Resources

Impacts to biological resources that could potentially occur under the proposed Project were determined to be less than significant with implementation of mitigation measures. The Project Site is a dilapidated, industrial site with remaining soil contamination that does not presently provide high biological value. A special status plant is present on the Project Site and would be impacted under the proposed Project. A No Project Alternative would not impact on-site special status plants as a result of construction. Because botanical-related mitigation would not occur, on 3.49 acres of on-site habitat and 7.22 acres of off-site dune habitat would not be improved via replanting and removal of invasive species. Potential marine impacts to aquatic organisms in Humboldt Bay related to the water intakes also would be less than significant. Discharge of the Project's treated effluent via Nordic's wastewater treatment plant would not occur, resulting in no change to biological resources in the Pacific Ocean. Untreated stormwater would continue to drain to Humboldt Bay and the RMT II ocean outfall via the existing stormwater drainage system on the Project Site. Formal mitigation measures to avoid potential impacts to birds, amphibians, marine mammals, and other wildlife via seasonal work windows, pre-construction surveys, and location-specific restrictions to work during low tidal elevations would not be required to avoid impacts to wildlife, include marine mammals. Potential biological impacts associated with the water intake upgrades would not be avoided, as the Harbor District would independently pursue and implement those actions. Similarly, the potential impacts and benefits associated with the off-site compensatory restoration to remove creosote piles from Humboldt Bay and up to one acre of Spartina would not occur. Implementation of the No Project Alternatives would result in fewer potential biological impacts to the Project Site and surrounding biological study areas and no impact would result.

Cultural Resources

Given a No Project Alternative would not result in any ground disturbance and thus no potential for the inadvertent discovery of cultural or historic resources, implementation of the No Project Alternative may result in fewer potential impacts to cultural and historic resources compared to the proposed Project and no impact would result.

Geology and Soils

Construction of the Project would result in ground and soil disturbance, including the remediation of remaining soil and groundwater contaminants. Impacts to geological resources and soils that could potentially occur under the proposed Project, including erosion during construction, were determined to be less than significant with implementation of mitigation measures. Construction and operation of the Project would not increase seismic-related risks. Existing dilapidated industrial infrastructure, which includes HAZMAT materials, is vulnerable to damage or collapse in the event of an earthquake, resulting in a potential environmental risk. Following implementation of geotechnical recommendations, the Project would be designed and constructed to withstand future ground settlement associated with liquefaction. While ground and soil disturbance would not occur under a No Project alternative and would thus result in fewer related potential impacts, remediation of remaining soil and groundwater contamination would not be completed. The legacy impact remaining from the Project site's industrial history would persist. Thus, the proposed Project is considered less impact to geology and soils, compared to the No Project Alternative, and no impact would result.

Hazards and Hazardous Materials

This Project Site is a Brownfield site that has received funding grants from the U.S. Environmental Protection Agency (EPA) for cleanup and assessment activities. Contaminants of Potential Concern (COPC) identified in site soils were summarized in the Interim Measures Work Plan (SHN 2021). Primary COPCs remaining at the Project Site are chlorinated hydrocarbons, petroleum hydrocarbons and pH (>8.5 pH units). COPCs in groundwater include chlorinated hydrocarbons (chlorinated ethanes and ethenes), dissolved arsenic (As), dissolved chromium (Cr), and dissolved manganese (Mn). Additional parameters of concern include dioxins, pH, color impact from black liquor release, total dissolved solids (TDS), dissolved nickel (Ni), and dissolved chromium VI (Cr VI, SHN 2021). The deteriorating buildings contain ample HAZMAT materials, such as asbestos, and lead which result in an ongoing environmental and human health risk. Through implementation of the Project, much of this contamination would be remediated. By doing this, the Project will eliminate potential risks to human health and the environment associated with potential exposure

to contamination, and will reduce the risk of pollutants in stormwater runoff contaminating local Humboldt Bay and the Pacific Ocean. Finally, the Project will also demolish on-site buildings that are themselves a hazard as well as containing hazardous materials and ensure that those materials are properly disposed. Similarly, the likely benefits associated with the off-site compensatory restoration to remove creosote piles from Humboldt Bay would not occur.

Construction would follow recommendations of the Interim Measures Work Plan (SHN 2021) and resulting required documents, including a Health and Safety Plan and Soil and Gas Monitoring Program to ensure significant hazard-related impacts would not result from the Project. While the No Project Alternative would avoid potential impacts associated with construction, the risk of accidental spills, legacy soil and groundwater contamination, and deteriorated buildings that are a hazard to human safety would persist, including asbestos and lead based paint associated with deteriorating structures. Thus, the proposed Project is considered less impactful to hazards and hazardous materials, compared to the No Project Alternative. Any potential impact would be less than significant.

Hydrology and Water Quality

Implementation of the Project has the potential to impact water quality as a result of temporary construction, operational stormwater discharge, water intake from Humboldt Bay, and water discharge to the Pacific Ocean, although all such potential impacts would be less than significant with the incorporation of mitigation and/or best practices. A No Project alternative would not result in construction or operation-related impacts to hydrology and water quality, although, as discussed above, legacy contamination would not be remediated and more likely to persist indefinitely and potentially contaminate the surrounding waters.

Untreated stormwater would continue to drain to Humboldt Bay and the RMT II ocean outfall via the existing stormwater drainage system on the Project Site, resulting in an ongoing water quality impact. Proposed stormwater detention and treatment upgrades as designed into the proposed Project, which would eliminate off-site discharge even during a 100-year storm event, would not occur. Potential water quality impacts associated with the water intake upgrades would not be avoided, as the Harbor District would independently pursue and implement those actions.

Given the lack of large-scale water intake and discharge associated with the proposed Project, a No Project Alternative would have fewer potential hydrology and water quality related impacts. However, the No Project Alternative would not benefit from stormwater upgrades on the Project Site, and off-site discharges, with drainage emptying directly into Humboldt Bay, would persist. Any potential impact would be less than significant.

Noise

The existing noise setting includes adjacent industrial operations, including an active log yard, trucking and transport-related noises, and noises associated with industrial machinery (e.g., beeping, idling). Under a No Project Alternative, the existing noise setting would remain unchanged. Given a No Project Alternative would not result in any construction or operational noise, implementation of the No Project Alternative would result in fewer potential noise-related impacts compared to the proposed Project and no impact would result.

Population and Housing

A No Project Alternative would not result in any change to population or housing, compared to existing conditions. There would be no potential demand for new housing associated with employees who may relocate to the area as a result of employment at the NAFC facility. No impact would result.

Transportation

Given a No Project Alternative would not result in a change in traffic, transportation or vehicle miles travelled, implementation of the No Project Alternative would result in fewer potential transportation-related impacts compared to the proposed Project. However, the planned transit service, which would also benefit employees of adjacent businesses, would not occur since there would be no warrant of new route users. No impact would result.

Utilities

Under a No Project Alternative, improvements to the on-site electrical substation would not occur. HBMWD water utility infrastructure would not be needed to deliver domestic and industrial water, and HBMWD would not benefit from NAFC as a customer. Improvements to the fire suppression line along the RMT I and RMT II shoreline would still be implemented by the Harbor District, as an independent project. Absent customer demand from NAFC, the HBMWD's water right could be reduced by the State Water Resources Control Board in 2029, due to lack of demand (HBMWD 2011). According to the Water Resources Planning Advisory Committee (2010), one of the key challenges the HBMWD faces is the "non-use of the industrial water system and under-utilization of the District's water rights, which will be lost in the future if not used once again." The No Project Alternative could have detrimental effects for the water supplier that provides water to Humboldt Bay industrial users, creating lasting impacts that would reduce industrial and coastal dependent projects that could otherwise be supported by existing water infrastructure as potential HBMWD industrial water users. Any potential impact would be less than significant.

Wildfire

Grassland wildfires occur on the Samoa Peninsula. In its current condition, the Project Site is vulnerable to a wildfire. Existing abandoned industrial structures and/or surrounding vegetated areas could burn in the event of a wildfire, exacerbating risk to surrounding businesses and industrial properties. Wildfire risk would persist under the proposed Project; however, the proposed Project would include wildfire protection resources, as well as water lines throughout the terrestrial development, new fire hydrants, and emergency fire access roads. Existing abandoned industrial structures would be replaced with state-of-the-art construction consistent with current California Building Code and include fire defense specifications such as overhead sprinklers and increased spacing between buildings, and improvements and maintenance for the existing substation. New emergency fire suppression water lines extending to both RMT I and RMT II would still be implemented by the Harbor District, under a future independent project. The proposed Project would reduce wildfire-related risks, compared to the No Project Alternative. Any potential impact would be less than significant.

4.3.2 Alternative 2: Off-Site Location

In an effort to identify an appropriate and potentially feasible off-site location, the County's Alternative Sites Analysis was revisited (see Section 4.2.3). While the RMT I parcel alone was infeasible due to its extended shape and other stated reasons, an off-site alternative was developed that combined RMT I (APN 401-031-040) with two adjacent parcels to the west owned by Samoa Pacific Group LLC (Danco) (APN 401-031-055 and APN 401-031-070, see Figure 4-2 – Alternatives Analysis: Redwood Marine Terminal I and Danco Property). All three parcels are appropriately zoned Coastal Dependent Industrial and are generally vacant and/or underutilized. These parcels are also presently proposed to be encumbered by the Harbor District as part of a future Renewable Energy Port. This EIR assumes only one of the two proposed uses would occur, not both the NAFC development and the Renewable Energy Port.

Description

Terrestrial Facility

The terrestrial facility would be the same shape as the proposed Project; however, the Off-Site Location Alternative footprint would be narrower in east-west direction and elongated in the north-south direction due to property boundaries constraints (Figure 4-2). Construction techniques would be similar; however, additional quantities of fill would need to be transported to the site to support ground densification. The facility would include the same capacity for fish production and would require the same energy and water inputs. The same discharge volume and characterization of treated effluent would also result. The facility would have a similar exterior appearance as the proposed Project, as well as similar standards for utilities, backup emergency power systems, setbacks, circulation, parking, and operations. However, the facility may be more prominently visible from some areas of the Eureka waterfront, given its extended profile along the shoreline.

Ocean Outfall

The location for the Off-Site Location Alternative lacks access to the existing RMT II ocean outfall for discharge of treated effluent offshore, into the Pacific Ocean. As a result, trenching or horizontal directional drilling would be required to connect the off-site alternative location with the existing RMT II ocean outfall, a linear distance of approximately 0.6 miles or a slightly greater distance if a linear path is infeasible. The volume and characterization of the treated effluent would be the same as the proposed Project's discharge.

Water Intake

The Off-Site Location Alternative would also require water intake via Humboldt Bay. The Red Tank dock water intake is located closer to the Off-Site Location Alternative and would thus be the primary intake source. The RMT II water intake would then become the secondary, backup water source. As with the proposed Project, a trench would connect the water piping, including a fire suppression water line, to the facility for use by NAFC and other leases to the Harbor District. The same volume of water from Humboldt Bay would be required, and the same intake screen upgrades and operational energy requirements would apply to the Off-Site Location Alternative water intake.

Analysis

Environmental impact analysis for the Off-Site Location Alternative considers each category of the CEQA Appendix G checklist. As discussed in Chapter 5 of this EIR, environmental impacts related to Agriculture and Forestry Resources, Land Use, Minerals, Public Services, Recreation, and Tribal Cultural Resources were determined not to be significant and thus are not assessed below. The Off-Site Project Alternative would not result in any significant unmitigatable impacts or eliminate any significant unmitigatable impacts of the proposed Project, as none exist.

Aesthetics

The RMT I and Danco properties are underdeveloped and largely vacant industrial parcels with little remaining above-ground infrastructure. From an aesthetic perspective, the properties suffer from blight and deterioration. The Off-Site Location Alternative would develop the parcels with a new, principally permitted facility designed to blend into the surrounding natural environment and industrial setting. As with the proposed Project, the potential aesthetic impact of the Off-Site Location Alternative would be less than significant. However, the RMT II site would continue to suffer from unsightly industrial blight remaining from the former pulp mill, including the 270-foot tall smokestack, and 12 story boiler building visible from Arcata, Eureka, Humboldt Bay, and nearby recreational beaches and dunes on the Samoa Peninsula. Under an Off-Site Location Alternative, the smokestack, 12 story boiler building, and other dilapidated industrial infrastructure would remain indefinitely, prolonging the visual impact that presently results from the remnants of the former pulp mill. Therefore, Off-Site Location Alternative would have a greater aesthetic impact compared to the proposed Project, as the benefit of demolishing the former pulp mill and smokestack on RMT II would not occur. Any potential impact would be less than significant.

Air Quality / Greenhouse Gas Emissions / Energy Resources

An Off-Site Location Alternative would require additional construction-related emissions, including additional trucking for ground densification-related materials, additional trenching and excavation, construction of a temporary leach field, extension of the freshwater industrial water line, and electrical upgrades. These additional construction-related emissions would result in an increase in air quality, greenhouse gas emissions, and energy resources, compared to the proposed Project. With the incorporation of mitigation, air quality impacts would be less than significant. Mitigation would equivalent to air quality mitigation as defined under the proposed Project, including best practices to control air pollution. Impacts related to greenhouse gases and energy would be less than significant.

Biological Resources

Similar to the proposed Project Site at RMT II, the Off-Site Location Alternative is also a dilapidated, industrial site that is not presently providing high biological value. However, given the Off-Site Location Alternative is extended lengthwise north to south, additional development would be required along the Humboldt Bay shoreline, resulting in

additional potential for biological and water quality impacts within Humboldt Bay as a result of terrestrial construction, including construction-related noise. Potential impacts to terrestrial biological wildlife, such as nesting and migratory birds, would remain equivalent. Wetland and ESHA mapping completed for parcels that comprise the Off-Site Location Alternative identified coastal wetlands (SHN 2020), which would likely be impacted by construction of the facility and would likely require minimum ESHA setbacks that would further constrain the design at the Off-Site Location. Trenching or horizontal directional drilling approximately 0.6 miles or greater to establish connectivity between the Off-Site Location Alternative and the RMT II ocean outfall would result in additional potential biological impacts and disturbance. The volume and characterization of discharge to the Pacific Ocean via the ocean outfall would remain identical between the Off-Site Location Alternative and the proposed Project; thus the potential impact to biological resources and water quality in the Pacific Ocean would be equivalent. An Off-Site Location Alternative would require the same volume of water from Humboldt Bay; thus any potential impacts related to the water intakes would also be equivalent. The potential impacts and likely benefits associated with the off-site compensatory restoration to remove creosote piles from Humboldt Bay and up to one acre of Spartina would still occur and would thus be equivalent to the proposed Project. Given the potential impacts related to development along the Humboldt Bay shoreline and connectivity of the Off-Site Location Alternative parcels to the existing RMT II ocean outfall would be greater than proposed Project and all other potential biological impacts would be equivalent, the Off-Site Location Alternative would have greater potential for biological impaction. With the incorporation of mitigation, any potential impact would be less than significant. Mitigation measures would be equivalent to those defined under the proposed Project; however, site specific details may vary, such as the area required for compensatory mitigation of protected habitats, wetland and ESHA buffers, and the area of Humboldt Bay potentially affected by construction-related noise.

Cultural Resources

All parcels involved in the Off-Site Location Alternative and the proposed Project include an archaeological zoning overlay and are generally considered to be culturally sensitive. It is unknown if cultural resources are present at the Off-Site Location Alternative. Much of the RMT I shoreline was constructed with fill; thus archeological resources would not be present in those areas. As with the proposed Project, at minimum, mitigation measures in the form of protection for inadvertent discoveries of cultural resources and/or human remains would also be required for the Off-Site Location Alternative. The Off-Site Location Alternative would be located within the Samoa Historic District Boundary, which could result in impacts not associated with the proposed Project. For that reason the Off-Site Location Alternative would potentially have a greater impact on cultural resources than the proposed Project. With the incorporation of mitigation, any potential impact would be less than significant. Mitigation would be similar to the proposed Project, focusing on the inadvertent discovery of cultural and historic resources during construction. Additional mitigation may be required to offset potential impacts to the Samoa Historic District.

Geology and Soils

Construction of both the Project and Off-Site Location Alternative would require equivalent construction techniques and ground disturbance. Both sites share a similar industrial land use history. The Off-Site Location Alternative would be located very proximal to the proposed Project, resulting in similar seismic risks associated with earthquakes, liquefaction, and tsunamis. An equivalent environmental impact would result. With the incorporation of mitigation, any potential impact would be less than significant. Mitigation would be equivalent to the proposed Project, focusing on erosion and sedimentation control during construction and the inadvertent discovery of paleontological resources.

Hazards and Hazardous Materials

This Project Site is a Brownfield site that has received grant funding from the U.S. Environmental Protection Agency (EPA) for cleanup and assessment activities. Through implementation of the Project, any remaining contaminants would be remediated. The existing leach field on the proposed Project Site also would not be decommissioned. Under the Off-Site Alternative, remediation activities would no longer occur at the Project Site, and the environmental risk would persist. The upland area at RMT I was previously occupied by mill, port and rail operations that are known to have impacted soil and groundwater with hazardous substances and petroleum hydrocarbons. Most of the known impacts from historical operations have been investigated and properly closed under regulatory oversight. A total of three petroleum sites identified in the planned redevelopment area were determined to require no further action

(Oetker pers. Correspondence 2021). Thus, it is assumed the Off-Site Location Alternative would result in a lower potential for release of legacy contaminants in soil and groundwater, compared to the proposed Project. Existing remnant contamination at RMT II would remain. The likely benefits associated with the off-site compensatory restoration to remove creosote piles from Humboldt Bay would be equivalent between the two alternatives. Overall, the Off-Site Alternative is considered to have a greater potential environmental impact. Given the two alternatives are located proximal, the potential environmental impact associated with an accidental release or as a result of a tsunami, wildfire, or other natural disaster would be equivalent. Any potential impact would be less than significant.

Hydrology and Water Quality

Implementation of the Project has the potential to impact water quality as a result of temporary construction, operational stormwater discharge, water intakes from Humboldt Bay, and treated effluent discharge to the Pacific Ocean, although all such potential impacts would be less than significant with the incorporation of mitigation and/or best practices. An Off-Site Location Alternative would result in a greater potential impact to the waters of Humboldt Bay, given there would be a longer length off the shoreline proximal to the construction footprint of the facility. The RMT II stormwater system at the proposed Project Site would not be upgraded and would continue to discharge off-site through the ocean outfall and into Humboldt Bay, allowing water quality impacts under existing conditions to persist. Potential impacts related to the water intakes from Humboldt Bay and treated effluent discharge to the Pacific Ocean would be equivalent. The potential temporary water quality impacts during construction associated with the off-site compensatory restoration to remove creosote piles from Humboldt Bay and up to one acre of Spartina would still occur and would thus be equivalent to the proposed Project. Any potential impact would be less than significant with the incorporation of mitigation. Mitigation would be equivalent to the proposed Project.

Noise

Construction of the Off-Site Location Alternative would generate an equivalent level and duration of construction (albeit less demolition) and operational noise as the proposed Project. However, the Off-Site Location Alternative would be located closer to sensitive receptors (housing in the community of Samoa) and would thus result in a greater potential for environmental impact. Any potential impact would be less than significant.

Population and Housing

The Off-Site Location Alternative would result an equivalent potential impact to population and housing, as the Off-Site Location Alternative would require the same number of employees and associated demand for housing and related services in the area. Any potential impact would be less than significant.

Transportation

Traffic circulation in Samoa at the Off-Site Alternative location is further from New Navy Base Road and would require additional industrial and commuter traffic through local roadways in Samoa. Thus the Off-Site Location Alternative would result in increased potential transportation-related impacts compared to the proposed Project. Any potential impact would be less than significant.

Utilities

Construction of the Off-Site Location Alternative would have similar utilities requirements, although the HBMWD freshwater industrial line would require extension to access RMT I. Extension of the freshwater industrial line would require ground disturbance and could be potentially environmentally impactful if sensitive terrestrial habitats existed but could not be avoided (e.g., special status plants, wetlands, ESHA, or Sensitive Natural Communities). A new electrical sub-station would also be required. High voltage power lines would also need to be modified to support the campus. Required electrical improvements would result in additional ground disturbance and potential environmental impacts. The facility would have an equivalent demand for energy, domestic and industrial water from HBMWD, seawater from Humboldt Bay via the water intakes, and other utilities (e.g. telecommunications). Given the likely need to extend the freshwater industrial water line, the Off-Site Alternative would be more impactful to utilities. Any potential impact would be less than significant.

Wildfire

Grassland wildfires are known to occur on the Samoa Peninsula. In its current condition, the Project Site is vulnerable to a wildfire. Existing abandoned industrial structures and/or surrounding vegetated areas could burn in the event of a wildlife, exacerbating risk to surrounding businesses and industrial properties. Wildlife risk would persist under the Off-Site Location Alternative; however, the Off-Site Location Alternative would also include wildfire protection resources, such as a new emergency fire suppression water line extending to RMT I, water lines throughout the terrestrial development, new fire hydrants, and emergency fire access roads. The facility would be built with state-of-the-art construction consistent with current California Building Code and include fire defense specifications such as overhead sprinklers. The Off-Site Location Alternative would result in an equivalent environmental impact risk compared to the proposed Project. Any potential impact would be less than significant.

4.3.3 Alternative 3: Fish Species and Water Source

Description

Alternative 3 evaluates the potential for alternative fish species, including Atlantic Salmon as proposed, Steelhead in seawater, Rainbow Trout in freshwater, and Yellowtail Kingfish. Alternate water sources include an oceanic seawater intake from the Pacific Ocean, a Humboldt Bay seawater intake via groundwater, and terrestrial groundwater intake via terrestrial slant wells.

Alternative Fish Species

Four potential fish species are compared in Table 4-2 (Atlantic Salmon [*Salmo salar*] as proposed, Steelhead [*Oncorhynchus* mykiss] in seawater, Rainbow Trout [*Oncorhynchus* mykiss] in freshwater, and Yellowtail Kingfish [*Seriola lalandi*]).

- **Atlantic Salmon** *(Salmo salar)* **-** Of the four species considered, Atlantic Salmon have the greatest viability relative to farming capabilities in RAS, and are thus the species evaluated under the proposed Project. Atlantic salmon are distributed on both sides of the Atlantic Ocean. In Europe, wild salmon breed from western Russia to Iceland and south to northern Spain. In North America, wild breeding populations are historically found from Labrador to Maine. The fossil record and molecular data show that the genera Salmo (Atlantic Salmon, Brown Trout), and Onchorhynchus (Pacific salmon species and steelhead) diverge in evolution more than 15 million years ago (MYA). The speciation of Pacific salmon occurred approximately 6 MYA into the six strains we see today. These strains of Pacific salmon, and not the Atlantic salmon, have been present through the history of Native American tribes along the West coast of the US (Waples et al. 2008).
- **Rainbow Trout** (*Oncorhynchus mykiss*)**-** Rainbow Trout is a freshwater species. Rainbow Trout is the resident life history variant of anadromous steelhead. Based on genetic evaluation, original native Rainbow Trout populations resulted from habitat segmentation of anadromous steelhead, causing Rainbow Trout to become landlocked (e.g., Leitwein et al. 2017). There is a lack of expertise in the industry farming Rainbow Trout compared to Atlantic Salmon, thus the project would be exposed to more risk. Rainbow Trout have a higher feed conversion ratio (FCR) of 1:1.37. The less efficient conversion of feed would result in a higher production of nutrients and feces. Given nutrient removal and feces removal is currently maximized, the volume of nutrients in the treated effluent discharge would increase.
- **Steelhead** (*Oncorhynchus mykiss*)–During pre-application coordination with the Yurok Tribe, strong objections to farming Steelhead were expressed (Yurok Tribe 2021). Thus, Steelhead were not considered feasible and have been eliminated from further consideration.
- **Yellowtail Kingfish** *(Seriola lalandi)* **–**Due to the higher FCR, Yellowtail Kingfish would require additional water treatment and water consumption. There is no market for egg sourcing, which would thus require a large brood stock operation in Humboldt County and import of viable brood stock, and thus an expanded project footprint. Yellowtail Kingfish are less efficient at converting feed and are still largely a wild fish with very low familial lines. FCR depends on final harvest weight and is approximately 1.5. The less efficient conversion of feed would result

in a higher production of nutrients and feces. Given nutrient removal and feces removal is currently maximized, the volume of nutrients in the treated effluent discharge would increase

Table 4-2 Comparison of Potential Fish Species

	Atlantic Salmon (Seawater)	Steelhead (Trout in Seawater)	Rainbow Trout (Freshwater)	Yellowtail Kingfish
Treated Effluent Discharge	Use of about 200 liters per kilogram of feed consumed and an FCR* of 1.05-1.1.	Higher FCR* (1.4-1.5) results in higher amount of nutrients discharged	Higher FCR* (1.4-1.5) results in higher ratio of nutrients discharged Greater quantity of freshwater required for production.	Much higher water uses per pound of fish produced. Up to 50% higher FCR* with higher marine protein content in feed. Would require either a large amount of water for cooling or much higher energy use to cool discharge water to comply with regulations.
CO_2 Impact	Would replace fresh fish imported with airfreight from South America or Europe. About 1/3 of total CO_2 footprint.	There are no imports to replace, thus total CO_2 impact would be higher.	There are no imports to replace, thus total CO_2 impact would be higher.	Would replace some international imports, but still has a higher CO_2 footprint than salmon. Higher consumption of energy and water will impact CO_2 footprint negatively.
Egg Source	– Year-round supply with several sources to ensure reliability – Sufficient quantity – All female – RAS selected breeding program	– Seasonal supply 7months/year (Oct-April) – All female – Standard breeding program	– Year-round supply – All female – Breeding program for recreational fisheries	– No commercial egg supplies – Requires brood-stock onsite – Requires complex hatchery production onsite to achieve fingerlings. – Mixed sex stock
Freshwater Use	Relatively low	Relatively low	Very high	Low – fish performs best in 20-26 parts per thousand (ppt) salinity.
Seawater Use	Relatively high	Relatively high	Relatively low Seawater would only be used for cooling.	– Extremely high – Water use per pound of feed three times higher than Atlantic Salmon. – Large amounts needed for cooling. – A Yellowtail Kingfish facility in Maine is permitted for 28.5 MGD seawater discharge for 8,000 metric ton production.

	Atlantic Salmon (Seawater)	Steelhead (Trout in Seawater)	Rainbow Trout (Freshwater)	Yellowtail Kingfish
Biological Risk	Highly domesticated source stock, and demonstrated farming success. Extensive R&D and experience base in raising this species in aquaculture, also in RAS. Genetics, feeds, fish health, and biosecurity measures are far advanced.	Limited demonstration with species in large seawater RAS. Survival and quality variable through smoltification in seawater.	Research, development, and farming experience is extensive. Limited experience with species in large RAS due to financial limitations	– Limited R&D and farming experience. – Increasing experience in RAS. – No domesticated source stocks. – Survival rate and quality from hatchery can be variable.
Survivability and Hybridization with Local Species if Escaped	Non-native species to west coast. Low survivability as species is not native and fish are highly domesticated. Historic releases on the west coast with no viable, reproductive stock as a result. (Amos and Appleby 1999, Salmon Fish Now 2021). Hybridization experiments with Pacific salmon strains resulted in non-viable offspring. All-female stock prevents reproduction in nature. Impact on local species and habitat based on experience is low.	Native to West Coast saltwater and freshwater systems. Saltwater adapted steelhead have high survivability with potential to impact habitat and native stocks. Even though all-female, still reproductively viable.	Native to California freshwater systems. Can survive on the west coast but transition from fresh to salt water may be difficult to survive. Even though all female, still reproductively viable.	Limited experience on the west coast. Yellowtail Kingfish can survive in southern waters of the west coast, but domesticated fish seldom do (Miegel et al. 2010). Possible breeding and predatory interaction with local marine fish species.
Feed Conversion & Ingredients	1.05-1.1 FCR* Commonly 15-20% marine ingredients in feed, although levels have been continuously subject to reduction.	1.2-1.4 FCR* Similar ingredients to salmon feed.	1.2-1.4 FCR* Similar ingredients to salmon feed.	1.5 FCR* Higher component of marine ingredients in feed. Nutrient requirements less understood.
Local Concerns		Concerns voiced by local tribes, as Steelhead (*Oncorhynchus* mykiss) are considered sacred by some local tribes (Yurok Tribe 2021).		

* FCR = Food Conversion Ratio

Water Source Alternative 1 – Slant Well

A slant well (or number of slant wells) could be drilled to withdraw brackish or saltwater from beneath the ground surface. The saltwater is extracted from the ground via pumping. The Harbor District previously installed a test well at

the Project Site to evaluate the potential water yield. The test well used a five-inch saltwater well and encountered saline water at 320 feet below the ground surface (Harbor District 2018). Although volume tests were not conducted, the goal was to withdraw up to 200 gallons per minute (288,000 gallons per day). The combined capacity of the RMT II and Red Tank dock water intakes would be 8,250 gallons per minute. Approximately 40 slant wells would be required to achieve an equivalent volume of water. Its unlikely 40 slant wells could be spatially situated on the Project Site, given the large size of the facility; there is likely not enough room for such a substantial field of wells. Given the historic soil and potential for groundwater contamination on the site any risk associated with a large scale ground filtered water production system would be deemed too great for a food production system.

Water Source Alternative 2 – Oceanic Seawater Intake

Oceanic seawater intake pipes could be directionally drilled under adjacent properties, New Navy Base Road, and the surf zone, “daylighting” in the Pacific on the ocean floor. An oceanic seawater intake would require substantial in-water construction. The location of the oceanic seawater intake would need to be sufficiently off-shore to avoid the wave energy and shifting sands associated with the surf zone. The pipes would need to be attached to a screened intake system installed from the ocean surface, connected to the directionally drilled pipes, and sufficiently anchored to the seafloor. The screens would require intermittent cleaning to maintain intake screen approach velocities and functionality. A compressed air line would need to be similarly installed parallel to the intake pipes. The compressed air would be used intermittently to clear the screen. The screens would need to be lifted to the surface periodically to be inspected and clean.

Water Source Alternative 3 – Humboldt Bay Seawater Wells

Humboldt Bay seawater intake pipe wells would be drilled beneath the seafloor of Humboldt Bay to extract salt water. Salt water would be brought to the Project Site via piping. The pipe would need to be attached to a screened intake system installed on the Humboldt Bay seafloor, connected to the directionally drilled pipe, and sufficiently anchored to the Humboldt Bay seafloor. The screens would require intermittent cleaning to maintain intake screen approach velocities and functionality. A compressed air line would need to be similarly installed parallel to the intake pipe. The compressed air would be used intermittently to clear the screen. The screens would also need to be lifted to the surface periodically to inspect and clean. More than one Humboldt Bay sea water well would be required to meet the water requirements of the Project. This alternative water source would require substantial in-water construction.

Analysis

Environmental impact analysis for the Fish Species and Water Source Alternative considers each category of the CEQA Appendix G checklist. As discussed in Chapter 5 of this EIR, environmental impacts related to Agriculture and Forestry Resources, Land Use, Minerals, Public Services, Recreation, and Tribal Cultural Resources were determined not to be significant and thus are not assessed below. The No Project Alternative would not result in any significant unmitigatable impacts or eliminate any significant unmitigatable impacts of the proposed Project, as none exist.

Aesthetics

Selection of an alternative fish species would not affect aesthetic resources. Construction of an ocean intake would be predominantly sub-surface and underwater and thus not visible, also not affecting aesthetic resources. Construction and operation of up to 40 slant wells would require above-ground infrastructure, such as a pump house. Any above ground infrastructure could be designed consistent with the rest of the facility’s visual design standards. The Fish Species and Water Source Alternative would not result in any significant aesthetic impacts. Any potential impact would be less than significant.

Air Quality / Greenhouse Gas Emissions / Energy Resources

Given that Rainbow and Trout Kingfish are more feeding-intensive with higher FCR compared to Atlantic Salmon, increased water treatment would be needed, resulting in higher power usage and water exchange per pound of fish. Additional inputs would be needed to operate the required brood stock facility. Energy consumption required for pumping the seawater from the Pacific Ocean or Humboldt Bay to the Project Site would be greater compared to the

proposed Project, given the longer distance between the water intake and the Project Site. The increased energy consumption from the additional energy would result in related increases in air quality and greenhouse gas impacts. Operation of up to 40 slant wells and/or wells beneath Humboldt Bay would require additional pumping and energy use, resulting in an increase in climate-related impacts compared to the proposed Project. With the incorporation of mitigation, air quality impacts would be less than significant. Mitigation would be equivalent to air quality mitigation as defined under the proposed Project, including best practices to control air pollution. Impacts related to greenhouse gases and energy would be less than significant without mitigation.

Biological Resources

Fish escape from the facility would not occur (see Chapter 2 – Project Description and Section 3 – Biological Resources). However, in the entirely hypothetical escape of Rainbow Trout from the RAS facility, Rainbow Trout have the potential to revert to their anadromous life history (Courter et al. 2013, Miguel et al. 2001) and thus present a risk to native habitats in the hypothetical event of escape. Similarly, Yellowtail Kingfish are native to the Pacific Ocean but prefer warmer southern waters, but they could survive in cooler north coast waters in the event of their hypothetical escape from the facility.

Construction of the oceanic or Humboldt Bay seawater intakes would require substantial in-water work and could result in biological and water quality impacts related to sedimentation and direct and indirect harm to aquatic species, including construction-related noise impacts to fish, marine mammals, and other organisms. Noise related to in-water construction and drilling could be impactful to aquatic species, including marine mammals.

Construction of the slant wells could disturb wildlife (e.g., birds). With the implementation of mitigation measures to avoid biological impacts, as described for the proposed Project, potential wildlife impacts would be less than significant and equivalent to the proposed Project. Operation of the slant wells would not be impactful to biological resources.

The potential temporary impacts to biological resources during construction associated with the off-site compensatory restoration to remove creosote piles from Humboldt Bay and up to one acre of Spartina would still occur and would be equivalent to the proposed Project.

With the incorporation of mitigation, any potential impact would be less than significant. Mitigation measures would be similar to those defined under the proposed Project; however, additional mitigation measures would be required to off-set potential impacts related to the construction and operation of alternative water sources to terrestrial and marine resources.

Cultural Resources

Rainbow Trout in freshwater or Yellowtail Kingfish would not affect cultural resources. Construction of the oceanic seawater intake and/or slant wells would involve soil disturbance and thus a potential for disturbance of archaeological resources via inadvertent discovery. The slant wells would be constructed on the Project Site and thus would have an equivalent potential for inadvertent discovery as the proposed Project. The potential for archaeological resources between the Pacific Ocean and Project Site has not been formally evaluated; thus the potential for inadvertent discovery as a result of horizontal directional drilling and other construction methods required for the oceanic seawater intake are not fully known. However, the potential for inadvertent discovery would presumably remain. The Fish Species and Water Source Alternative would have an equivalent potential impact to cultural resources as the proposed Project. With the incorporation of mitigation, any potential impact would be less than significant. Mitigation would be similar to the proposed Project, focusing on the inadvertent discovery of cultural and historic resources during construction.

Geology and Soils

An alternative fish species would not affect geology and soils resources. Construction of the alternative water sources would involve soil disturbance. The need for horizontal and vertical drilling and associated frac out risk would be greater than the proposed Project. Neither activity would increase the seismic risk related to earthquakes, tsunamis, or liquefaction. However, new piping and other water conveyance infrastructure may not be able to withstand a seismic event or tsunami. Given the increased amount of drilling required to install new water withdrawal infrastructure, the

Fish Species and Water Source Alternative would result in a greater potential impact to geology and soils, compared to the proposed Project. With the incorporation of mitigation, any potential impact would be less than significant. Mitigation would be equivalent to the proposed Project, focusing on erosion and sedimentation control during construction and the inadvertent discovery of paleontological resources.

Hazards and Hazardous Materials

An alternative fish species would not involve hazards and hazardous materials. Construction of the oceanic or Humboldt Bay seawater intake and/or slant wells would include the risk of accidental spill and additional soil disturbance, including potentially contaminated soils associated with the former pulp mill. Remaining remnant contamination would be remediated as a result of the Project and would thus not present a significant environmental risk under the Fish Species and Water Source Alternative. The benefits associated with the off-site compensatory restoration to remove creosote piles from Humboldt Bay would be equivalent between the two alternatives. The Fish Species and Water Source Alternative would result in an equivalent potential impact to hazards and hazardous materials, compared to the proposed Project. Any potential impact would be less than significant.

Hydrology and Water Quality

Compared to Atlantic Salmon, Rainbow Trout are more aggressive feeders. At 12 degrees Celsius, Rainbow Trout will eat approximately 25% more feed than Atlantic Salmon. Rainbow Trout also have a higher life cycle turnover rate than Atlantic Salmon. Differences in life cycle turn over, combined with required nutritional differs in fish feed, would result in a different characterization of the treated wastewater discharged through the ocean outfall. Nitrogen, ammonia, and other nutrients of potential concern could be found in higher concentrations. Rainbow Trout would require far more freshwater, compared to a saltwater species. As a result, the Rainbow Trout treated effluent discharge would also be less saline (more dissimilar) than receiving waters. However, a reduced quantity of seawater via Humboldt Bay would be required. Due to a higher FCR, Yellowtail Kingfish would require more intensive water treatment and a larger waste management capacity, also resulting in a larger volume of treated effluent discharged to the Pacific Ocean. Thus, an alternative fish species – Rainbow Trout or Yellowtail Kingfish – would have a greater potential impact to water quality.

Construction and operation of up to 40 slant wells would be more impactful to groundwater resources than the proposed Project. Construction and operation of an oceanic water intake or Humboldt Bay seawater well would be more impactful to marine water quality than the proposed Project.

The potential temporary water quality impacts during construction associated with the off-site compensatory restoration to remove creosote piles from Humboldt Bay and up to one acre of Spartina would still occur and would thus be equivalent to the proposed Project.

Any potential impact would be less than significant with the incorporation of mitigation. Mitigation would be equivalent to the proposed Project.

Noise

An alternative fish species would not involve a change in noise. Construction of the oceanic water intake and slant wells would involve construction-related noise at levels no greater than the construction-related noise of the proposed Project. Operational noise associated with the oceanic water intake and slant wells would primarily result from pumping and maintenance and would be less than significant. The Fish Species and Water Source Alternative would result in an equivalent potential impact to noise, compared to the proposed Project. Any potential impact would be less than significant.

Population and Housing

The Fish Species and Water Source Alternative would have an equivalent effect on population and housing as the proposed Project, as population and housing would not be affected differently. Any potential impact would be less than significant.

Transportation

The Fish Species and Water Source Alternative would have an equivalent effect on transportation as the proposed Project, as transportation would not be affected differently. Any potential impact would be less than significant.

Utilities

Farming Rainbow Trout would result in additional freshwater six million gallons per day (MGD) demand via the HBMWD and a reduced seawater demand. Farming Yellowtail Kingfish would result in a decreased freshwater demand via the HBMWD and an increased seawater demand. Farming either Rainbow Trout or Yellowtail Kingfish would require additional energy delivered via the existing electrical utility. All additional demands of water and power are within the existing capacity of utility service providers. No other changes to utilities would result, compared to the proposed Project.

Construction of an oceanic or Humboldt Bay seawater intake and/or up to 40 slant wells would decrease demand on the existing seawater intakes (sea chests) from Humboldt Bay. However, the Harbor District would continue to pursue planned upgrades to the sea chests at the RMT II and Red Tank docks for its other current and future uses. Thus, the construction of the oceanic seawater intakes and/or up to 40 slant wells would be in addition to the existing sea chests used for water intake in Humboldt Bay, resulting in a greater utility impact. Any potential impact would be less than significant.

Wildfire

The Fish Species and Water Source Alternative would have an equivalent effect on wildfire as the proposed Project, as wildfire would not be affected differently. Any potential impact would be less than significant.

4.4 Environmentally Superior Alternative

Table 4-3 – Comparison of Alternatives to the Proposed Project compares the impacts of the proposed Project with each of the three considered alternatives and includes summaries of level of significance for each resource category. Of the three alternatives considered, the No Project Alternative (Alternative 1) would be the environmentally superior alternative, as potential impacts related to all resource categories except aesthetic resources, hazards, and hydrology and water quality would not occur. Construction, biological, noise, water quality, soil disturbance, and other related impacts would be avoided. Ongoing water quality degradation associated with the existing stormwater system would remain, as stormwater presently has the potential to interact with remaining COPCs and drains to Humboldt Bay and the Pacific Ocean via the ocean outfall. Potential operational impacts related to energy consumption, transportation, and greenhouses gases would also be avoided. However, the aesthetic impact would be greater, as the existing industrial blight, including the smokestack, 12 story boiler building, black liquor tanks, black liquor recovery pit, and other partially demolished buildings would remain indefinitely on the Project Site. Additionally, the remnant contamination from the former pulp mill would also remain on the Project Site, resulting in a greater environmental impact related to hazards and hazardous materials, especially in the event of a major Cascadia event. Similarly, compensatory off-site restoration to remove creosote piles and up to one acre of Spartina in Humboldt Bay would not occur. A No Project Alternative would entirely fail to meet any of the goals and objectives of the Project.

Under the Off-Site Location Alternative (Alternative 2), the same hazard related impacts would persist as under the No Project Alternative. Industrial blight and legacy contamination at RMT II would remain. The aesthetic impact would be greater, as the existing industrial blight, including the smokestack, would remain indefinitely on the RMT II proposed Project Site. Given the facility would be the same size, albeit with a different layout, potential construction and operational related impacts would be very similar to the proposed Project. The Off-Site Location Alternative would affect a greater length of the Humboldt Bay shoreline, resulting in an increased potential for impacting biological and water quality resources in Humboldt Bay. Additional ground disturbance and horizontal directional drilling would be required to provide connectivity with the existing RMT II ocean outfall, resulting in an increase in ground disturbance and potential impacts related to biological resources and geology (e.g., erosion). The Off-Site Location Alternative would also be located closer to the community of Samoa, resulting in an increase in potential noise and transportation related objectives and would be constructed in a historic district. The Project objective of avoiding proximity to

residential housing would not be achieved. Potential impacts and benefits associated with the off-site compensatory restoration would be equivalent between the Off-Site Alternative and the proposed Project. Overall, the Off-Site Location Alternative would result in greater potential environmental impacts and does not achieve all Project objectives. Alternative 2 is not the environmentally superior alternative.

The Fish Species and Water Source Alternative (Alternative 3) would result in the same facility footprint and size at the Project Site. Farming Rainbow Trout or Yellowtail Kingfish would result in the discharge of additional nutrients and/or a greater volume of treated effluent into the Pacific Ocean. Additional, energy would be required to cool the facility and support increased water exchange, as a result of the differing FCRs of the two alternative species. Neither species is preferred by the market (e.g., less profitable) and thus potentially infeasible economically. Egg sources for the two alternative species are less viable, and a broodstock facility would need to be constructed as well. In the event of a hypothetical fish escape, either Rainbow Trout or Yellowtail Kingfish could result in a higher detrimental impact to the environment, compared to the proposed Atlantic Salmon, given they would have a higher potential to survive in the wild. As noted in Section 4.3.3. – Alternative 3, Steelhead were dismissed as an alternative fish species based on concerns expressed by the Yurok Tribe. Thus, there is no substantive environmental benefit of selecting an alternative fish species.

Similarly, construction and operation of a new oceanic water intake would require extensive in-water construction and thus potential environmental impacts. The oceanic water intake would result in its own biological and water quality impacts, resulting from both construction and operations. Pumping would require significant operational energy resources. Up to 40 slant wells would be required to achieve equivalent water withdrawals, compared to the existing Humboldt Bay seawater intakes at the RMT II and Red Tank docks. Assuming there is enough room for 40 slant wells on the Project Site, which is unlikely, the slant wells would increase potential impacts to groundwater resources and would require substantial operational energy requirements, resulting in an increased to climate related resources. Even if NAFC elected not to utilize the Humboldt Bay seawater intakes, the Harbor District would continue to independently pursue upgrades to the two intakes for their existing and future lessees and other coastal industrial uses. Thus, impacts related to the oceanic seawater intake and up to 40 slant wells would be in addition to the water intakes from Humboldt Bay, not instead of such impacts. A potential cumulative impact would thus result. Potential impacts and benefits associated with the off-site compensatory restoration would be equivalent between the Fish Species and Water Source Alternative and the proposed Project.

With the incorporation of mitigation measures, the proposed Project would not result in any significant environmental impacts. Additionally, the proposed Project achieves all the goals and objectives of the Project. Of the three alternatives considered, the Off-Site Location Alternative (Alternative 2) and the Fish Species and Water Source Alternative (Alternative 3) would not be less environmentally impactful than the proposed Project. Only the No Project Alternative (Alternative 1) would be less impactful to the environmental; however, the goals and objectives of the Project would not be achieved, and the current degraded brownfield site would remain as is with its current negative impacts and hazards.

Table 4-3 Comparison of Alternatives to the Proposed Project

Potential Impact	Proposed Project	Alternative 1 No Project	Alternative 2 Off-Site Location	Alternative 3 Fish Species and Water Source
Aesthetics	*Less Than Significant* Existing industrial blight would be removed, including the smokestack. The facility would be constructed to modern visual standards	*Less than Significant* Aesthetic impacts would be greater, as existing industrial blight would remain.	*Less than Significant* Existing industrial blight at RMT II would not be removed, resulting in an increase visual impact. The facility would be constructed to modern visual standards.	*Less than Significant* Same as proposed Project.
Air Quality, Energy, & Greenhouse Gases	*Less Than Significant with Mitigation* Climate related impacts would be less than significant. Mitigation measures have been incorporated for air quality.	*Less Than Significant with Air Quality Mitigation* Climate related impacts would greater than the proposed Project due to additional international air freight emissions.	*Less Than Significant with Air Quality Mitigation* Climate related impacted would be equivalent the proposed Project.	*Less Than Significant with Air Quality Mitigation* Additional operational energy would be required for alternative fish species and water sources, resulting in a greater impact.
Biological Resources	*Less Than Significant with Mitigation* Mitigation measures would be implemented to ensure biological and aquatic resources were protected. Wetland impacts would not occur. Impacts would be less than significant after mitigation.	*No Impact* On- and off-site dune habitat enhancement would not occur.	*Less Than Significant with Mitigation* Similar to the proposed Project; however horizontal directional drilling and other ground disturbance would be required to provide connectivity to the RMT II ocean outfall, resulting in an increased potential for biological impacts.	*Less Than Significant with Mitigation* Construction of the oceanic seawater intake could result in potential impacts to habitat and aquatic species in the ocean. Otherwise, same as proposed Project.
Cultural Resources	*Less Than Significant with Mitigation* Impacts to cultural and historic resources would be less than significant. Inadvertent discovery protocols would be implemented to protect any uncovered resources not identified by the Project's cultural resource investigation and related tribal consultation.	*No Impact* No cultural or historic resource impacts would occur.	*Less Than Significant with Mitigation* This alternative would be constructed in an historic district. Inadvertent discovery protocols would be implemented to protect any uncovered resources not identified by the Project's cultural resource investigation and related tribal consultation.	*Less Than Significant with Mitigation* Same as proposed Project.
Geology and Soils	*Less Than Significant with Mitigation* Impacts to geologic and soil resources would be less than significant. Inadvertent discovery protocols would be implemented to protect any uncovered paleontological resources.	*No impact* No impacts to geology and soil resources would occur.	*Less Than Significant with Mitigation* Similar to the proposed Project; however horizontal directional drilling and other ground disturbance would be required to provide connectivity to the RMT II ocean outfall, resulting in an increased potential for geological impacts.	*Less Than Significant with Mitigation* Additional ground disturbance would be required for horizontal and drilling for new water sources. Otherwise, same as the proposed Project.
Hazards and Hazardous Materials	*Less Than Significant* Hazards and hazardous materials impacts would be less than significant after mitigation. The proposed Project would	*Less Than Significant* Existing contamination at the Off-Site Alternative is low; however, legacy contamination at the proposed Project Site	*Less Than Significant* Existing contamination would remain at RMT II. The overall impact is considered greater than the proposed Project.	*Less Than Significant* Same as proposed Project.

Potential Impact	Proposed Project	Alternative 1 No Project	Alternative 2 Off-Site Location	Alternative 3 Fish Species and Water Source
	remediate remaining contamination from the former pulp mill.	would remain, resulting in a greater impact comparatively.		
Hydrology and Water Quality	*Less Than Significant with Mitigation* Hydrology and water quality impacts would be less than significant after mitigation.	*Less Than Significant* The existing stormwater system would not be upgraded and would continue to discharge to Humboldt Bay and the ocean outfall to the Pacific Ocean.	*Less Than Significant with Mitigation* Similar to as proposed Project. However, the existing stormwater system at the Project Site would not be upgraded and would continue to discharge to Humboldt Bay and the ocean outfall to the Pacific Ocean.	*Less Than Significant with Mitigation* Alternative fish species would result in discharge of additional nutrients and/or additional volume of treated effluent, resulting in a potential increased environmental impact to water quality.
Population and Housing	*Less Than Significant* Potential impacts to population and housing would be less than significant.	*No Impact* No impacts to population and housing would occur.	*Less Than Significant* Same as proposed Project.	*Less Than Significant* Same as proposed Project.
Noise	*Less Than Significant* Potential impacts to noise would be less than significant.	*No Impact* No impacts to noise would occur.	*Less Than Significant* The facility would be located closer to sensitive noise receptors in Samoa and thus would have a greater potential for noise related impacts	*Less Than Significant* Same as proposed Project.
Transportation	*Less Than Significant* Potential impacts to transportation would be less than significant.	*No Impact* No impacts to transportation would occur, although new transit service would not be added to the RMT II proposed Project Site.	*Less Than Significant* Similar to the proposed Project; however increased transportation impacts could occur given the distance from the Off-Site Alternative location to New Navy Base Road and circulation constraints within Samoa.	*Less Than Significant* Same as proposed Project.
Utilities	*Less Than Significant* Potential impacts to utilities would be less than significant.	*Less Than Significant* Planned utilities upgrades would not occur, resulting in an increased impact.	*Less Than Significant* Expansion of the existing freshwater industrial water line and electrical infrastructure would be required, resulting in an increased impact.	*Less Than Significant* Similar to the proposed Project; however additional freshwater would be required for Rainbow Trout and additional seawater would be required for Yellowtail Kingfish. Additional electricity would also be required.
Wildfire	*Less Than Significant* Potential impacts to wildfire would be less than significant.	*Less Than Significant* No impacts to wildfire would occur.	*Less Than Significant* Same as proposed Project.	*Less Than Significant* Same as proposed Project.

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GHD

Nordic Aquafarms California, LLC
Samoa Peninsula Sustainable Aquaculture Development Project
Samoa, Humboldt County, California

Project No. **11205607**
Revision No. **-**
Date **Aug 2021**

Alternatives Analysis Overview

FIGURE 4-1

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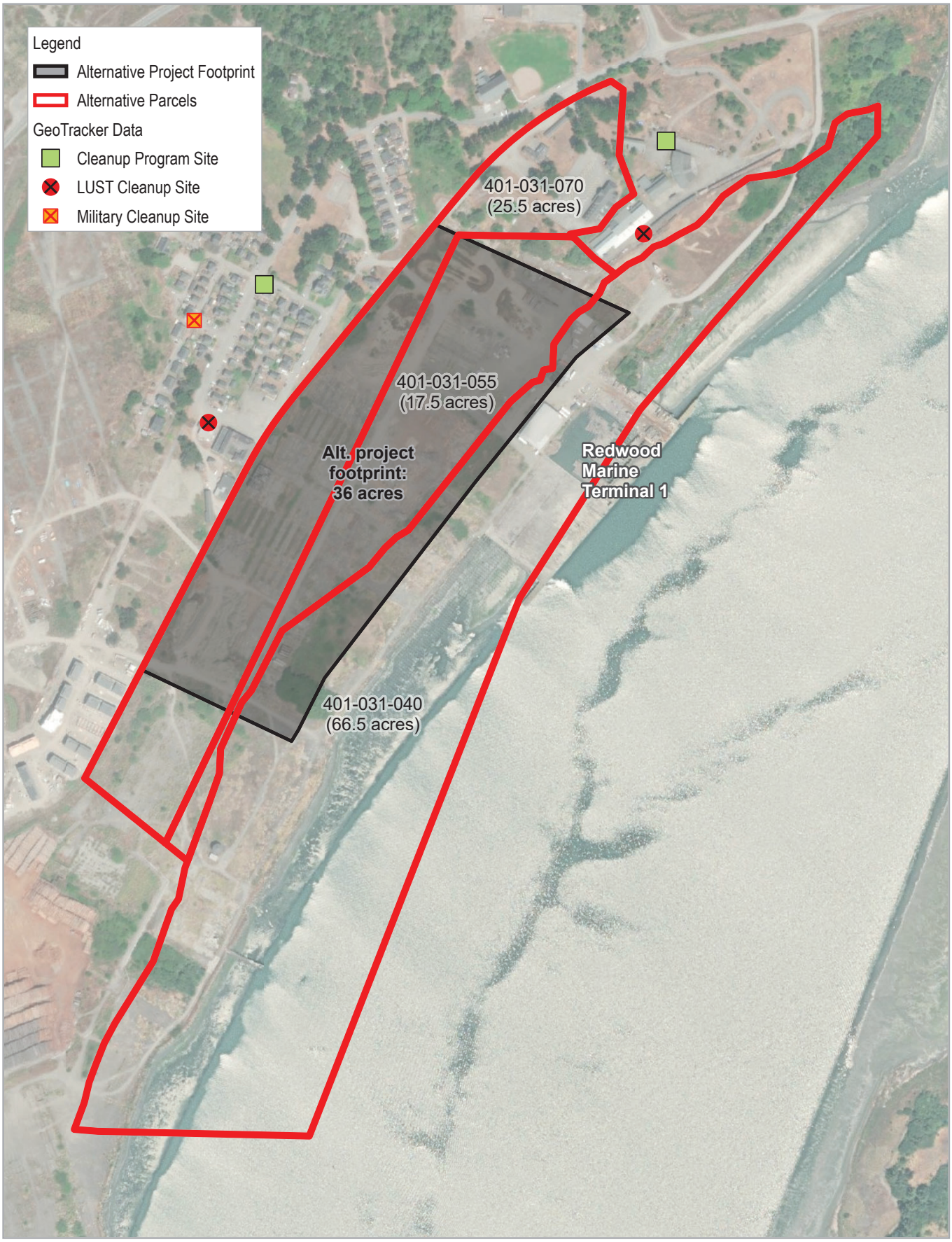
Data source: Project design elements, April 1st, 2021; APE, June 12, 2020; USDA, NAIP Imagery, 2018; Humboldt County Parcel Dataset, 2019transportation: USGS The National Map: National Transportation Dataset; U.S. Census Bureau – TIGER/Line; U.S. Forest Service. Data Refreshed July, 2021.
World Imagery: Maxar. Created by: jclark2



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Nordic Aquafarms California, LLC
Samoa Peninsula Sustainable Aquaculture Development Project
Samoa, Humboldt County, California

Alternatives Analysis: Redwood Marine Terminal 1 and Danco Property

Project No. **11205607**
Revision No. **-**
Date **Aug 2021**

FIGURE 4-2

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Data source: Project design elements, April 1st, 2021; APE, June 12, 2020; USDA, NAIP Imagery, 2018; Humboldt County Parcel Dataset, 2019, GeotrackerWorld Imagery: Maxar. Created by: jclark2