Harbor District Development Permit Application Package

Eureka Flood Reduction and Sea Level Rise Resiliency Project

City of Eureka

September 22, 2023

→ **The Power of Commitment**

GHD
718 Third Street,
Eureka, California 95501, United States
T +1 707 267 2213 **E** kristen.orth-gordinier@ghd.com | **ghd.com**

Contents

Attachments

HUMBOLDT BAY
HARBOR, RECREATION AND CONSERVATION DISTRICT

P.O. BOX 1030
Eureka, California 95502
(707) 443-0801
(707) 443-0800 fax

Date Filed_______________

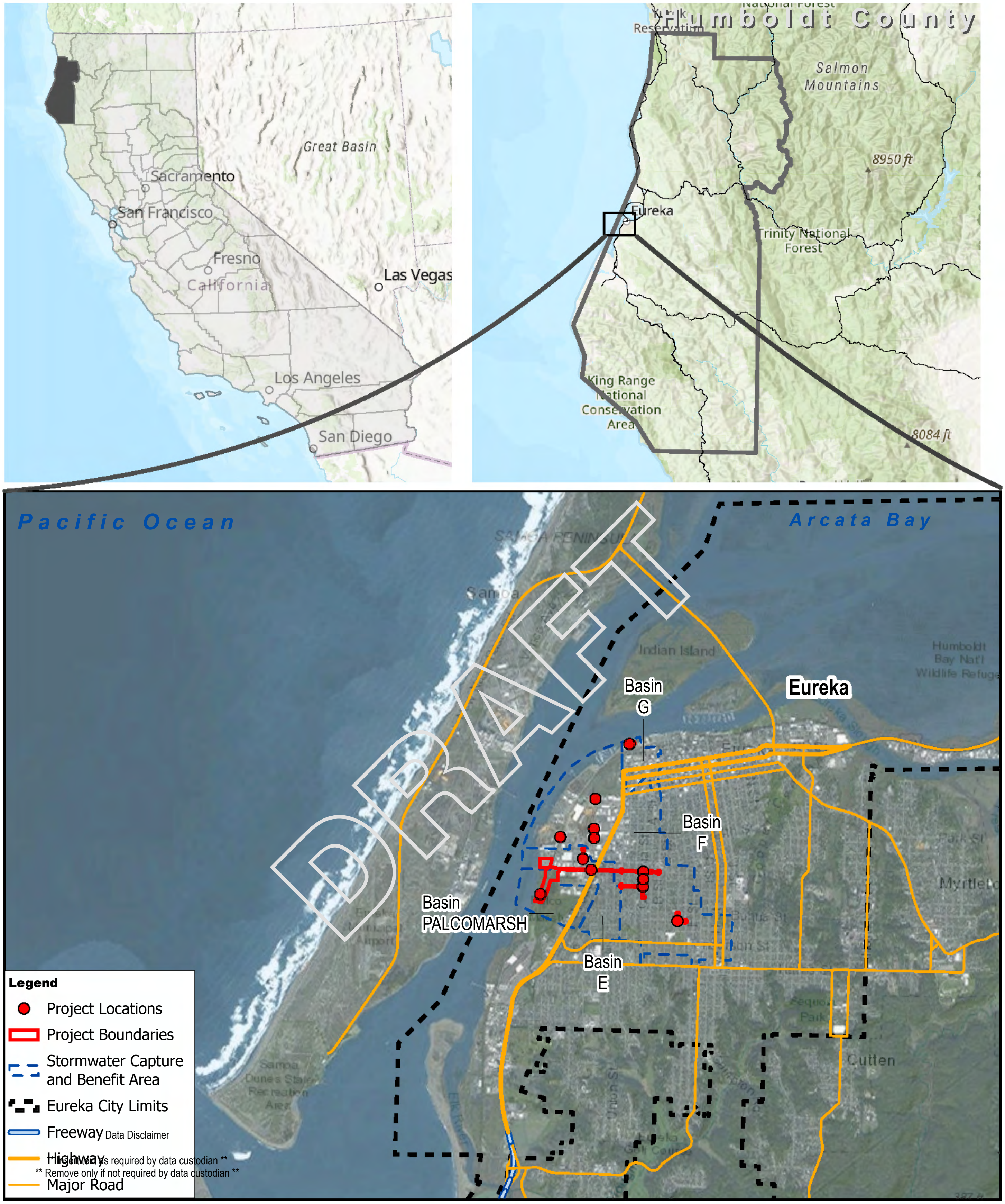
General Information	For Commission Use
1.) Name & Address of Developer, Project Sponsor and Legal Owner City of Eureka 531 K Street Eureka, CA 95501	A. Application No.__________________ Application Type: Franchise ☐ Permit ☐ Lease ☐
2.) Address of Project and Assessor's block, lot and Parcel Number See Attachment 1	B. Date Received by Harbor District C. Date Accepted for filing by BOC
3.) Name, Address and Telephone No. of Person to be contacted concerning this project Kelly Allen (707) 268-5253 kallen@eurekaca.gov	D. Date of Public Notice E. Date of Acceptance EIR or Negative Declaration F. Date of Public Notice G. Date of Public Hearings
4.) Attach list of names and addresses of all adjoining property owners See Attachment 2	H. Date of Approval Disapproval ________ Conditional ________ Approval ________
5) List and Describe any other related Permits & Other Public Approvals required for this Project, including those required by City, Regional, State & Federal Agencies. See Attachment 3	I. Expiration Date
6.) Existing Zoning District Natural Resources, Parks	Describe in detail the proposed project: Comments
7.) Proposed Use of Site (Title of Project for which this form is filed) Eureka Flood Reduction and Sea Level Rise Resiliency Project	

Describe in detail the proposed project

The City of Eureka (City) Flood Reduction and Sea Level Rise Resiliency Project (Resiliency Project) includes multiple locations within central and western areas of the City (Figure 1 and Figure 2). The Resiliency Project would provide flood reduction and sea level rise resiliency through the replacement of undersized storm drain piping and culverts, installation of tide gates to manage flows and limit salt water intrusion into the stormwater system, construction of Low Impact Development (LID) features including rain gardens, and limited earthwork within Palco Marsh to increase stormwater storage capacity. The Resiliency Project would also include the installation of trash capture devices (TCDs) to reduce the amount of pollution that could potentially enter Humboldt Bay. One of the Resiliency Project locations is jurisdictional to the Harbor District.

Work jurisdictional to the Harbor District is occurring at Palco Marsh. This location is also referred to as the Railroad Region and will be referred to as the "Project" throughout this application (Figure 2.1). The nearest cross streets are Del Norte St. and Railroad Ave. Enhancements to the existing muted tidal system at Palco Marsh include channel excavation and replacement of the existing hydraulic conveyance structure between the marsh and Humboldt Bay with larger capacity culverts and adjustable flap gates. The new culverts and tidal channel would increase the lower tidal range, match existing tidal inundation duration, store peak water levels within the marsh area and avoid offsite flooding, enhance sediment exchange from the Bay to Palco Marsh, reduce velocities within the crossing, and enhance sediment deposition on the marsh plain to promote adaptation of the marsh ecosystem to rising sea levels. A TCD that contains a tide gate would be located at the existing Del Norte Street and Railroad Avenue outfall into Palco Marsh and would connect to newly replaced stormdrain pipes adjacent to Palco Marsh. Excavation of approximately 350 feet of new channel would occur in the northern extent of Palco Marsh to between elevation 2 ft to 2.5 ft; excavation of a tidal pond with a sill at Mean Tide Level (MTL) in an existing low elevation area; deepening 800 feet of existing channel ranging in flow line elevation 3 ft to 5 ft to a range of 1.5 ft to 2 ft; and placement of excavated soils in Palco Marsh in locations that have subsided and no longer exhibit marsh habitat or elevations.

See Attachment 4 CEQA ISMND for additional detail on the Palco Marsh area improvements as well as a description of the Flood Reduction and Sea Level Rise Resiliency Project. See Attachment 7 for Design Plans (sheet C-120-C-125 and C-201-C-202).



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City of Eureka
Flood Reduction and
Sea Level Rise Mitigation Project

Project Concept
Location Map

Project No. **12566459**
Revision No. **-**
Date **Jun 2022**

FIGURE 1

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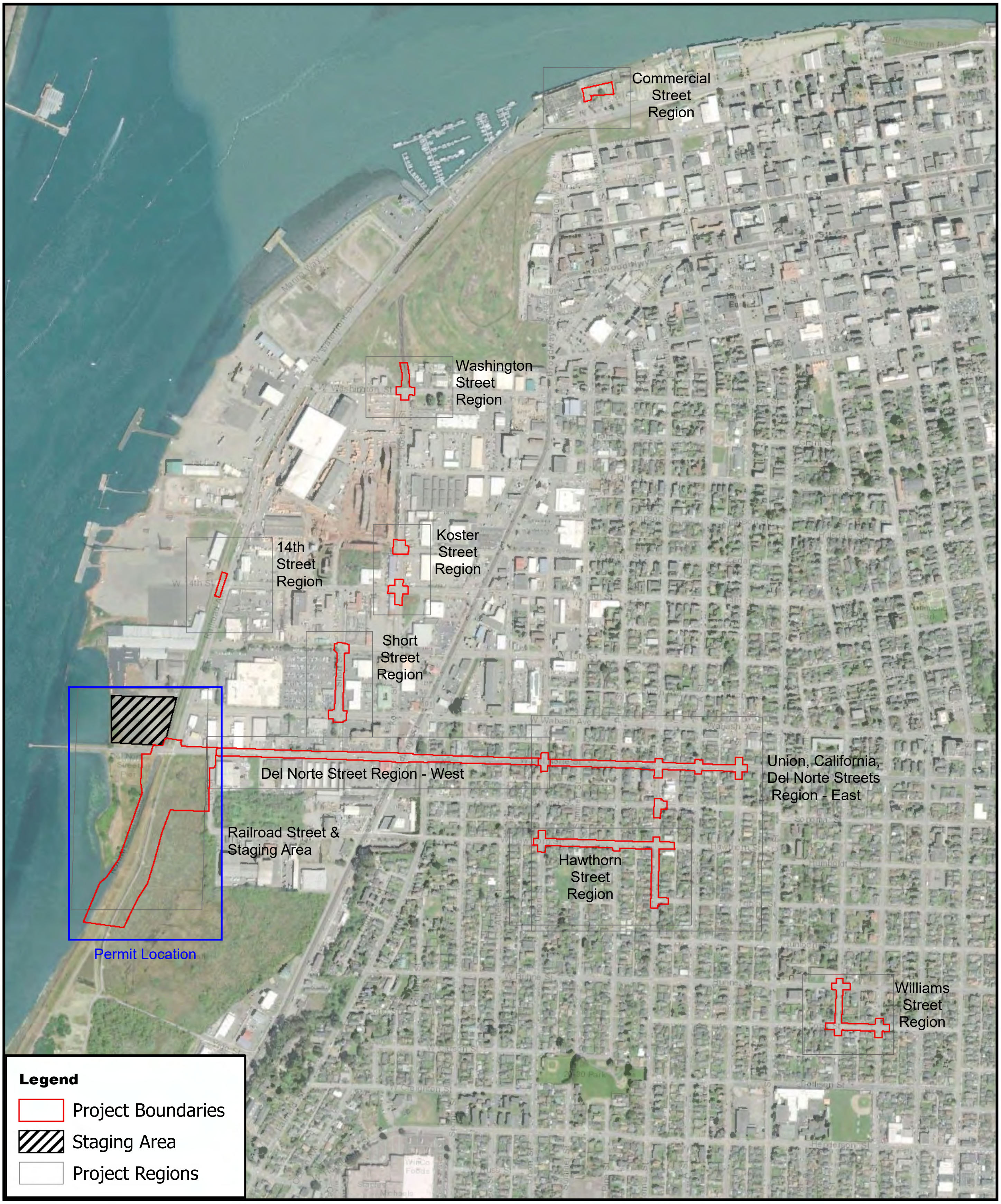

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City of Eureka
Flood Reduction and
Seal Level Rise Resiliency Project

Project No. **12566459**
Revision No. **A**
Date **Jul 2022**

Project Boundary Map

FIGURE 2

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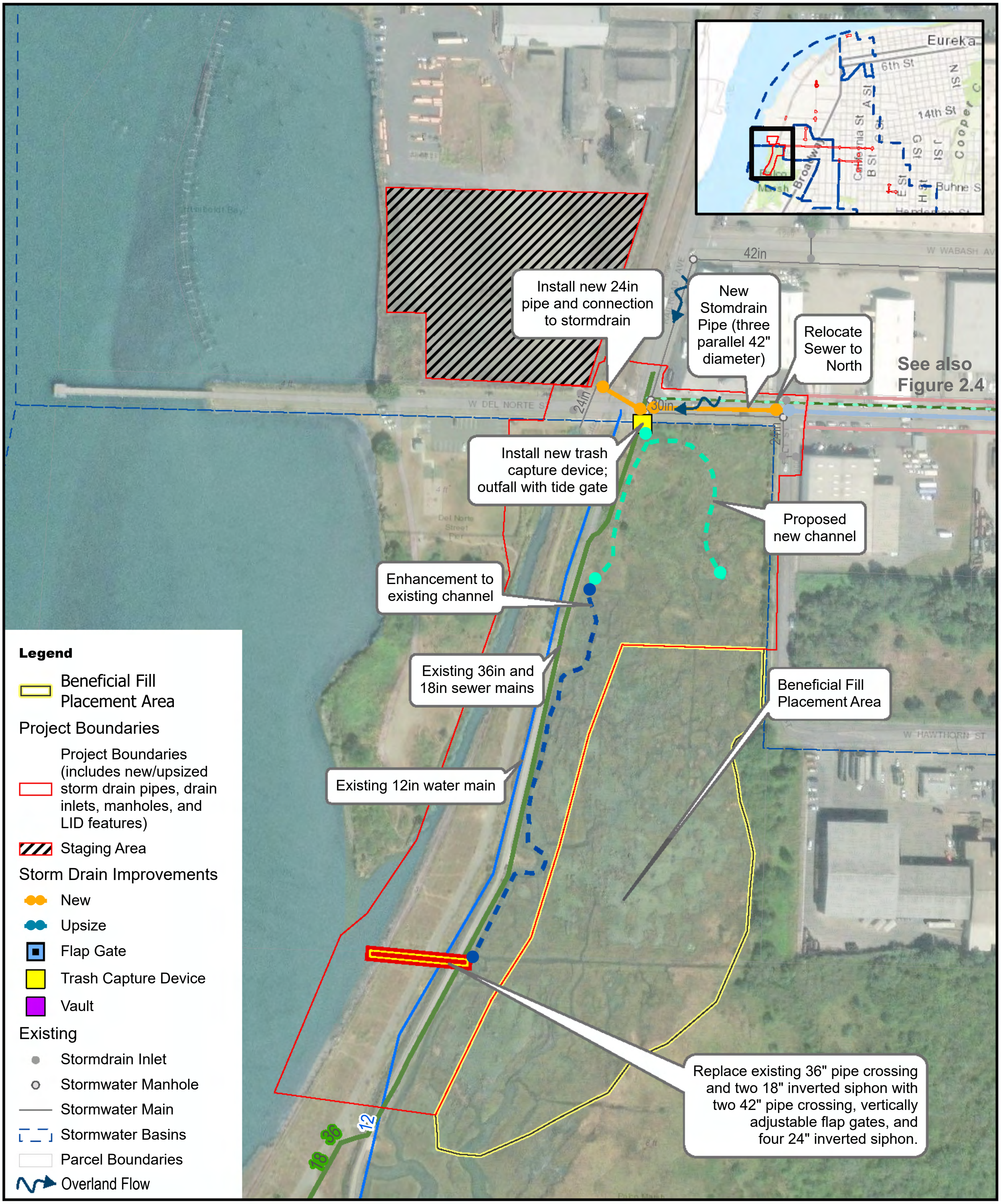

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Map Projection: Lambert Conformal Conic 2SP
Horizontal Datum: North American 1983
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City of Eureka
Flood Reduction and
Sea Level Rise Resiliency Project

Project Concept
Railroad Region & Staging Area

Project No. **12566459**
Revision No. **A**
Date **Sep 2023**

FIGURE 2.1

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Data source: World Topographic Map; Bureau of Land Management, Esri, HERE, Garmin, USGS, EPA, USDA;World Topographic Map; Bureau of Land Management, Esri, HERE, Garmin, USGS, METI/NASA, NGA, EPA, USDA;World_Imagery; Maxar. Created by: djones3

Answer all questions completely. If the question does not apply to your project, so indicate by marking N.A. If you have questions, please contact the Harbor District Office.

Project Description

8.Site Size

The activities at Palco Marsh will occur at multiple locations across approximately 15 acres.

9.Square Footage

The excavation of new channels within Palco Marsh will total approximately 15,315 sf. The deepening of existing channels will total approximately 15,050 sf. The footprint area of the inverted siphon replacement that occurs within wetlands is approximately 845 sf. The trash capture device footprint area within wetlands is approximately 540 sf.

10.Number of floors of construction

n/a

11.Amount of off-street parking provided

No new parking will be provided, and no existing parking will be removed.

12.Attach plans

See Attachment 7.

13.Proposed scheduling

Construction of the Resiliency Project would occur within one to two construction seasons, likely commencing in the late spring/early summer 2024 and continuing eight to twelve months. Construction of the Palco Marsh area elements will require approximately eight weeks and would be limited to occur from June 15 through October 15. If feasible, vegetation clearing outside of the nesting bird season would occur first, prior to March 15 or after August 15. Vegetation clearing would consist of removal of herbaceous plants and shrubs; no tree removal is anticipated.

14.Associated projects

The activities conducted within the Palco Marsh area are a component of the larger Resiliency Project. The Resiliency Project takes place in multiple locations across central and western Eureka and will provide much needed improvements to the community’s drainage infrastructure to reduce current and future flooding. These improvements include replacing undersized storm drain pipes, installing tide gates and trash capture devices, constructing a new storm drain pipe alignment, LID features, and enhancing Palco Marsh. See Attachment 4 ISMND Section 1 for a detailed description of the Resiliency Project.

15.Anticipated incremental development

Incremental development is not anticipated from the Palco March component of the Resiliency Project or the remainder of the Resiliency Project. The construction of the Resiliency Project will be complete in one to two construction seasons, serves existing stormwater maintenance needs, and addresses future sea level rise conditions.

16.If residential, include the number of units, schedule of unit sizes, range of sale prices or rents, and type of household size expected.

n/a

17.If commercial, indicate the type, whether neighborhood, city or regionally oriented, square footage of sales area, and loading facilities

n/a

18.If industrial, indicate type, estimated employment per shift, and loading facilities.

n/a

19.If institutional, indicate the major function, estimated employment per shift, estimated occupancy, loading facilities, and community benefits to be derived from the project.

n/a

20.If the project involves a variance, conditional use or recognizing application, state this and indicate clearly why the application is required.

The Project obtained a City of Eureka Conditional Use Permit (CUP-23-0004) on August 14, 2023. Because the improvements within Palco Marsh are located in the Natural Resource (NR) zone, the Project required a CUP from the City.

Are the following items applicable to the project or its effects? Answer yes or no. Discuss all items answered yes.

21.Change in existing features of any bays, tidelands, beaches, lakes or hills, or substantial alteration of ground contours.

The ground contours in Palco Marsh will be modified slightly through the creation of the new tidal channel, deepening of existing tidal channel, and placement of excavated spoils in locations that have subsided and no longer exhibit marsh habitat or elevations. The functionality of the marsh will be equivalent or improved. See question 26 for a summary of drainage related changes; Attachment 4, CEQA ISMND Section 1 Project Information, subsection 1.8 Palco Marsh and Attachment 5 Permit Support Memorandum for more information on Project design.

22.Change in scenic views or vistas from existing residential areas or public lands or roads.

No. Project components are at or below ground elevation and will not block or significantly alter views of Humboldt Bay from residential areas, public lands, or roads. See Attachment 4, CEQA ISMND Section 3.1 Aesthetics for additional analysis.

23.Change in pattern, scale or character of general area of project.

No. The Project will maintain the visual character of the area. The work proposed in Palco Marsh, which includes extension, deepening and widening of an existing channel between the existing Humboldt Bay tidal inlet and Del Norte St. stormwater outfall, will look similar to the existing conditions in the tidally influenced marsh. The TCD would be visible though would look similar to existing surrounding stormwater infrastructure and urban development along Del Norte St. For more information, see Attachment 4, CEQA ISMND Section 3.1 Aesthetics.

24.Significant amounts of solid waste or litter.

No. The Project will generate limited solid waste during construction. Project operation would involve routine cleaning of the TCD and is not expected to generate a significant increase of services for solid waste disposal needs. See Attachment 4, CEQA ISMND Section 3.19 Utilities and Service Systems for analysis.

25.Change in dust, ash, smoke, fumes or odors in vicinity.

No change in ash or smoke will occur in the vicinity as a result of the Resiliency Project. Minor odors from the use of equipment during construction activities will be intermittent and temporary and will dissipate rapidly from the source with an increase in distance. Temporary increase in fugitive dust may occur during construction and earth moving activities. However, the Resiliency Project will implement Mitigation Measure AQ-1 which requires BMP measures to reduce potential impacts related to fugitive dust. See Attachment 4, CEQA ISMND Section 3.3 Air Quality for more information related to air quality impacts and full text of the mitigation measure.

26.Change in ocean, bay, lake, stream or ground water quality or quantity, or alteration of existing drainage patterns.

The Palco Marsh activities, and the Resiliency Project, will provide improved water quality and drainage efficiency and capacity. The Resiliency Project will reduce flooding through increased conveyance of the storm drain network by increasing the size of select storm drain pipes and implementing a new storm drain pipe alignment. The drainage patterns in Palco Marsh will remain similar, yet improved to more closely match natural tidal hydraulics, increase stormwater discharge capacity, and improve hydraulic control of the exchange between Palco Marsh and Humboldt Bay to offset increases in stormwater conveyance to Palco Marsh. The new channel would increase the stormwater conveyance capacity and efficiency from the outfall structure to the crossing between Palco Marsh and Humboldt Bay during storm events, increase the available tidal range and aquatic habitat within Palco Marsh, and provide a self-maintaining channel for ebb and flood tides to move through the northern extent of Palco Marsh more regularly and efficiently. The existing crossing between Palco

Marsh and Humboldt Bay conveys stormwater from Palco Marsh to Humboldt Bay, as well as ebb and flood tides in both directions. This conveyance structure will be replaced with a larger, similar structure with vertically adjustable tide gates to allow muting of tidal exchange that can also be adjusted as sea levels rise to provide the City with the ability to maintain or expand salt marsh habitat within Palco Marsh and adjacent areas. See Attachment 4, CEQA ISMND Section 3.10 Hydrology and Attachment 5, Permit Support Memorandum for additional information on the hydraulic modeling completed to inform the Project design as well as overall Project benefits to existing drainage patterns.

27.Substantial change in existing noise or vibration levels in the vicinity.

A. During Construction

Construction of the Project will result in a temporary noise increase associated with the use of construction equipment for the Project. See Attachment 4, ISMND Section 3.14 Noise for a discussion of noise and ground-borne vibration impacts.

B. During Project Utilization

Operational activities associated with the Project include maintenance of storm water infrastructure. Noise at the Project Area during these activities would not measurably exceed the existing background noise levels because only infrequent vehicular access, minor repairs, and maintenance would be required.

28.Site on filled land or on slope of 10% or more.

No. The work conducted in Palco Marsh will not occur on land with a 10% slope or more.

29.Use of disposal or potentially hazardous materials, such as toxic substances, flammable or explosives.

Construction of the Project will include the transport and use of common hazardous materials inherent to the construction process, including petroleum products such as fuel and lubricants for construction equipment and vehicles, concrete curing compounds, and solvents for construction of Project improvements. These materials are commonly used during construction, are not acutely hazardous, and will be used in relatively small quantities. The established regulatory framework, BMPs, and requisite construction protocols provide appropriate risk mitigation and hazard protections, thus the Project would not create a significant hazard to the public or environment from hazardous materials. See Attachment 4 CEQA ISMND, Section 3.9 Hazards and Hazardous Materials for a discussion on hazardous material use during construction.

The Hazardous Materials Corridor Study (SHN 2021) and Phase II Environmental Site Assessment (SHN 2022) identified existing (active) and historical (inactive) sites in proximity to the Project Area associated with contaminants present in soil and/or groundwater (Project Phase I and II Reports are available upon request). Given the proximity of these potentially contaminated sites, the Project construction has the potential to disturb remnant contaminants in soil and/or groundwater. Therefore, Mitigation Measure HAZ-1 (Prepare Soil Plan, Implement Phase II ESA Recommendations) was proposed in the CEQA ISMND to address and mitigate for the potential presence of and exposure to contaminants in soil and groundwater (Attachment 4, page 3-41). In addition to the Corridor Study and

Phase II, confirmation soil sampling was conducted in 2023 at five additional locations: three locations along West Del Norte Street and two locations within Palco Marsh. This information informed the Soil and Groundwater Management Plan (SGMP) which provides a detailed description of soil sampling, sampling results, and updates to the Phase II recommendations referenced in Mitigation Measure HAZ-1. The SGMP establishes appropriate protections, including material handling, storage, disposal and dust control measures for workers and the environment with respect to contaminated soil and/or groundwater exposure. The SGMP includes protocols for encountering unexpected, contaminated groundwater or soils. This includes monitoring during excavation using a photo ionization detector (PID) in addition to visual observation and olfactory observations. See Attachment 6 SGMP for details.

30.Substantial change in demand for municipal services (police, fire, water, sewage, etc.)

No. The Project improvements will not induce population growth and will not result in the need to increase staffing, create new hazardous conditions, or result in a modification to the road system that would restrict access for emergency services. See Attachment 4, CEQA ISMND Section 3.15 Public Services.

31.Substantially increase fossil fuel consumption (electricity, oil, natural gas, etc.).

No. Construction will require the use of fuels, primarily gas, diesel, and motor oil. Inefficient construction-related operations will also be avoided due to the measures in Mitigation Measure AQ-1 (BMPs to Reduce Air Pollution). See Attachment 4, CEQA ISMND Section 3.3 Air Quality and Section 3.6 Energy Resources.

32.Relationship to larger project or series of projects

The activities conducted within Palco Marsh are part of the Eureka Flood Reduction and Sea Level Rise Resiliency Project to provide much needed improvements to the community's drainage infrastructure to reduce current and future flooding. The Resiliency Project was first identified in the Eureka Area Watersheds Storm Water Resources Plan (EAWSWRP), a multi-jurisdiction plan to develop multi-benefit (water quality, water supply, flood management, environmental, and community parameters) stormwater projects.

ENVIRONMENTAL SETTING:

33.Describe the project site as it exists before the project including information on topography, soil stability, plants and animals, and any cultural, historical, or scenic aspects. Describe any existing structures on the site and the use of the structures. Attach photographs of the site. Snapshots or polaroid photos will be accepted.

Project activities would occur within and adjacent to Palco Marsh located south of the western extent of Del Norte Street. Palco Marsh is generally flat and provides coastal salt marsh habitat to waterfowl and aquatic species, the adjacent tidal inlet which provides moderate aquatic habitat for fish and other aquatic species, and the remaining wetlands. Humboldt Bay is situated to the west of the Project.

Due to the surrounding development and high intensity uses, the Project Area does not provide suitable habitat for special status mammals, including bats, and none were observed during reconnaissance level surveys or technical surveys. One special status plant species, Point Reyes bird's-beak, was observed during floristic surveys. Although no construction is proposed in this area, ISMND Mitigation Measure BIO-1 (Pre-construction Survey for Point Reyes bird's-beak), would ensure avoidance. Northern Red-legged Frogs and migratory birds could also occur in the Project Area. Mitigation Measure BIO-2 (Protect Special Status, Migratory and Nesting Birds) and Mitigation Measure BIO-3 (Protect Special Status Amphibians) are proposed to avoid impacts. In 2022, eDNA sampling was conducted by Ross Taylor & Associates and Cal Poly Humboldt that indicates the absence of Coho Salmon, Chinook Salmon, steelhead and Tidewater Goby (Attachment 4 ISMND: Attachment C BRE Appendix H). Regular presence of ESA- or CESA-listed species is not expected within the tidal channels, as water levels draw down considerably during low tide to expose the mudflat or channel bottoms with small, shallow, isolated pools. Although it is unlikely that aquatic species would be within Palco Marsh, Clark Slough or the tidal inlet, Project construction would include dewatering of Palco Marsh and Clark Slough, and construction activities adjacent to Palco Marsh, Clark Slough and Humboldt Bay; therefore, Mitigation Measure BIO-4 (Protection of Special Status Aquatic Species and Aquatic Habitat) is proposed to reduce potential impacts. Mitigation Measure BIO-5 (Mitigate for Impacts to Aquatic Resources) discusses the approach to mitigation to be taken to offset permanent impacts to aquatic resources. Attachment 4 includes the ISMND Appendices, which include detailed reports on biological resources.

Portions of the Project that are aboveground will generally match the ground elevation and therefore will not block views of Humboldt Bay from the shoreline. Segments of the North Western Pacific Railroad (ineligible for the National Register of Historic Places and the California Register of Historical Resources) also cross through the western Project Area; the Project will replace the inverted siphon under the railroad. The Project will not modify existing public access via the waterfront trail located just east of the railroad and west of Palco Marsh. The Project Area is included in the mapped FEMA 100-year flood zone. Archaeological resources were not identified, however inadvertent discovery and cultural monitoring mitigation will occur as described in Mitigation Measures CR-1, CR-2 and CR-3 of the CEQA document (Attachment 4).

Project Area Photos

Image 1: View facing southwest, Palco Marsh tidal channel to the west of the railroad.

Image 2: View facing southwest, tidal channel outlet to Humboldt Bay.

Image 3: View facing south from Del Norte Street; Palco Marsh and waterfront trail.

Image 4: View facing east from the waterfront trail towards Palco Marsh.

Image 5: View facing northwest, staging area north of Del Norte Street.

34.Describe the surrounding properties, including information on plants and animals and any cultural, historical, or scenic aspects. Indicate the type of land use (residential, commercial, etc.) intensity of land use (one-family, apartment houses, shops, department stores, etc.) and the scale of development (height, frontage, set-back, rear yard, etc.) Attach photographs of the vicinity. Snapshots or polaroid photos will be accepted.

High intensity industrial, commercial, and residential uses and associated roadways are to the north and east of the Project Area. Humboldt Bay is situated to the west of the Project. The marsh complex continues to the south. Marginal habitat is present that would support some species along the northern end of Palco Marsh (just east of the Del Norte Street Pier) and within the tidal channel south of the Del Norte Street Pier. Generally, existing surrounding habitat is expected to support only the most urban adapted species.

Surrounding Area Photos

Image 6: View facing west, entrance to the Del Norte Street Pier.

Image 7: View facing east, Del Norte Street.

Image 8: View facing northwest, the corner of Hawthorn Street and Felt Street.

---------------------- Questions 35; 36 and 39 MUST BE ANSWERED! ------------------

35.How will the proposed use or activity promote the public health, safety, comfort, and convenience?

Many portions of the City's existing storm water system are old and undersized, resulting in significant flooding, which is being exacerbated by sea level rise. Although the impacts propagate to upstream portions of the system, the low-lying areas of the City experience the most flooding. With the potential effects of rising sea levels and increased precipitation intensities, the City is susceptible to similar or more severe flooding at more frequent intervals.

The Resiliency Project addresses these issues by reducing peak flows, increasing the storm water system's capacity, and managing flows through tide and flap gates. The Project would result in significant flood reduction and increased resilience to climate change. Peak flows for small storm events would be reduced by providing infiltration in rain gardens or other LID features where feasible. Infiltration features are considered infeasible in many areas within the Project Area boundary due to high groundwater levels and poorly draining soils. Upsized and new storm mains will increase the system's capacity resulting in significantly reduced flooding in the streets and buildings thereby protecting human safety and reducing potential economic damage to the already disadvantaged community. New storm drain inlets would be installed to reduce flooding on the streets and convey the storm water within the storm water system. Tide and flap gates would increase the City's resiliency by protecting the storm water system from being overwhelmed by tidal surges.

36.How is the requested grant, permit, franchise, lease, right, or privilege required by the public convenience and necessity?

It is a necessity for the City of Eureka to reduce chronic flooding by having properly functioning drainage infrastructure.

37.Financial statement:

A. Estimated cost of the project.

The Palco Marsh activities are estimated to cost $1million. The total estimated cost of the Eureka Flood Reduction and Sea Level Rise Resiliency Project is $7million.

B. How will the project be financed.

The Project is funded through a FEMA Hazard Mitigation Grant Program, a CNRA Urban Flood Protection Grant, and a DWR Coastal Flood Reduction Grant.

38.Describe fully directions necessary to arrive at project site.

Palso Marsh can be accessed off Highway 101 on W Del Norte St near the cross section of Railroad Ave.

39.Will the Applicant agree that as a condition of the permit being issued to Applicant, to indemnify and hold harmless the Humboldt Bay, Harbor Recreation and Conservation District from any and all claims, demands, or liabilities for attorneys' fees obtained from or against demands for attorney's fees, costs of suit, and costs of administrative records made against District by any and all third parties as a result of third party environmental actions against District arising out of the subject matter of this application and permit, including, but not limited to, attorney's fees, costs of suit, and costs of administrative records obtained by or awarded to third parties pursuant to the California Code of Civil Procedure Section

1021.5 or any other applicable local, state, or federal laws, whether such attorneys' fees, costs of suit, and costs of administrative records are direct or indirect, or incurred in the compromise, attempted compromise, trial, appeal, or arbitration of claims for attorneys' fees and costs of administrative records in connection with the subject matter of this application and permit?

Yes.

NOTE

The District hereby advises the Applicant that, under California Public Resources Code Section 21089, the District when a lead agency under the Environmental Quality Act of 1970, as amended, pertaining to an Environmental Impact Report (EIR) or a Negative Declaration may charge and collect from the Applicant a reasonable fee in order to recover the estimated costs incurred by the District in preparing an Environmental Impact Report (EIR) or Negative Declaration for the project and the procedures necessary to comply with the provisions of the public resources code on the Applicants project. In the event your project contains an analysis of issues pertaining to the Environmental Quality Act of 1970, as amended, for which District staff is not competent to independently review, or District requires the same in preparation of an Environmental Impact Report (EIR) or Negative Declaration for the project, the District may retain a reviewing consultant to evaluate the content of the Administrative-Draft EIR and Final EIR or Negative Declaration with respect to these issues. The cost of such reviewing consultant services shall be borne by the Applicant.

CERTIFICATION: I hereby certify that he statements furnished above and in the attached exhibits present the data and information required for this initial evaluation to the best of my ability, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

Dated: 9/25/2023

For Brian Gerving, Director of Public Works

Attachments

Attachment 1

Project Addresses and Parcel Numbers

Map ID	APN	Owner Name	Address
1	00308219	P W M Inc	5000 Valleystone Dr #200, Cary, NC 27519
2	00308222	Northwestern Pacific Railroad Co (operated by Great Redwood Trail Agency/North Coast Rail Authority)	419 Talmage Rd., Suite M, Ukiah, CA 95482
3	00308216	Bmd Eureka Co	325 Elm Ave, Galt, CA 95632
4	00703104	Eureka City Of	531 K St, Eureka, CA 95501
5	00703102	Northwestern Pacific Railroad Co (operated by Great Redwood Trail Agency/North Coast Rail Authority)	419 Talmage Rd., Suite M, Ukiah, CA 95482
6	00703103	Eureka City Of	531 K St, Eureka, CA 95501
7	00319103	North Coast Mercantile Co Inc	1115 W Del Norte St, Eureka, CA 95501
8	00319107	Humboldt Waste Management Authority	1059 W Hawthorne St, Eureka, CA 95501
9	00705102	Northwestern Pacific Railroad Co (operated by Great Redwood Trail Agency/North Coast Rail Authority)	419 Talmage Rd., Suite M, Ukiah, CA 95482
10	00704103	Eureka City Of	531 K St, Eureka, CA 95501
11	00702105	Humboldt Waste Management Authority	P O Box 5777, Eureka, CA 95502

Paper Size ANSI A

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Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

GHD

City of Eureka
Flood Reduction and
Seal Level Rise Mitigation Project

Railroad Region
Land Ownership

Project No. 12566459
Revision No. -
Date Sep 2023

FIGURE 3.1

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Print date: 15 Sep 2023 - 05:54

Data source: World Imagery; Maxar, GHD. Created by: djones3

Attachment 2

Adjoining Property Owners

Adjoining Property Owners, Names and Addresses

NAME	APN	ADDRESS	MAILING ADDRESS
PWM Inc	00308219	W Del Norte Street	5000 Valleystone Dr #200, Cary, NC 27519
North Coast Mercantile Co Inc	00319103	W Del Norte St	1115 W Del Norte St Eureka, CA 95501
Humboldt Waste Management Authority	00319107	W Hawthorne St	1059 W Hawthorne St Eureka, CA 95501
Redwood Region Audubon Society	Palco Marsh Open Space Easement	141 G Street Arcata, CA 95521	PO Box 1054 Eureka, CA 95502

Attachment 3

Permits and Other Public Approvals

Permits & Approvals

City of Eureka Conditional Use Permit	(CUP-23-0004) Approved August 14, 2023
City of Eureka Coastal Development Permit	(CDP-23-0008) Approved August 14, 2023
Coastal Development Permit Amendment	Application submitted - pending
CEQA Initial Study /Mitigated Negative Declaration	SCH#: 2023060362 Approved August 14, 2023
Great Redwood Trail Agency (North Coast Rail Authority) Encroachment Permit	Not submitted, pending
Caltrans Encroachment Permit	Not submitted, pending
North Coast Regional Water Quality Control Board (Regional Board) under CWA Section 401 Water Quality Certification	Application submitted - pending
U.S. Army Corps of Engineering (USACE) Clean Water Act (CWA) Section 404	Application submitted - pending

Attachment 4

Public Circulation CEQA Initial Study /Mitigated Negative Declaration

Eureka Flood Reduction and Sea Level Rise Resiliency Project

Public Circulation Initial Study/Proposed Mitigated Negative Declaration

City of Eureka

June 1, 2023

Eureka Flood Reduction and Sea Level Rise Resiliency Project

Public Circulation Initial Study/Proposed Mitigated Negative Declaration (ISMND)

This document has been prepared for:

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June 1, 2023

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1. Project Information

Project Title	Eureka Flood Reduction and Sea Level Rise Resiliency Project
Lead Agency Name & Address	City of Eureka, Public Works Department 531 K Street Eureka, CA 95501
Contact Person & Phone Number	Jesse Willor (707) 441-4194 jwillor@ci.eureka.ca.gov
Project Location	In various street segments of Eureka, CA including: Del Norte St. between B St. and the Del Norte Pier; Short St. between 15th St. and Wabash Ave.; Koster St. between Washington St. and 14th St.; Hawthorne St. between Union St. and California St.; California St. between Hawthorne St. and Trinity St.; Williams St. between Long St. and Buhne St.; Long St. between Williams St. and D St.; intersection of Sonoma St. and California St.; 14th St. and Eureka Waterfront Trail; the northern terminus of Commercial St.; Clark Slough at Koster St. and Washington St.; and the Palco Marsh from Railroad Ave. to the existing Bay outfall.
General Plan Land Use Designation	HDR High Density Residential MDR Medium Density Residential LDR Low Density Residential GC General Commercial GI General Industrial LI Light Industrial CDI Coastal Dependent Industrial PO Professional Office PQP Public/Quasi-public NR Natural Resources
Zoning	MG General Industrial ML Limited Industrial MC Coastal Dependent Industrial CS Service Commercial (within coastal zone) PF Public Facilities SC Service Commercial OR Office Residential R3 Residential High R2 Residential Medium R1 Residential Low P Parks WD Water Development NR Natural Resources

1.1 CEQA Requirements

The City of Eureka (City), serving as the California Environmental Quality Act (CEQA) Lead Agency, has prepared this Initial Study to provide the public, responsible agencies, and trustee agencies with information about the potential environmental effects of the proposed Flood Reduction and Sea Level Rise Mitigation Project (hereafter referred to as the “Project”). The Project as proposed would provide flood reduction and sea level rise resiliency through the replacement of undersized storm drain piping and culverts, installation of tide gates and Low Impact Development (LID) features, and limited earthwork within Palco Marsh to increase stormwater storage capacity. The Project would also include the installation of trash capture devices (TCDs) to reduce the amount of pollution that could potentially enter Humboldt Bay.

The purpose of this Initial Study is to provide a basis for deciding whether to prepare an Environmental Impact Report, a Mitigated Negative Declaration, or a Negative Declaration. This Initial Study is intended to satisfy the requirements of CEQA (Public Resources Code [PRC], Div 13, Sec 21000-21177), and the State CEQA Guidelines (California Code of Regulations, Title 14, Sec 15000-15387). Section 15063(d) of the State CEQA Guidelines states the content requirements of an Initial Study as follows:

1. A description of the project including the location of the project;
2. An identification of the environmental setting;
3. An identification of environmental effects by use of a checklist, matrix, or other method, provided that entries on a checklist or other form are briefly explained to indicate that there is some evidence to support the entries;
4. A discussion of the ways to mitigate the significant effects identified, if any;
5. An examination of whether the project would be consistent with existing zoning, plans, and other applicable land use controls; and
6. The name of the person or persons who prepared or participated in the Initial Study.

1.2 Purpose and Need

Many portions of the City's existing storm water system are old and undersized, resulting in significant flooding, which is being exacerbated by sea level rise. Although the impacts propagate to upstream portions of the system, the low-lying areas of the City experience the most flooding. Approximately one foot of flooding was witnessed on Washington Street during November 2012, when the area experienced high rainfall coinciding with high tides, which prevented the system from draining. Similar flooding was observed in January 2019. With the potential effects of rising sea levels and increased precipitation intensities, the City is susceptible to similar or more severe flooding at more frequent intervals.

The Eureka Flood Reduction and Sea Level Rise Resiliency Project addresses these issues by reducing peak flows, increasing the storm water system’s capacity, and managing flows through tide and flap gates. The Project would result in significant flood reduction and increased resilience to climate change. Peak flows for small storm events would be reduced by providing infiltration in rain gardens or other LID features where feasible. Infiltration features are considered infeasible in many areas within the Project Area boundary due to high groundwater levels and poorly draining soils. Upsized and new storm mains will increase the system’s capacity resulting in significantly reduced flooding in the streets and buildings thereby protecting human safety and reducing potential economic damage to the already disadvantaged community. New storm drain inlets would be installed to reduce flooding on the streets and convey the storm water within the storm water system. Tide and flap gates would increase the City’s resiliency by protecting the storm water system from being overwhelmed by tidal surges.

1.3 Project Summary

The City of Eureka proposes the Eureka Flood Reduction and Sea Level Rise Resiliency Project (Project) within urbanized coastal areas to reduce flooding, increase sea level rise resiliency, and improve water quality in Humboldt Bay. The Project would increase the storage capacity and conveyance of the storm drain network, implement flow attenuation and water quality improvements, reduce trash conveyance into waterways, and enhance tidal circulation to provide flood reduction and sea level rise resiliency. Project locations are shown in Figure 1 and Project components in Figure 2.1 to 2.10. Increased storage capacity and conveyance would be achieved by replacing undersized storm drain pipes with larger diameter pipes, installation of tide gates at strategic locations within the system, and construction of a new storm drain pipe alignment. Flow attenuation and water quality improvements would be accomplished with LID features (e.g., rain gardens) and trash capture devices. Rain gardens would be placed along or upstream of storm drain improvements, and trash capture devices would be installed in key locations along the storm drain alignments. Water quality benefits would be achieved by reducing peak flows and runoff volumes that can cause erosion and carry sediment to Humboldt Bay. The LID features would provide additional pollutant removal from urban runoff via the increased holding time, contact with vegetation, and percolation of runoff into soil. The trash capture devices (TCDs) would also reduce pollutants entering Humboldt Bay and assist the City in meeting their MS4 requirements. Enhancements to the existing muted tidal system at Palco Marsh include channel excavation and replacement of the existing hydraulic conveyance structure between the marsh and Humboldt Bay with larger capacity culverts and adjustable flap gates. The new culverts would increase the lower tidal range, match existing tidal inundation duration, store peak water levels within the marsh area and avoid offsite flooding, enhance sediment exchange from the Bay to Palco Marsh, reduce velocities within the crossing, and enhance sediment deposition on the marsh plain to promote adaptation of the marsh ecosystem to rising sea levels.

1.4 Project Location

The proposed Project is within the City of Eureka, California located in Humboldt County (see Figure 1 – Project Concept Location Map in Appendix A). Specifically, the majority of Project components are located within various street segments and intersections throughout the City by Project region as shown on Figure 2 – Project Concept, with details of Project elements shown in Figure 2.1 through Figure 2.10 (in Appendix A) and described below.

Stormwater Pipe Replacement

- Del Norte Street (St.) between B St. and the Eureka Waterfront Trail;
- Short St. between 15th St. and Wabash Ave.;
- Koster St. between Washington St. and 4th St.;
- Hawthorne St. between Union St. and California St.;
- California St. between Hawthorne St. and Trinity St.;
- Williams St. between Long St. and Buhne St.;
- Long St. between Williams St. and D St.;

Low Impact Development Installation

- Del Norte St. and California St.;
- Sonoma St. and California St.

Trash Capture Device Installation

- Washington and Koster St.;
- 14th St. and Eureka Waterfront Trail

Tide Gate Installation

- Koster St. and Cedar St.
- Commercial St. and Waterfront Dr. (replacement of existing tide gate)
- Del Norte St. at Palco Marsh
- Palco Marsh at Humboldt Bay (adjustable to maintain existing tidal exchange)

Improvements to Palco Marsh would occur in Palco Marsh located south of the western extent of Del Norte Street. The Project Area is bordered by residential, industrial, and open space uses. Portions of the Project Area are included in the mapped FEMA 100-year flood zone (Figure 3 – FEMA Flood Zones).

1.5 Project Elements

1.5.1 Storm Drain Network

Proposed storm drain improvements include:

- Replacement of approximately 3,200 lineal feet of existing storm drainpipe with larger capacity pipes ranging from 18 to 36-inches in diameter

- Installation of approximately 3,700 lineal feet of new storm drainpipe ranging from 36 to 60-inch diameter and boxes ranging from 8-foot by 3 to 4-foot
- New storm drain manholes and junction boxes

Excavation for the replacement of pipes typically varies from 3 to 8 feet below the ground surface and 4 to 12 feet wide. Excavation for new pipes varies from 8 to 13 feet below ground surface and 6 to 14 feet wide. Excavation for new manholes and junction boxes follow similar excavation depths and width based on association with replacement of existing pipes or new pipes. Storm drain features will typically be located within the existing paved roadway or previously disturbed areas and will utilize existing outfall locations.

1.5.2 Koster and 14th Street

A larger capacity connection between the existing 60-inch pipe on Koster Street and 7 feet by 5 feet box culvert on 14th Street is proposed to reduce flooding on the north end of Koster Street (Figure 2.1). Enlarging the connection will allow more stormwater to flow west along 14th street to Humboldt Bay, reducing backflow along the Koster Street pipe during storm events. The 14th and Koster Intersection has a rim elevation of 9.2 feet, and an invert depth of 9.6 feet to the 60-inch pipe.

1.5.3 Short Street Storm Drains

The proposed pipe upgrades for Short Street would run south from West 15th Street to West Wabash Street (see Figure 2.2). Proposed pipe upgrades include the replacement of existing 15-inch reinforced concrete pipe with 18-inch HDPE from West 15th to West Wabash Street, then with 24 inch HDPE pipe under West Wabash Street itself (Exhibit 1-1). The typical invert depth of the pipes is 4.8 feet, ranging from 5.1 feet to 4.6 feet depending on location (Table 1.5-1). There would be approximately 3 feet of cover for pipes beneath Short Street.

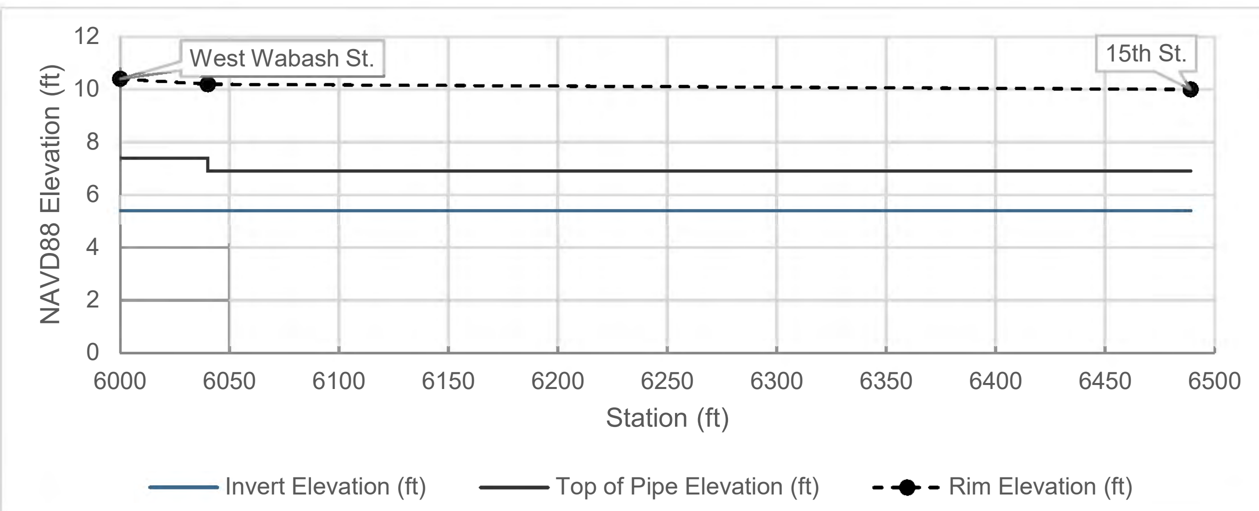

Exhibit 1-1 Rim Elevation, Invert Elevation and Top of Pipe Elevation for Short Street Storm drainpipes.

Table 1.5-1 Summary of Short Street Storm Drain upgrade depths.

Intersection	Pipe Size (in)	Rim Elevation (ft)	Invert Elevation (ft)	Invert Depth (ft)
West Wabash St	24	10.4	5.4	5
West Wabash St	18	10.2	5.4	4.8
15th St	18	10	5.4	4.6

1.5.4 Del Norte Street Storm Drains

The upstream extent of storm drain improvements along Del Norte Street are located at the intersection of West Del Norte and B Street and the downstream extent is located approximately 4,300 feet west to existing Del Norte Street outfall location into Palco Marsh (see Figure 2.3 to Figure 2.5). The pipe upgrades would upsize the existing section of 30-inch diameter pipe with 36-inch and install new storm drain pipe ranging from 36 to 60-inch pipe between B street and Broadway then transition to an 8 foot wide by 3 foot tall box (or three parallel 36-inch diameter pipes) from Broadway to Railroad Avenue and 8 foot wide by 4 foot tall box (or three parallel 42- to 48-inch diameter pipes) downstream of the confluence with the existing 42-inch pipe to the outfall in Palco Marsh (Exhibit 1-2). The existing 30-inch storm drain pipe that conveys flow north on A Street will be plugged to only convey flow west along the new alignment. The typical invert depth (depth from ground surface to flow line of pipe) for the pipes is approximately 8 feet but ranges from 4.3 feet to 20 feet depending on the location (Table 1.5-2). Trench depth would be up to 1 foot deeper than the invert depth to accommodate the thickness of the pipe and typical 6-inch thick bedding per the City's standard detail. Typical pipe installation requires shoring if deeper than 4 to 5 feet deep. Installation of pipe between Fairfield to Union Streets will likely be installed by trenchless methods, such as horizontal auger, due to required installation depth. Installation within the Caltrans right-of-way would either be by open trench or trenchless.

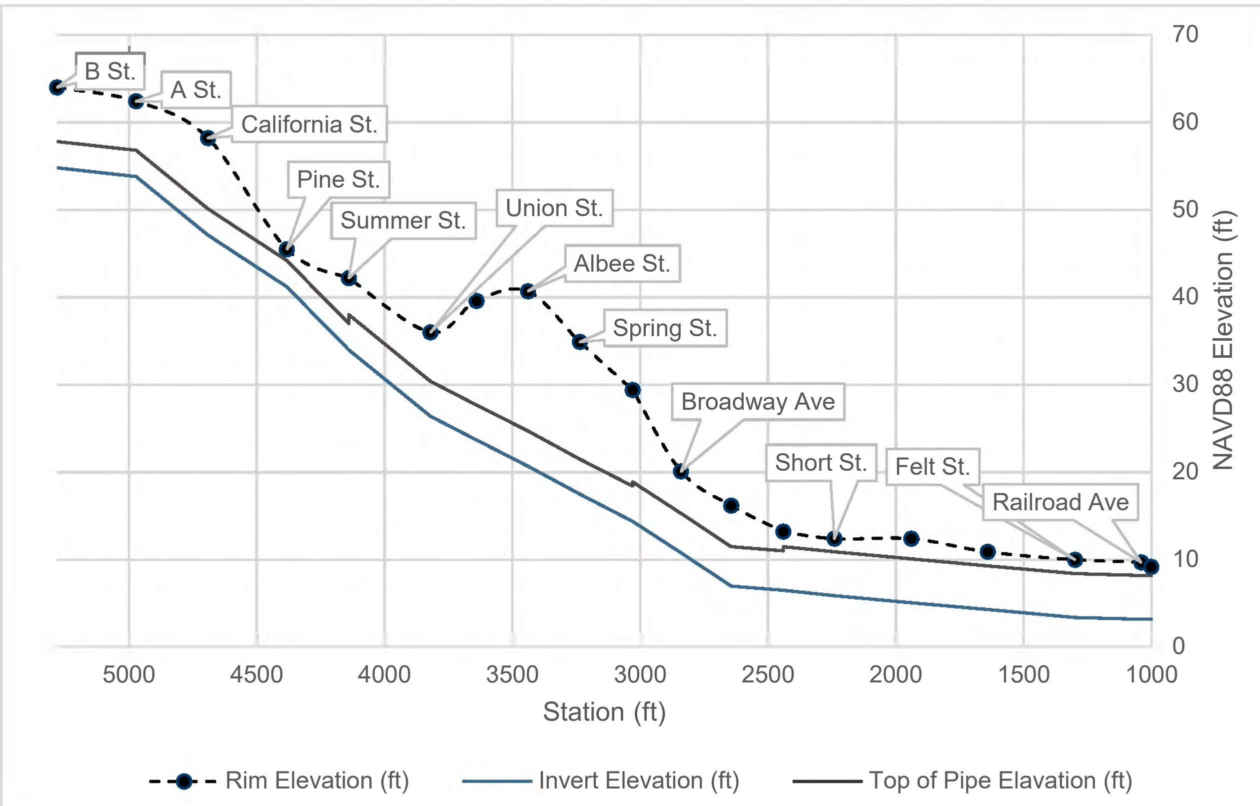

Exhibit 1-2 ***Rim Elevation, Invert Elevation and Top of Pipe Elevation for Del Norte Street Storm drainpipes***

Table 1.5-2 ***Summary of Del Norte Street Storm Drain upgrades***

Key locations	Intersection	Pipe Size (in)	Rim Elevation (ft)	Invert Elevation (ft)	Invert Depth (ft)
Min depth	Pine St	36	45.5	41.2	4.3
Typical depth	Summer St	36	42.2	34	8.2
Max depth	Albee St	48	40.7	20.7	20

1.5.5 Existing Utility Relocation

The existing 6-inch diameter vitrified clay sewer pipe and associated manholes along Del Norte Street, between Broadway and Railroad Avenue would be relocated to the north to accommodate the proposed storm drain box culvert. Sewer and water laterals would be relocated or extended to accommodate the relocation of the sewer line and installation of the storm drain box culvert.

1.5.6 California and Hawthorne Street Storm Drains

The storm drain upgrades for California and Hawthorne Streets would begin at the intersection of California and Trinity Streets (see Figure 2.6). From there, the pipes run north to the intersection of California and Hawthorne Streets, and turn west and continues to the intersection of Hawthorne and Union Streets where it connects with the existing storm drain network. The existing 24-inch concrete pipes would be replaced with 30-inch HDPE pipe on California Street and Hawthorne Street (Exhibit 1-3). The typical invert depth of the pipes is approximately 6 feet, ranging from 3.8 feet to 8.2 feet (Table 1.5-3). The minimum cover for the pipe upgrades is 1.3 feet at Pine Street, with a typical cover of 3.5 feet for the upgrade area.

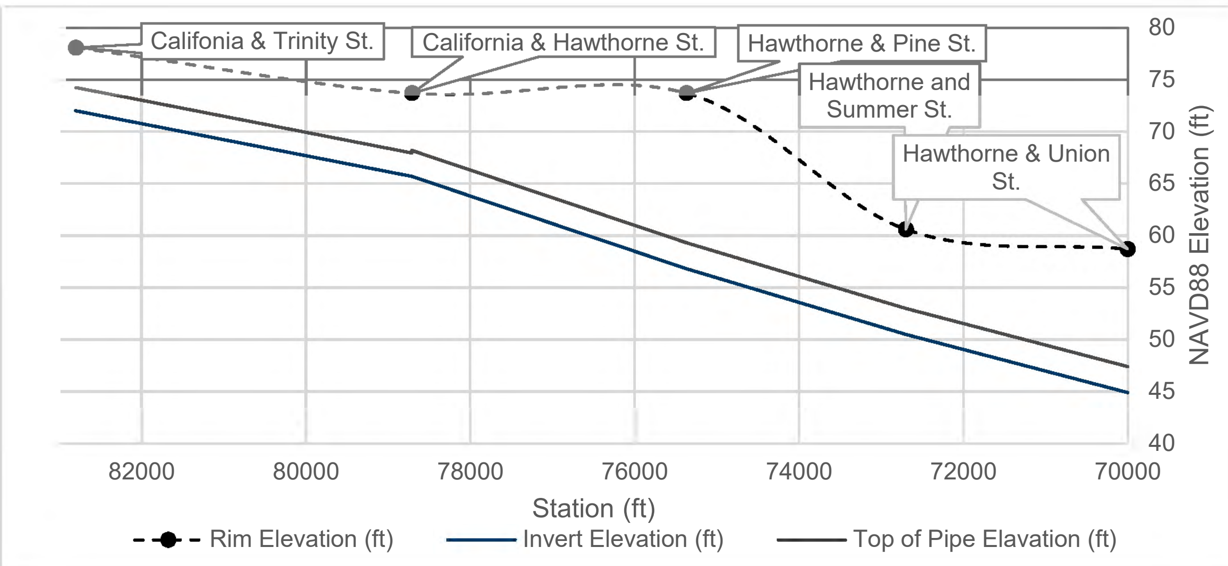

Exhibit 1-3 Rim Elevation, Invert Elevation and Top of Pipe Elevation for California and Hawthorne Streets Storm Drainpipes

Table 1.5-3 Summary of Hawthorne and California Street Storm Drain upgrades.

Key locations	Intersection	Pipe Size (in)	Rim Elevation (ft)	Invert Elevation (ft)	Invert Depth (ft)
Min depth	California and Trinity St	30	60.6	56.8	3.8
Typical depth	California and Hawthorne St	30	78.1	72	6.1
Max depth	Hawthorne and Pine St	30	58.7	50.5	8.2

1.5.7 Williams and Long St Storm Drains

The Long and Williams Streets proposed pipe upsizing starts at the intersection of D and Long Street and runs west to the intersection of Long and Williams Street, then north on Williams to the intersection of Buhne Street where it connects with the existing storm drain network (see Figure 2.7). The upgrades would replace the existing 24-inch reinforced concrete pipe with 30-inch HDPE pipe (Exhibit 1-4). The typical invert depth for the pipes would be approximately 10 feet, ranging from 4.6 feet to 13 feet depending on location (Table 1.5-4). Minimum cover of the pipes would be approximately 1.5 feet at Buhne St, ranging from 2.9 to 6.9 feet for the upgrade area.

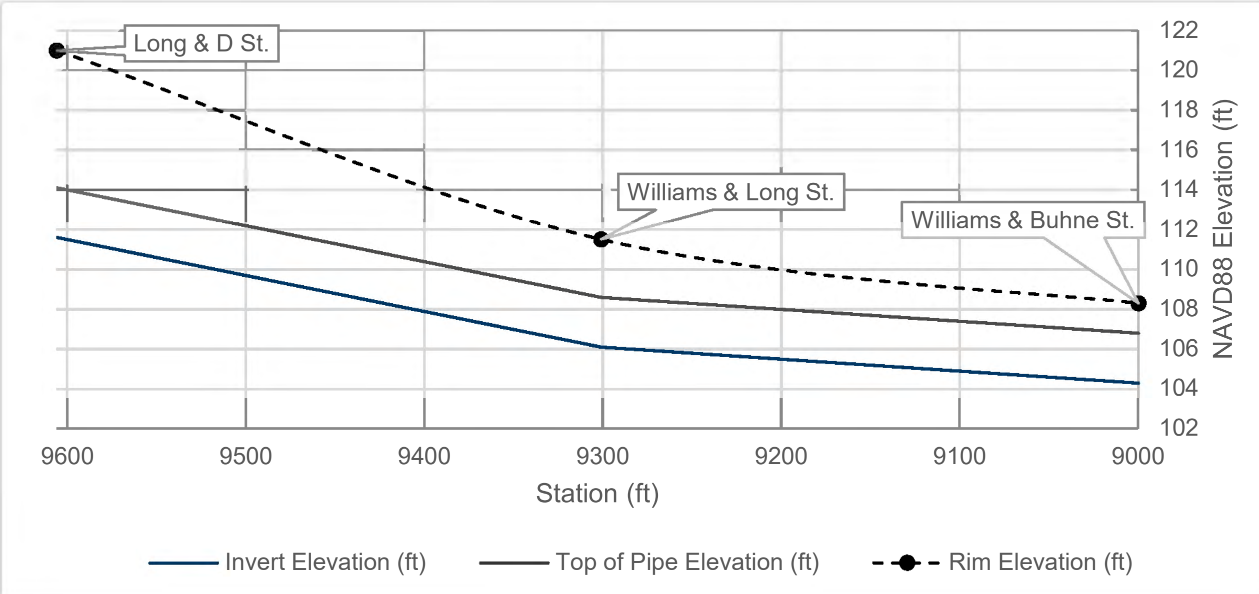

Exhibit 1-4 ***Rim Elevation, Invert Elevation and Top of Pipe Elevation for Long and Williams Streets Storm Drainpipes***

Table 1.5-4 ***Summary of Long and Williams Street Storm Drain Upgrade Depths***

Intersection	Pipe Size (in)	Rim Elevation (ft)	Invert Elevation (ft)	Invert Depth (ft)
Long & D St	30	121	111.6	9.4
Long & Williams St	30	111.5	106.1	5.4
Williams & Buhne St	30	108.3	104.3	4

1.6 Low Impact Development (LID)

LID features would be located within existing roadway and sidewalk right-of-way at the intersections of Del Norte and California Street, and California and Sonoma Street (see Figure 2.5). The LIDs would incorporate pedestrian visibility components. LID features typically extend approximately 8 to 10 feet from the existing curb into the parking lane and intersection. Excavation for LID feature installation would be up to five feet below ground surface and more typically less than three feet. LID features would be backfilled with soil and planted with vegetation.

1.6.1 Del Norte and California Street LID and Blended Transitions

LID features would be installed on the northeast, southeast and southwest corners of the California and Del Norte Streets intersection (Exhibit 1-5). Blended transitions would be installed on the northwest and northeast corners. LIDs would conform to exiting blended transitions and provide storage of runoff and overflow to existing flow paths (curb and gutter). Excavation of the existing road surface and sidewalk would be 3 to 5 feet deep to accommodate new curbs and planting media. The LID features would be planted with native plants that provide improvements in water quality to storm water flowing through the LID (i.e. slows the rate of runoff and increases contact with vegetation), and visual enhancement of the LID location.

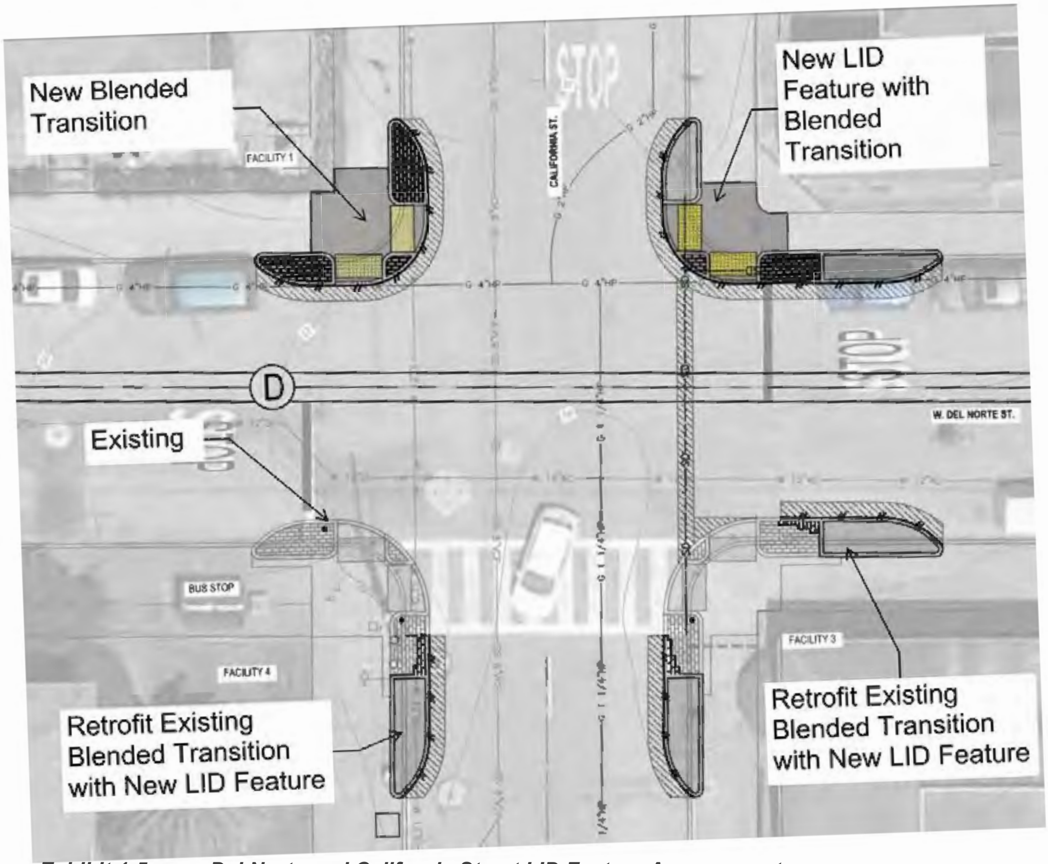

Exhibit 1-5 Del Norte and California Street LID Feature Arrangement

1.6.2 California and Sonoma Street LID and Blended Transitions

LID features and blended transitions would be installed on the northeast, southeast and southwest corners of the California and Sonoma Street intersection (see Exhibit 1-6). The LIDs would provide storage of runoff and overflow to existing flow paths (curb and gutter). Excavation of the existing road surface and sidewalk would be 3 to 5 feet to accommodate new curbs and planting media. The LID feature would be planted with native plants that provide improvements in water quality to storm water flowing through the LID due to increased holding time and percolation through the LID feature, and visual enhancement of the LID location.

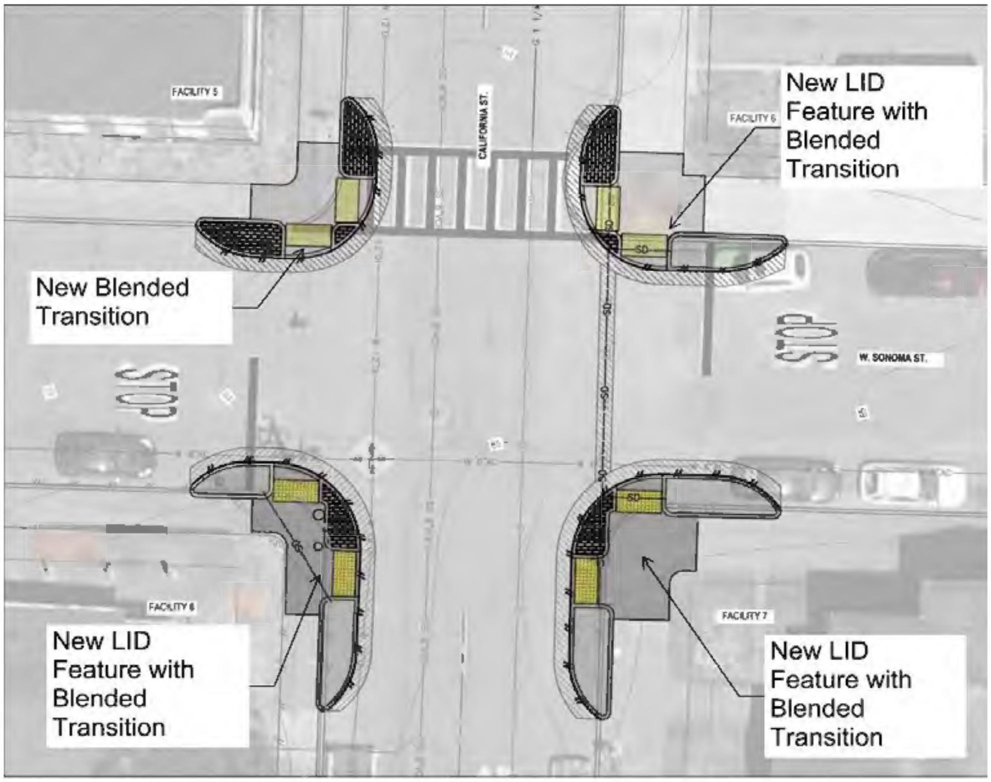

Exhibit 1-6 California and Sonoma Street LID Feature Arrangement

1.7 Trash Capture Devices

Trash Capture Devices (TCDs) collect debris carried by storm water runoff prior to entering receiving waters (Humboldt Bay) and are intended to meet the City's MS4 trash capture requirements. TCDs would be installed in four areas near the discharge point of stormdrain systems. TCDs vary in size and configuration depending on location and contributing flow. Two of the TCDs would be installed at the existing stormdrain outfall locations into Palco Marsh (Del Norte St and Railroad Ave) and Clark Slough (Washington and Koster Streets) and would consist of concrete headwalls, wingwalls and aprons located between the back of sidewalk and existing slough channels. Trash would be captured in debris nets as flow travels through the structure and access provided along the side of the structure. Tide gates would be placed on the Del Norte TCD to prevent tidal inflows from Palco Marsh. Two additional TCDs would be installed within paved areas, subsurface, within concrete vaults along the existing storm drain alignments (14th and Railroad Ave, and Commercial St and Waterfront Dr.) Trash would be captured in debris nets as flow travels through the structure and access provided via a hatch. Installation of TCDs, headwalls, wingwalls and aprons would require over excavation of 2 feet and extend 3 feet beyond the footprint of the structure, geotextile fabric placed and filled with aggregate for bedding. Following installation of the device and associated cast-in-place headwalls, wingwalls and aprons, the excavation would be backfilled with native materials or imported fill and compacted. Approximate dimensions and elevations of the devices are presented in Table 1.7-1.

Table 1.7-1 Summary of Trash Capture Device locations and sizing.

Location	Type	Footprint (ft x ft)	Rim or Top Elevation(ft)	Invert Elevation (ft)	Excavation Depth (ft)
14th and Railroad Ave.	Vault	6 x 14	10.4	2.3	10 - 13
Washington and Koster St.	Outfall	10 x 24	8.2	1.7	
Commercial St. and Waterfront Dr.	Vault	6 x 14	11.2	3.1	
Del Norte St. and Railroad Ave.	Outfall	25 x 36	9.0	2.7	

1.7.1 Location Specifics

The placement of each TCD and a general overview of site conditions at each proposed installation location is presented below. Access to each TCD would be provided via a manhole.

Commercial St. and Waterfront Dr. & 14th and Railroad Ave

The TCD located at Commercial Street and Waterfront Drive would be located within a subsurface vault under Commercial Street approximately 150 feet south of the outlet underneath a pier at Humboldt Bay (Figure 2.8). A tide gate within a concrete vault would be installed between the TCD and Humboldt Bay to limit potential tidal water from flowing into the storm drain system.

The TCD located at 14th Street and Railroad Avenue would be located subsurface to 14th Street immediately west of the intersection with Railroad Ave (Figure 2.9). An existing railroad track and grassy area is located adjacent (to the north) of the proposed subsurface TCD. A conceptual profile of the TCD is shown in Exhibit 1-7.

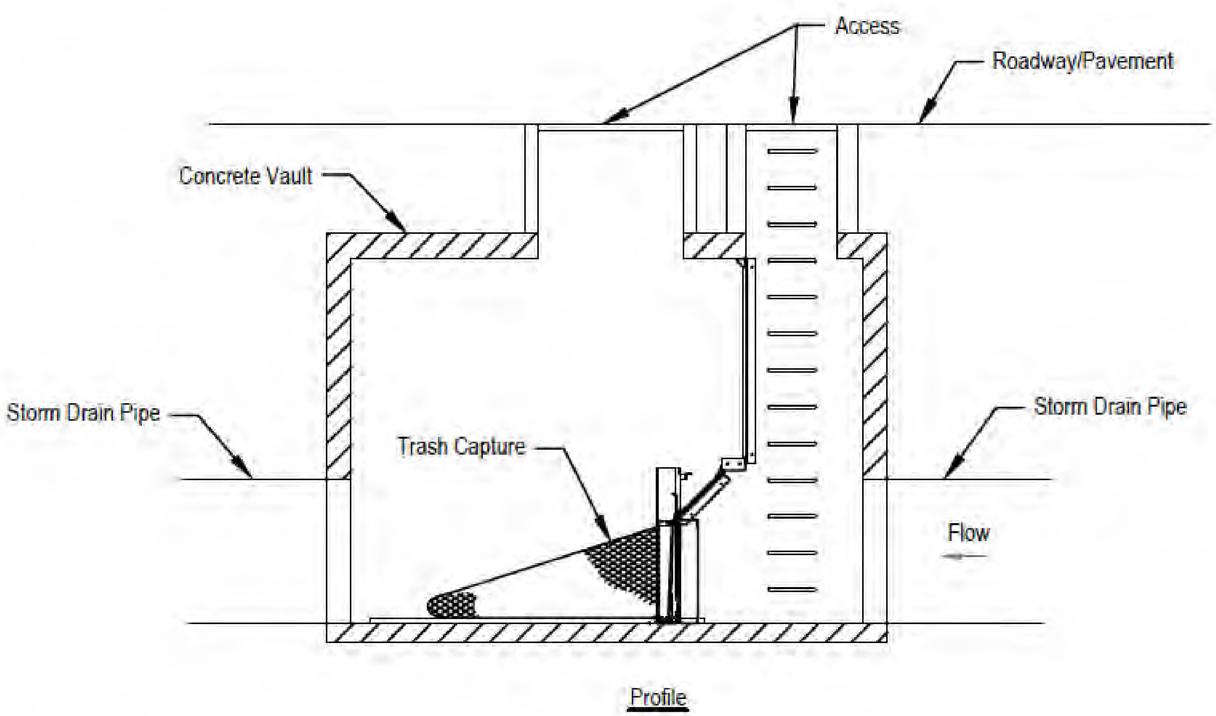

Exhibit 1-7 Below grade trash capture device.

Washington and Koster St.

This TCD would be located off the roadway to the north of the intersection (Figure 2.10). This TCD would filter stormwater before it outfalls into Clarke Slough, a rock-lined and vegetated channel (to the north), that drains into Humboldt Bay. This TCD would be at surface level, placed at the outfall to Clark Slough (Exhibit 1-8).

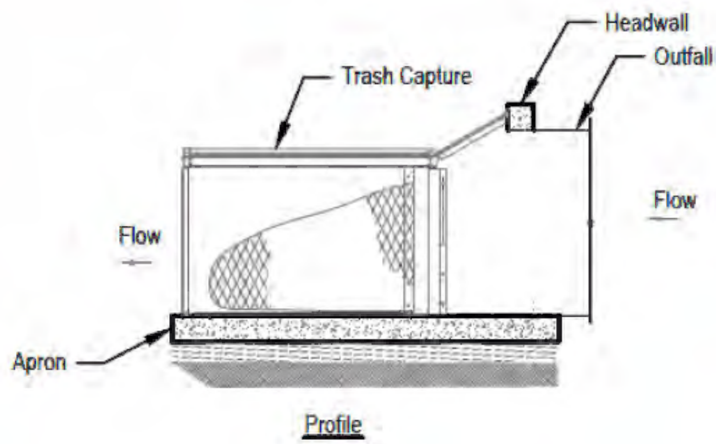

Exhibit 1-8 Trash capture device at Washington and Koster Street outfall

Del Norte St. and Railroad Ave.

The TCD located at the Del Norte Street and Railroad Avenue outfall would be located at the outfall into Palco Marsh (Figure 2.3). The TCD would connect to the proposed stormdrain pipes adjacent to Palco Marsh (Del Norte Outfall) (Exhibit 1-9). The TCD will also contain a tide gate.

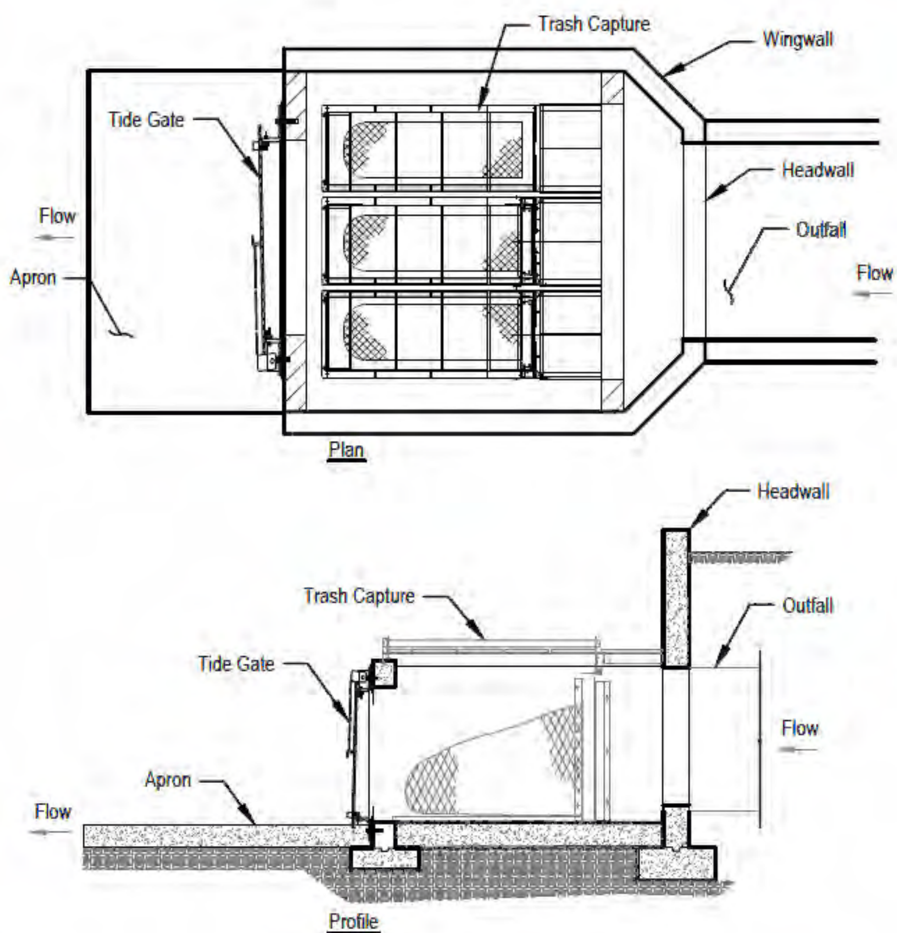

Exhibit 1-9 Trash capture device at Del Norte outfall

1.8 Palco Marsh

Activities within Palco Marsh include replacing the existing outfall structure with a new structure that contains a TCD and tide gate; excavation of approximately 350 feet of new channel in the northern extent of Palco Marsh to between elevation 2 ft to 2.5 ft; excavation of a tidal pond with a sill at Mean Tide Level (MTL)in an existing low elevation area; deepening 800 feet of existing channel ranging in flow line elevation 3 ft to 5 ft to a range of 1.5 ft to 2 ft; and placement of excavated soils in Palco Marsh in locations that have subsided and no longer exhibit marsh habitat (see Figure 2.3). The existing outfall structure will be removed and disposed. The existing stormdrain pipes from the existing structure to the channel between Palco Marsh and Del Norte Street Park no longer functions without routine excavation of the channel to remove accumulated sediment. These discharge pipes and outfall will either be removed and backfilled or abandoned in place.

Stormwater from Railroad Avenue and Del Norte Street would flow through the TCD located in the approximate location of the existing outfall structure within Palco Marsh and discharge into the proposed channel. The proposed channel is located in an existing brackish area of Palco Marsh where existing stormwater discharges and limited tidal inundation occurs, due to a lack of hydraulic connection to tidal channels. Existing stormwater channels within this area experience continual aggradation that diminished the conveyance of both stormwater and tidal water. Ground elevations in the area range from approximately 6.5 ft to 9 ft and typical spring tides within Palco Marsh are between elevation 3 ft and 6 ft, resulting in additional limitations to tidal inundation. The new channel would increase the stormwater conveyance capacity and efficiency from the outfall structure to the crossing between Palco Marsh and Humboldt Bay during storm events, increase the available tidal range and aquatic habitat, and provide a self-maintaining channel for ebb and flood tides to move through the northern extent of Palco Marsh more regularly and efficiently. New channel dimensions are based on the existing footprints and indications of historical tidal channel geometry, with a top width of up to 20 feet, side slopes of 2H:1V, and typically require 1.5 to 4 feet of excavation (Exhibit 1-10).

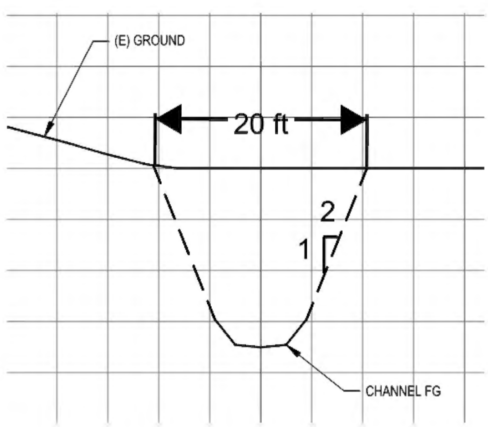

Exhibit 1-10 Typical new channel geometry in Palco Marsh

The existing crossing between Palco Marsh and Humboldt Bay conveys stormwater from Palco Marsh to Humboldt Bay, as well as ebb and flood tides in both directions. The tidal range within Palco Marsh is muted, typically between elevation 3 ft and 5.3 ft when water levels in Humboldt Bay range from 0 ft to 6.5 ft (Exhibit 1-11). The muted tidal range is due to the flow constriction created by a 48” diameter HDPE pipe that transitions to two 18” diameter pipes. The crossing configuration is known as an inverted siphon that is designed to use hydraulic head pressure on lower elevation sections of pipe (two 18’ diameter pipes) to convey flow up to a higher elevation section (48” diameter pipe) to avoid (go under) utilities that cross the alignment. This conveyance structure may be replaced with a larger, similar structure (4 24” lower elevation pipes and 2 48” pipes) to maintain avoidance of utility conflicts or replaced with two parallel 4 foot by 4 foot box culverts and relocation of the crossing utilities by direction drilling. Either configuration will include new concrete headwalls, wingwalls and aprons constructed on each side of the crossing. Tide gates mounted on rails for vertical adjustment would be located along the culvert alignments or on the outlet structure to allow for adjustable muting of tidal exchange and resulting water levels to maintain tidal inundation patterns that influence existing vegetative communities (Exhibit 1-11). Conveyance may be adjusted as sea levels rise to provide the City with the ability to maintain or expand salt marsh habitat within Palco Marsh and adjacent areas. Each pipe would allow bi-directional flow with tide gates limiting a portion of the flood tide to maintain tidal inundation patterns.

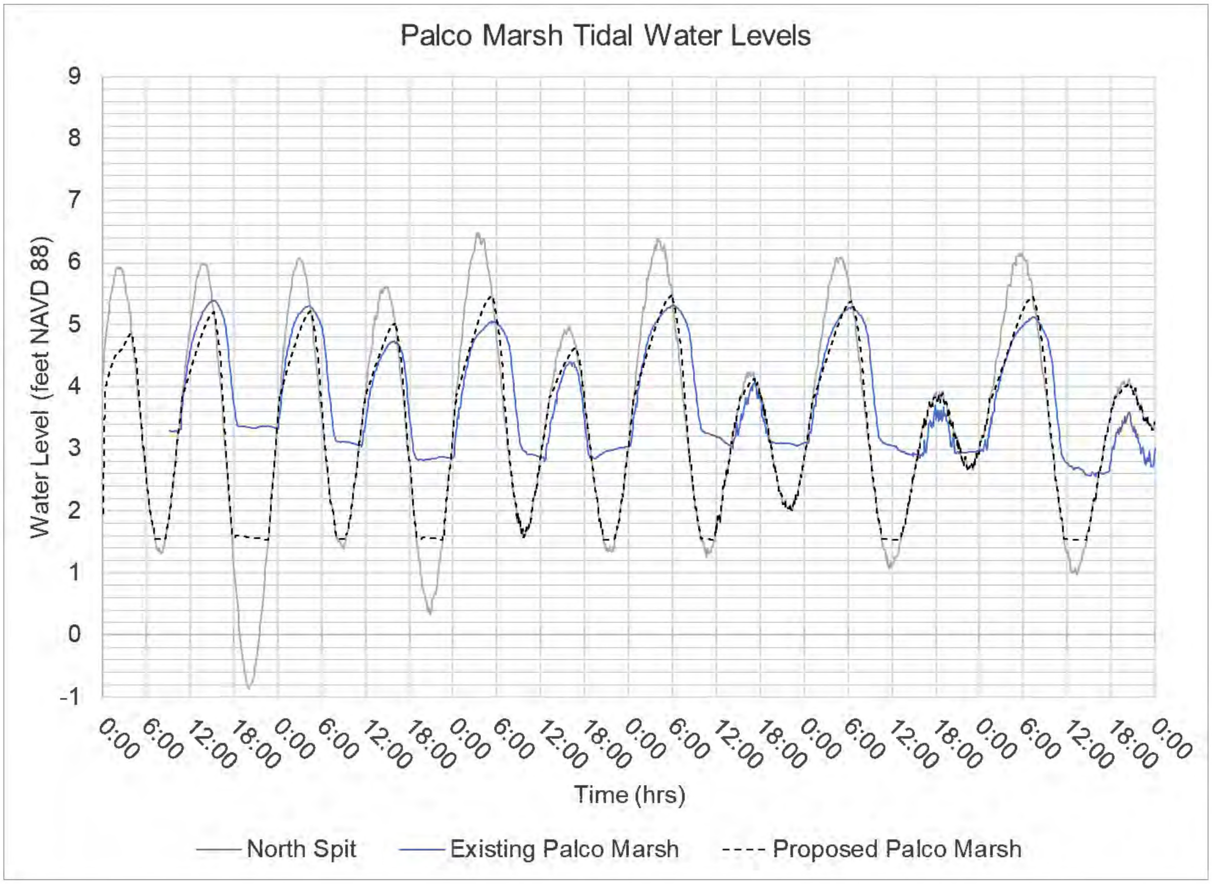

Exhibit 1-11 Typical Tidal Water Levels for existing and proposed project conditions

The implementation of the new stormdrain pipe along Del Norte Street will increase the contributing runoff area to Palco Marsh from 396 acres to 685 acres and reduces the runoff to the other locations that discharge directly to Humboldt Bay (14th Street, Koster/Washington Street, and Commercial Street) (Table 1.8-1). Runoff associated with the 85th percentile storm event and changes to contributing drainage areas are shown in Table 1.8-2. The stormwater systems discharging at 14th Street, Koster/Washington Street, and Commercial Street are interconnected, resulting in mixing of varying proportions depending on several factors including tidal water levels and storm event intensity. The additional 289 acres of runoff contributions include residential (255 acres), commercial (30 acres) and open space (4.5 acres). In total, approximately 27% (289 acres or 15.7 acre-ft) of the total watershed (1,076 acres or 58.3 acre-ft) will be conveyed to Palco Marsh instead of directly to Humboldt Bay via three discharge locations.

Table 1.8-1 Changes in contributing runoff area based on land use to Palco Marsh and directly to Humboldt Bay

Land Use	Existing (acres)	Proposed (acres)	Change (acres)
Direct to Palco Marsh then Humboldt Bay			

Land Use	Existing (acres)	Proposed (acres)	Change (acres)
Commercial	119.5	149.5	30.0
Industrial	47.9	47.9	0.0
Open Space	33.8	38.3	4.5
Residential	194.4	449.5	255.1
Total	**395.7**	**685.3**	**289.6**
Direct to Humboldt Bay (14th Street, Koster/Washington Street, and Commercial Street)			
Commercial	203.9	173.9	-30.0
Industrial	132.1	132.1	0.0
Open Space	4.5	0.0	-4.5
Residential	339.4	84.3	-255.1
Total	**679.9**	**390.3**	**-289.6**

Table 1.8-2 Changes in runoff from 85th percentile storm based on land use to Palco Marsh and directly to Humboldt Bay

Land Use	Existing (acre-ft)	Proposed (acre-ft)	Change (acre-ft)
Palco Marsh			
Commercial	6.5	8.1	1.6
Industrial	2.6	2.6	0.0
Open Space	1.8	2.1	0.2
Residential	10.5	24.3	13.8
Total	**21.4**	**37.1**	**15.7**
14th Street, Koster/Washington Street, and Commercial Street			
Commercial	11.0	9.4	-1.6
Industrial	7.2	7.2	0.0
Open Space	0.2	0.0	-0.2
Residential	18.4	4.6	-13.8
Total	**36.8**	**21.1**	**-15.7**

The duration of stormwater detention within the marsh is affected by the flow rate and duration of stormwater discharge into the marsh, the flow rate of discharge from the marsh to Humboldt Bay, and tidal water levels. Pollutant concentration within Palco Marsh is a result of the stormwater discharge volume and pollutant concentration described above and the volume and pollutant concentration of tidal water that has entered Palco Marsh from Humboldt Bay through the inverted siphon. In general, under both existing and proposed conditions, during an ebb (outgoing) tide, stormwater may continually discharge from Palco marsh to Humboldt Bay. During flood tide, stormwater will be prevented from flowing out of Palco Marsh due to the incoming tide and higher water level in Humboldt Bay compared to Palco Marsh. The 85th percentile storm event was modeled and evaluated for existing and proposed conditions in combination with two tidal scenarios on Humboldt Bay, as measured at the North Spit, CA - Station ID: 9418767: a high tide event reaching 7.7 feet (NAVD) (85th percentile higher high tide) then dropping to 1.9 feet (NAVD) and a static tidal water level of -0.34 feet (NAVD), representing Mean Lower Low Water (MLLW).

The high tide event results in both tidal waters and runoff entering Palco Marsh (Exhibit 1-12). Tidal flow from Humboldt Bay (North Spit) continually enters Palco Marsh so long as water levels in Humboldt Bay are greater than water levels in Palco Marsh. This hydraulic condition results in all stormwater discharges to Palco Marsh remaining in the marsh and mixing with tidal waters. The mixed water within Palco Marsh begins to discharge to Humboldt Bay on the ebb tide, once water levels in Palco Marsh are greater than water levels in Humboldt Bay. Under proposed conditions, the peak water level in Palco Marsh is greater than existing conditions, but water levels within the marsh drop at a faster rate, more similar to the flood tide water levels, and reach a lower water level, discharging nearly all stormwater and tidal waters within one tidal cycle before the flood tide prevents discharge to Humboldt Bay and begins to fill Palco Marsh again. Although existing conditions exhibits less stormwater entering Palco Marsh, the discharge capacity of this stormwater is limited and does not fully drain before the flood tide prevents further drainage and stormwater and tide water begin filling Palco Marsh. Although proposed conditions result in a larger volume of stormwater entering Palco Marsh, this stormwater is held in the marsh for a shorter duration and the basin drains more effectively.

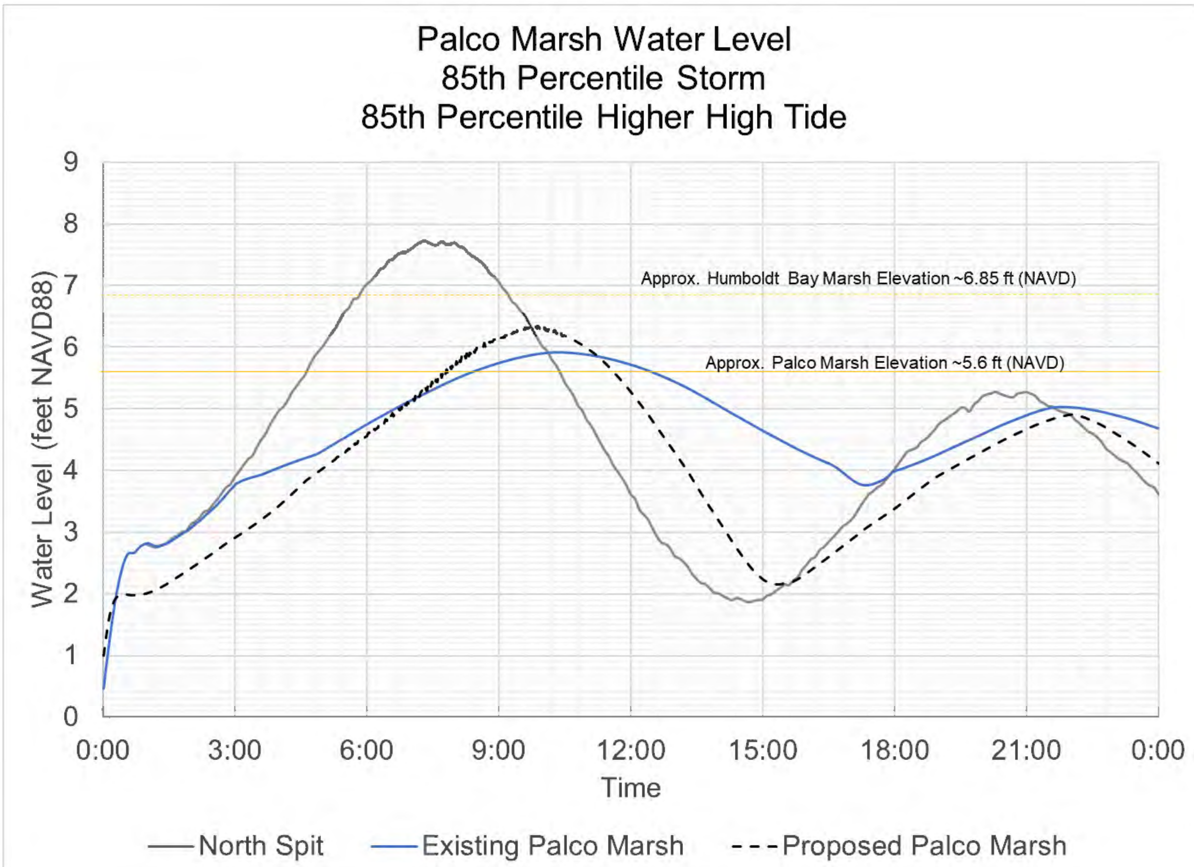

Exhibit 1-12 The increased stormwater discharge capacity from Palco Marsh to Humboldt Bay results in a reduced duration of stormwater detention within Palco Marsh and water levels with a more similar tidal signature to a natural system during a high tide event.

Under the 10-yr storm event and 85th percentile higher high tide, the proposed conditions result in more effective discharge of stormwater to Humboldt Bay, and reduce the duration of marsh plain inundation (Exhibit 1-13 and Table 1.8-3). The existing structure between Palco Marsh and Humboldt Bay is limited in conveyance capacity and runoff to Palco Marsh is equal to the discharge through the crossing, resulting in sustained freshwater inundation of the marsh plain for multiple tidal cycles, while proposed conditions water levels reach marsh plain elevations within two tidal cycles.

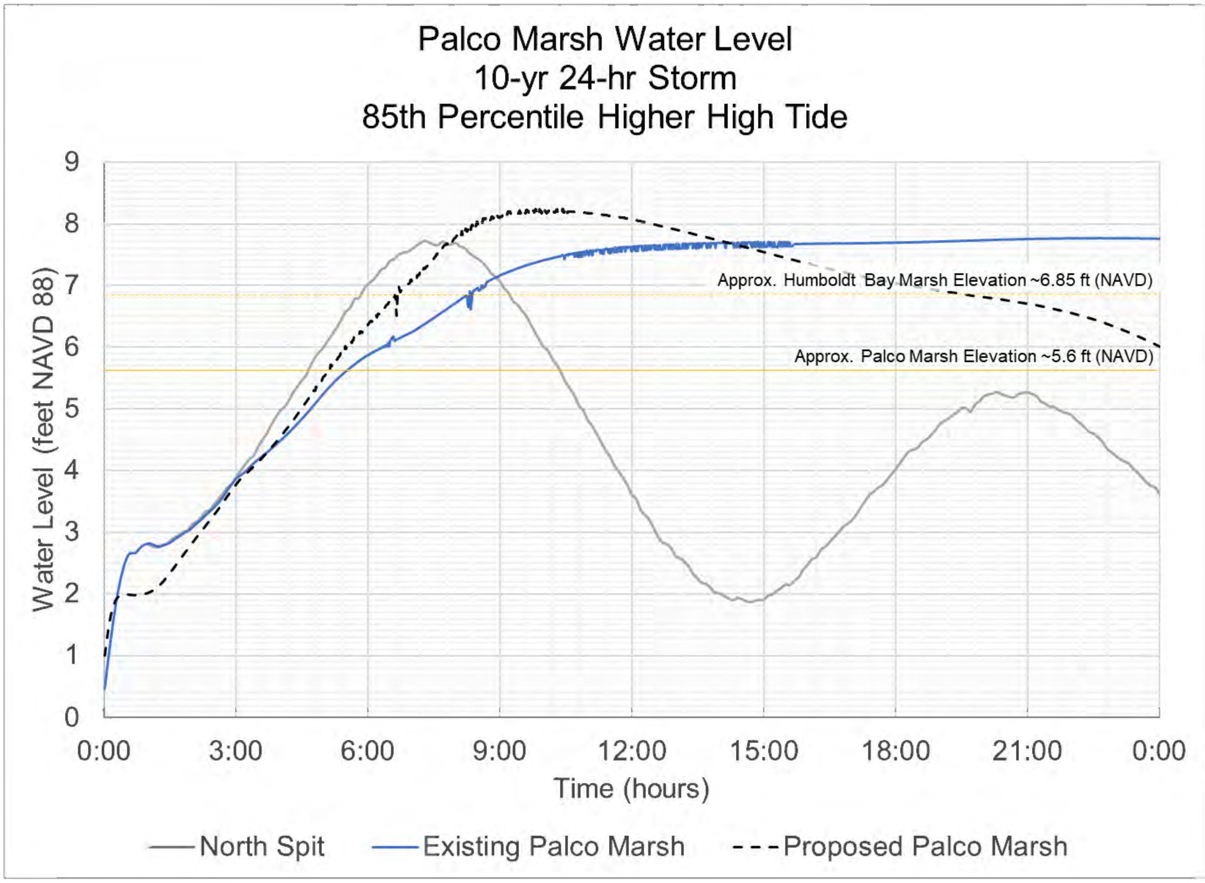

Exhibit 1-13 Existing stormwater discharge to Palco Marsh for the 10-year storm detains stormwater for multiple tidal cycles while the Project discharges the stormwater to Humboldt Bay within two tidal cycles.

Table 1.8-3. Comparison of water levels and duration of stormwater inundation and presence in Palco Marsh for existing and proposed conditions for the 10-yr event.

Parameter	Existing	Proposed
10-yr 24-hr Storm and 85th Percentile Higher High Tide		
Duration of Marsh Plain Inundation (hrs)	18.5+	8.4
Maximum Water Level (ft)	7.8	8.0
Marsh Plain Inundation	> 24 hrs	~18 hrs
Duration of Stormwater Detention in Palco Marsh (hrs between storm onset and minimum tidal elevation)	2+ tidal cycles (>24 hrs)	2 tidal cycles (>24 hrs)

The proposed project matches the existing marsh tidal inundation frequency in the absence of stormwater, which occurs most of the year. During rain events, although the total volume of stormwater increases, the duration of marsh plain inundation is less than existing conditions. During more frequent rain events (85th percentile) a portion of the stormwater remains within the marsh for multiple tidal cycles under existing conditions and is discharged in one tidal cycle with Project implementation. During larger, less frequent rain events, stormwater inundation duration is also reduced with Project implementation.

1.8.1 Existing Utility Relocation

Existing 36” and 18” diameter pressure sewer lines intersect the crossing alignment at the existing inverted siphon. A 12” diameter water line also crosses at this location (see Figure 2.3). The proposed 4 by 4 foot box culverts would be set at elevations similar to the existing structures at Palco Marsh and Humboldt Bay, but provide a continuous grade between the two location, requiring relocation of the existing utilities. Therefore, approximately 500 feet of existing sewer pipe would be abandoned in place and replaced with new piping via horizontal directional drilling below the proposed culverts. The existing water line would be replaced above the proposed culverts.

1.9 Tide Gates

Existing, ungated storm drain outfalls allow tidal flow into the storm drain network, reducing available storage capacity in the storm drain network during rain events resulting in flooding of roadways. Tide gates would be installed in up to four locations (see Table 1.9-1).

- Koster and Cedar St.: The proposed tide gate would be installed within a new vault, along the existing 60” diameter storm drain alignment. The tide gate would prevent conveyance from south to north, preserving storage in the storm drain system along Koster and Washington Streets. Storm drain flow from the east, on 14th Street, would be conveyed toward the 14th Street outfall.
- Commercial St. and Waterfront Dr.: 30-inch diameter tide gate would be installed along the existing Commercial Street storm drain. This tide gate would also be installed within a new vault along the existing alignment.
- Del Norte Street: A tide gate would be installed at the outfall from Del Norte Street into Palco Marsh in combination with the TCD.
- Palco Marsh Outfall: Two new tide gates are proposed on the outfall of the replacement crossing from Palco Marsh to Humboldt Bay. Each tide gate would be mounted on rails to allow for vertical adjustment to restrict flow into each 4 foot diameter pipe from Humboldt Bay to Palco Marsh.

Table 1.9-1 Summary of Tide Gate Storm Drain inlet size, excavation depth and Vault Size.

Location	Storm Drain Size (in)	Depth (ft)	Vault Size (ft x ft)
Koster and Cedar St.	60	10.1	7 x 7
Commercial St. and Waterfront Dr.	30	10.1	7 x 7
Del Norte St into Palco Marsh	8 ft x 4 ft	See Trash Capture	
Palco Marsh Outfall to Humboldt Bay	4x4 Culverts (2)	See Palco Marsh Enhancements	

1.10 Project Construction

1.10.1 Construction Schedule

Construction would occur within one to two construction seasons, likely commencing in the late spring/early summer 2024 and continuing eight to twelve months. Earthwork involving grading (i.e. work within Palco Marsh and Clark Slough) would be limited to occur from June 15 through September 15. If feasible, vegetation clearing outside of the nesting bird season would occur first, prior to March 15 or after August 15. Vegetation clearing would consist of removal of herbaceous plants and shrubs; no tree removal is anticipated. Construction hours would be limited to 7:00 a.m. to 6:00 p.m. Monday through Friday and 8:00 a.m. to 5:00 p.m. on Saturdays. Construction would not occur on Sundays. Nighttime construction would be limited to work within the Caltrans right-of-way. Given portions of the Project Area overlap the FEMA 100-year flood zone, construction would not occur during flood conditions.

1.10.2 Construction Activities and Equipment

All construction activities would be accompanied by both temporary and permanent erosion and sediment control best management practices (BMPs). Project construction would include the following activities:

- Jackhammering – Site preparation/removal of existing sidewalk concrete material.
- Trenching – To create access to stormwater pipe alignments to be replaced.
- Placement of imported and native fill and compaction – within trenches and under structures
- Clearing, grubbing – To prepare LID installation areas.
- Installation of new piping, LID and tide gates.
- Excavation – Channel excavation and culvert installations within Palco Marsh.
- Grading and paving – Atop and within disturbed segments of street and sidewalk, where pipe, LID and/or tidegate installations occurred.
- Installation of RSP – Near the culvert outfalls to Humboldt Bay, Palco Marsh and Clark Slough.
- Hauling – Transport of material to and from the Project Area.
- Staging of excavated material and sampling - contaminant characterization and proper disposal identification
- Storage, sampling and treatment of groundwater - contaminant characterization and proper disposal identification
- Pumping and disposal of water – Within excavations
- Horizontal Direction Drilling and or Horizontal Auger Boring – installation and relocation of pipes

Equipment required for construction would include pumps, storage tanks, jackhammers, drill rigs, concrete mixer and concrete pumping trucks, all terrain forklifts, snooper truck, compressors, tracked excavators, backhoes, graders, excavators, bulldozers, dump trucks, skid steers, and pick-up trucks. It is not anticipated that any temporary utility extensions, such as electric power or water, would be required for the Project. If necessary, water from the municipal water system or other legal means would be used for dust control, compaction and re-vegetation.

Construction Access

Due to the widespread nature of the Project, it can be accessed from multiple directions.

Establish Exclusion Areas and Erosion Control

Biological Studies have identified wetlands in and near the Project Area. Except for areas that would be unavoidably impacted during construction, resource areas to be protect would be excluded with protective fencing prior to construction. Erosion control BMPs would also be installed prior to construction.

Vegetation Removal

No trees would be removed under the Project. However some vegetation (shrubs, herbaceous plants and grasses) would be removed, predominantly within Palco Marsh to clear areas for excavations. Vegetation would be removed prior to March 15 or after August 15, if feasible, to avoid the nesting bird season.

Stockpiling and Staging

Stockpiling and staging areas for the Project would be located within a paved, formerly developed area just north of the Palco Marsh (see Appendix A, Figure 2). If additional staging or stockpiling is needed, it would occur in developed and/or paved areas and may be located outside the Project Area. Within the stockpiling and staging area(s), erosion control Best Management Practices (BMPs) would be utilized to prevent materials and/or hazardous materials from running off into adjacent waters, or otherwise impacting the environment, as required by the Project's Storm Water Pollution Prevention Program (SWPPP) (see Section 1.12.1 – Environmental Protection Action 1). Imported and excess soils, aggregate road base, and construction materials would be stored on site within designated stockpiling and staging area(s). Imported and suitable (i.e. non-contaminated) excess materials may be re-used on site for backfill and finished grading. Excess materials would not be stockpiled on-site once the Project is complete. The contractor would haul additional excess materials off site for beneficial re-use, recycling, or legal disposal. Off-site spoiling would not occur. In areas of known contamination, soils are to be stockpiled, covered with plastic sheeting to avoid runoff of contaminants, and sampled to determine appropriate disposal facilities or locations, then hauled off site and disposed of at a facility authorized to accept such soil.

Traffic and Access Control

Temporary lane closures of City streets and Broadway Street (which is under Caltrans jurisdiction) would be required for pipeline, LID and tidegate installations and would require traffic control. A standard Caltrans-approved traffic control plan would be implemented, as required by the forthcoming Caltrans Encroachment Permit. Public access along the Waterfront Trail would be temporarily limited during construction within Palco Marsh and along the tidal inlet to Humboldt Bay. Pedestrian public access would be routed around the construction area, likely via Del Norte St. and Felt St.

Groundwater Dewatering

Groundwater dewatering is expected within excavations. Temporary groundwater dewatering would involve pumping water out of a trench or excavation. Groundwater would typically be pumped to a settling pond, Baker tanks (or other similar type of settling tank), or into a dewatering bag. Discharge to regulated waters would not occur. In areas of known contamination, groundwater will be tested and if contaminated, treated with activated carbon to an acceptable level to be discharged to the City's sewer system.

Site Restoration and Closure

Following construction, the contractor would demobilize and remove equipment, supplies, and construction wastes. The disturbed areas would be restored to pre-construction conditions or stabilized with a combination of grass seed (broadcast or hydroseed), straw mulch, rolled erosion control fabric, and other plantings/revegetation. If required, revegetation would include replanting and any potential compliance monitoring in support of mitigation required by resource agencies for impacts to regulated habitats such as wetlands or other aquatic resources.

1.11 Maintenance and Operation

The City would maintain and operate the Project under normal operations as a City facility. Once construction is complete, general operation and maintenance activities associated with the proposed Project would include routine cleaning of TCDs, annual inspections, testing, exercising and servicing of valves and tide gates, and repairs of piping and equipment, and other similar operational requirements.

Operation and maintenance of the Project would not generate additional vehicle trips, above existing conditions. The City would be responsible for all maintenance. Project operation and maintenance would be consistent with existing maintenance procedures and schedule.

1.12 Compliance with Existing Regulations and Standard BMPs

The Project will abide by the following regulations and industry-accepted Best Management Practices (BMPs) to reduce or avoid potential adverse effects that could result from construction or operation of the Project. In addition to these BMPs, mitigation measures are presented in the following analysis sections in Chapter 3, Environmental Analysis, to reduce potentially significant environmental impacts below a level of significance. The Project's Mitigation Monitoring and Reporting Program will include the Environmental Protection Actions listed below, as well as mitigation measures to ensure implementation.

1.12.1 Environmental Protection Action 1 – Stormwater Pollution Prevention Plan (SWPPP)

The Project would seek coverage under State Water Resources Control Board (Regional Board) Order No. 2009-0009-DWQ, Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction and Land Disturbance Activities. The City would submit Construction General Permit registration documents (notice of intent, risk assessment, site maps, Storm Water Pollution Prevention Plan (SWPPP), annual fee, and certifications) to the Water Board. The SWPPP would address pollutant sources, best management practices, and other requirements specified in the Order. The SWPPP would include erosion and sediment control measures, and dust control practices to prevent wind erosion, sediment tracking, and dust generation by construction equipment. A Qualified SWPPP Developer would oversee the development of the SWPPP and a Qualified SWPPP Practitioner would oversee implementation of the Project SWPPP, including visual inspections, sampling and analysis, and ensuring overall compliance.

1.12.2 Environmental Protection Action 2 – Implementation of Geotechnical Design Recommendations

The Project would be designed and constructed in compliance with the site-specific recommendations made in the Geotechnical Investigation Report for Stormwater Improvements (SHN 2022a). This would include design in accordance with recommendations for excavations, dewatering and uplift pressures, active dewatering system, passive dewatering system, excavation backfill, utility trench backfill, support of below-grade structures, retaining wall, and all other recommendations in the report. The geotechnical recommendations would be incorporated into the final plans and specifications for the Project and would be implemented during construction.

1.13 Regulatory Permits, CEQA, and NEPA

The City would be the CEQA lead agency for the Project. An Initial Study/Proposed Mitigated Negative Declaration is the proposed CEQA pathway. The Project is being funded, at least partially, with federal dollars through the Federal Emergency Management Agency (FEMA), and therefore NEPA is required and would be completed by FEMA. It is anticipated that the Project would impact regulated Waters, including wetlands. The Project would require the following permits:

- U.S. Army Corps of Engineering (USACE) Clean Water Act (CWA) Section 404 permit
- Endangered Species Act (ESA) Consultation – Joint Biological Resources Evaluation to National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS) through the federal nexus with USACE via the Clean Water Act Section 404. ESA Consultation would occur if required,
- California Department of Fish and Wildlife (CDFW) Consistency Determination for the California Endangered Species Act (CESA). An Incidental Take Permit would be acquired if required.
- North Coast Regional Water Quality Control Board (Regional Board) Section 401 Water Quality Certification
- California Coastal Commission (CCC) Coastal Development Permit amendment of existing permit (1-90-104) which covers the Palco Marsh
- City of Eureka Coastal Development Permit
- Humboldt Bay Harbor, Recreation and Conservation District (HCHRCD) Shoreline Development Permit
- Caltrans Encroachment Permit
- North Coast Rail Authority (NCRA) Encroachment Permit

1.14 Tribal Consultation

On May 3, 2022, the City of Eureka sent the Bear River Band of Rohnerville Rancheria, Blue Lake Rancheria, Cher-Ae Heights Indian Community of the Trinidad Rancheria, and the Wiyot Tribe a tribal consultation invitation pursuant to Public Resources Code section 21080.3.1. A 30-day period allowing for a request for consultation ended with no request made for consultation on tribal cultural resources (as a component of AB 52). For additional information, please see Section 3.18, Tribal Cultural Resources. The tribes listed above were also contacted in spring 2021 during preparation of the Cultural Resources Investigation Report. Tribes consulted with the cultural resource specialist and proposed protective measures to cultural resources are discussed in Section 3.5 (Cultural Resources).

2. Environmental Factors Potentially Affected

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages. Where checked below, the topic with a "Potentially Significant Impact" would be addressed in an Environmental Impact Report:

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

DETERMINATION (To be completed by the Lead Agency)

On the basis of this initial evaluation:

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

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

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

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

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect: (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required. .

____ ____________________

Jesse Willor, City Engineer, City of Eureka Date

3. Environmental Analysis

3.1 Aesthetics

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

The Project Area consists of developed or disturbed areas (predominantly streets and intersections) and marshlands (within Palco Marsh) within the City of Eureka. The Project includes subsurface and aboveground work along various city streets in residential and commercial/industrial areas and in areas with existing drainage infrastructure adjacent to natural or open spaces. View corridors to and from the Project Area include Humboldt Bay, Eureka's waterfront, Highway 101, and various city streets, businesses, and residences.

a) Have a substantial adverse effect on a scenic vista? (Less than Significant Impact)

A scenic vista can be defined as a view that has remarkable scenery or a broad or outstanding view of the natural landscape. The City's General Plan Visual Resources section identifies visual resources such as the Carson Mansion, Humboldt Bay, the waterfront, landmark buildings, gulches and greenways, and surrounding agricultural and timberlands. The Project would predominantly occur in developed and disturbed areas, including city streets and at existing storm drain outfall locations, and within Palco Marsh. Project elements are subsurface or low profile and would not obstruct views of Humboldt Bay or the waterfront. No Project elements are proposed near the Carson Mansion.

The visual appearance of the directional drilling and pipe installation work areas and the associated equipment staging grounds would be affected only during the construction phase of the Project due to the presence of construction equipment and would be short term. However, the majority of Project elements would be installed subsurface (piping, tide gates, two of the four TCDs) and therefore would not alter the appearance of the site post-Project. The proposed Palco Marsh improvements, LID features and remaining two TCDs would occur at the surface level which would result in a modification of visual resources as compared to baseline conditions. Work proposed in Palco Marsh, which includes extension, deepening and widening of an existing channel between the existing Humboldt Bay tidal inlet and Del Norte St. stormwater outfall, would looks similar to the existing conditions in the tidally influenced marsh. The LID features would convert two hardscape intersections to contain landscaped greenery, therefore improving visual resources. The surface-level TCDs would be located at the Del Norte St. outfall into Palco Marsh and within Clark Slough at Koster St. and Washington St, and therefore would be visible to the public. TCDs capture trash within a mesh net and would be maintained on a regular schedule by the City, and therefore would not become overloaded with trash causing an impact to visual resources. Headwalls and wingwalls at existing stormdrain outfalls and crossings would be constructed at the transition between the open slough channels and existing grade above outfalls. Installation of LID features, tide gates, TCDs, manholes, junction boxes, and culverts would occur in developed areas and would minimally alter the post-Project appearance. Scenic vistas are present in some portions of the Project Area, including views of Humboldt Bay and the waterfront, and Project construction would temporarily affect those views (particularly at Palco Marsh and along the waterfront at the northern terminus of Commercial Street). However, no permanent adverse impact to scenic vistas would occur because work in those areas would either result in views that are similar to existing conditions (such as in Palco Marsh) or would not modify existing views because Project elements are subsurface (such as work near the City's waterfront). Project components would have a temporary impact during construction; however, operationally no visual changes would occur to existing scenic vista conditions. A less than significant impact would result.

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway? (Less than Significant Impact)

According to the California Scenic Highway Mapping System, there are no designated state scenic highways in the Project vicinity. Highway 101 is listed as "Eligible State Scenic Highways-Not Officially Designated" (Caltrans 2019). General Plan Goal E-7.6 and Goal LU-3.4 outline goals for beautification of the Broadway Corridor, which includes Highway 101. The Project crosses Broadway Avenue in one location and includes elements where construction may be visible from the Broadway Corridor (Highway 101). However, as mentioned, Project construction would be temporary, and operationally the Project would not modify scenic resources or viewsheds to or from Highway 101 because Project elements are subsurface or low profile and consistent with surrounding storm drainage infrastructure. A less than significant impact would result.

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

Subsurface Project work includes replacement of storm drainpipes, culverts, manholes, junction boxes, and vaults with tide gates which would include areas along Commercial St., Koster St., Williams St., Long St., California St., Short St., Hawthorne St., B St., and Del Norte St. Project construction scenarios include the installation of a new or relocated underground pipe via directional drilling, horizontal auger boring and trenching. In areas where trenching is implemented, following replacement of underground stormwater piping, vaults and junction boxes, the roadway would be repaved within the same footprint and would not result in a visual change. Proposed pipe, vault and junction box replacement and installation locations span multiple zoning areas, and include General Industrial (GI), Limited Industrial (LI), Service Commercial (SC), Public Facilities-Coastal Zone (PF, Hwy 101), Residential High (HDR), Medium (MDR) and Low Density (LDR), Office Residential (OR), and Public (P). The Project would not conflict with these zoning designations because no change in land uses would occur due to implementation of the Project.

Aboveground Project elements would include the installation of LID features, tide gates, TCDs, headwalls and wingwalls and construction of Palco marsh enhancements. Tide gates would be installed at existing storm drain outfalls at Del Norte St., and Palco Marsh. Given these areas currently have existing outfalls, the new tide gates would not significantly change existing visual conditions. Surface level Project components, and their context to applicable zoning and other regulations, are further discussed below.

TCDs would include both surface and subsurface installation (two surface, and two subsurface). The surface-level TCDs would be installed at the existing storm drain outfalls into Palco Marsh (Del Norte St and Railroad Ave) and Clark Slough (Washington and Koster Streets) and would consist of concrete headwalls, wingwalls and an apron, located between the back of sidewalk and within the existing slough channel or marsh. TCD headwalls would rise approximately 1 foot or less above the existing ground elevation and may include a guardrail adjacent to the sidewalk for pedestrian safety; therefore, would not obstruct views of Humboldt Bay. The two subsurface TCDs would be installed within paved areas and concrete vaults along the existing storm drain alignments at 14th and Railroad Ave, and Commercial Street and Waterfront Drive. TCDs include a mesh net which allows stormwater to flow through it and capture trash that would otherwise be discharged to the sloughs and bay. The mesh bags lie on the ground and extends downstream approximately 10 linear feet. The bags would be visible at the Palco Marsh and Clark Slough locations, however they would capture trash before it enters the bay, contributing to reduced regional blight. TCDs would be maintained by City staff on a regular schedule. Zoning at proposed TCD surface level installation areas is Natural Resources (NR), Public (P) and Limited Industrial (LI); and zoning at subsurface TCD installation locations is Coastal Dependent Industrial (CDI). The Project would not conflict with these zoning designations because no change in land uses would occur due to implementation of the Project and the TCDs would reduce the volume of debris and trash that enters the marsh system and ultimately Humboldt Bay.

LID features would be located within existing roadway and sidewalk rights-of-way, would have a low profile, and would not obstruct current views of Humboldt Bay or other view corridors on public streets. LID features would include the installation of natural vegetation in areas that are currently covered in concrete, and therefore may be considered beautification or visual enhancement. Zoning at proposed LID installation areas is Office Residential (OR), Medium Density Residential (MDR) and High Density Residential (HDR). The Project would not conflict with these zoning designations because no change in land uses would occur from implementation of the Project. LID vegetation would consist of herbaceous plants, and therefore would not obstruct view corridors per General Plan Goal NR-4.1 or signage along streets for pedestrian visibility and safety. The Project does not conflict with any local regulations governing scenic quality.

Palco Marsh enhancement activities include channel excavation, channel enhancements, and replacement of an existing outfall pipe and headwalls into Humboldt Bay with two parallel 4-by-4-foot box culverts with vertically adjustable tide gates and new concrete headwalls, wingwalls and aprons constructed on each side or maintain a similar configuration as existing by expanding the inverted siphon and crossing with additional pipes to avoid utility conflicts. The culverts would be located mostly subsurface, with minimal visibility of the headwalls, wingwalls and aprons above ground (similar to current conditions). The inverted siphon would also look similar to existing conditions. Channel excavation and enhancements would be consistent with the existing natural and open space aesthetic of Palco Marsh. The culverts and tide gates would have a low profile and would not obstruct views to or from Humboldt Bay or the waterfront trail. Palco Marsh is zoned Natural Resources (NR), and the proposed Project work at Palco Marsh would not conflict with this zoning designation.

All Project construction scenarios would include the temporary presence and use of construction equipment during the construction phase of the Project. Project operation would include minor changes to existing streetscapes, consistent with existing development, and would not obstruct view corridors or other scenic resource. The Project would not modify existing land uses or conflict with zoning or General Plan goals related to visual resources. Although the Project would not substantially degrade the visual character or public views of the Project, the presence of surface level TCDs has the potential to adversely impact the visual character of the surrounding area. This potential impact would be reduced through routine maintenance of the TCDs, which is a planned component of the Project (see Section 1.11 – Maintenance and Operation). Therefore, potential impacts would be less than significant.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area? (No Impact)

Existing street and pedestrian lights currently exist in the Project Area. The Project does not propose to add or remove permanent or temporary sources of light. The storm drain network would be underground and therefore would produce no glare. Other Project elements that are above the surface such as LIDs, TCDs, tide gates, and marsh enhancements would not include material that would produce a substantial amount of glare. No impact would result.

3.2 Agriculture and Forest Resources

	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				X
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				X
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?				X
d) Result in the loss of forest land or conversion of forest land to non-forest use?				X
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?				X

The Project Area is predominantly located in developed portions of the City of Eureka, and lesser so within undeveloped portions (Palco Marsh). There are no lands managed for agriculture or timber production within the Project Area, nor areas zoned for agriculture or timber production. Palco Marsh is zoned as Natural Resources, but no trees are planned for removal in this area.

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland)? (No Impact)

As of the date of this ISMND, soil data in Humboldt County has not been compiled into the Farmland Mapping and Monitoring Program and therefore, there are no lands mapped as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance identified by California Department of Conservation (DOC) within the Project Area (DOC 2021a).

Further analysis of soils within the Project Area by the Natural Resources Conservation Service (NRCS) Web Soil Survey show that one soil series is mapped as Prime Farmland if irrigated (Urban land-Halfbluff-Redsands complex, 0 to 5 percent slopes), and one soil series (Urban land-Anthraltic Xerorthents association, 0 to 2 percent slopes) could potentially be Farmland of Statewide importance (USDA 2022). However, since construction and operation of the Project would cause no modifications to land use, no conversion of potential Prime Farmland, Unique Farmland, or Farmland of Statewide Importance would occur. No impact would occur.

b) Conflict with Agricultural Zoning or Williamson Act Contract? (No Impact)

There are no properties with agricultural zoning or properties enrolled in Williamson Act contracts within the Project Area. Zoning within the Project Area is discussed in Section 3.11 (Land Use and Planning). Construction and operation of the Project would have no effect on agricultural zoning or Williamson Act contracts because none exists within the Project Area. No impact would result.

c, d) Conflict with Forest Land Zoning or Convert Forest Land? (No Impact)

There are no forest lands, timberland, or land zoned Timberland Production Zone in the Project Area; therefore, no forest land or timberland would be converted to non-forest or non-timberland use. The Palco Marsh portion of the Project Area is zoned as Natural Resources, however no trees would be removed under the Project. No impact would result.

e) Convert Farmland or Forest? (No Impact)

As mentioned in questions a-d, the Project would not convert farmland because there is no existing farmland in the Project Area and would not remove any trees. Therefore the Project would not convert any farmland or forests to other uses. No impact would result.

3.3 Air Quality

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

The Project is located within the North Coast Air Basin (Air Basin), which is managed by the North Coast Unified Air Quality Management District (NCUAQMD or District). The NCUAQMD monitors air quality, enforces local, State, and federal air quality regulations for counties within its jurisdiction, inventories and assesses the health risks of Toxic Air Contaminants (TACs), and adopts rules that limit pollution.

For construction emissions, the NCUAQMD has indicated that emissions are not considered regionally significant for projects when construction would be relatively short in duration, lasting less than one year. Construction is expected to require approximately 100 working days to complete and would occur in 2023. Emissions related to construction were calculated using the California Emissions Estimator Model (CalEEMod) version 2020.4.0 and are discussed below (also see Appendix B – CalEEMod Modeling Output).

a) Conflict with or obstruct implementation of the applicable air quality plan? (Less than Significant Impact with Mitigation)

This impact relates to consistency with an adopted attainment plan. Within the Project vicinity, the NCUAQMD is responsible for monitoring and enforcing local, state, and federal air quality standards.

Humboldt County is designated ‘attainment’ for all National Ambient Air Quality Standards. With regard to the California Ambient Air Quality Standards, Humboldt County is designated attainment for all pollutants except PM_{10}. Humboldt County is designated as “non-attainment” for the state’s PM_{10} standard. Rule 104, Section D – Fugitive Dust Emissions is used by the NCUAQMD to address non-attainment for PM_{10}.

PM_{10} refers to inhalable particulate matter with an aerodynamic diameter of less than 10 microns. PM_{10} includes emission of small particles that consist of dry solid fragments, droplets of water, or solid cores with liquid coatings. The particles vary in shape, size, and composition. PM_{10} emissions include unpaved road dust, smoke from wood stoves, construction dust, open burning of vegetation, and airborne salts and other particulate matter naturally generated by ocean surf. Therefore, any use or activity that generates airborne particulate matter may be of concern to the NCUAQMD. The proposed Project would create PM_{10} emissions in part through vehicles coming and going to the Project Area and the construction activity associated with the Project.

To address non-attainment for PM10, the NCUAQMD adopted a Particulate Matter Attainment Plan in 1995. This plan presents available information about the nature and causes of PM10 standard exceedances and identifies cost-effective control measures to reduce PM10 emissions to levels necessary to meet California Ambient Air Quality Standards. However, the NCUAQMD states that the plan, “should be used cautiously as it is not a document that is required in order for the District to come into attainment for the state standard” (NCUAQMD 2022). Therefore, compliance with applicable NCUAQMD PM10 rules is applied as the threshold of significance for the purposes of analysis. NCUAQMD Rule 104 Section D, Fugitive Dust Emissions, is applicable to the Project.

Pursuant to Rule 104 Section D, the handling, transporting, or open storage of materials in such a manner, which allows or may allow unnecessary amounts of particulate matter to become airborne, shall not be permitted. Reasonable precautions shall be taken to prevent particulate matter from becoming airborne, including, but not limited to covering open bodied trucks when used for transporting materials likely to give rise to airborne dust and the use of water during the grading of roads or the clearing of land. During earth moving activities, fugitive dust (PM_{10}) would be generated. The amount of dust generated at any given time would be highly variable and is dependent on the size of the area disturbed at any given time, amount of activity, soil conditions, and meteorological conditions. Unless controlled, fugitive dust emissions during construction of the proposed Project could be a potentially significant impact, therefore, Mitigation Measure AQ-1 would be incorporated to comply with NCUAQMD's Rule 104 Section D to achieve a less than significant impact with mitigation.

Operation of the Project would not include the handling, transporting, or open storage of materials in which particulate matter may become airborne. Due to the absence of handling, transport, or open storage of materials that would generate particulate matter, operation of the Project is not expected to conflict with NCUAQMD's Rule 104 Section D. No impact from operation of the Project would result.

Mitigation

Implementation of Mitigation Measures AQ-1 is proposed to reduce the potential impact related to PM_{10} fugitive dust by requiring BMPs.

Mitigation Measure AQ-1: BMPs to Reduce Air Pollution

The contractor shall implement the following BMPs during construction:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, active graded areas, excavations, and unpaved access roads) shall be watered areas of active construction at a sufficient interval to avoid the migration of fugitive dust, anticipated to be two times per day or unless natural precipitation has occurred.
- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 mph, unless the unpaved road surface has been treated for dust suppression with water, rock, wood chip mulch, or other dust prevention measures.
- All roadways, driveways, and sidewalks to be paved shall be completed in a timely manner.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes.
- All construction equipment shall be maintained and properly tuned in accordance with the manufacturer's specifications.
- Post a publicly visible sign with the telephone number and person to contact at the City regarding dust complaints. This person shall respond and take corrective action within 48 hours. The NCUAQMD's phone number shall also be visible to ensure compliance with applicable regulations.

With implementation of Mitigation Measure AQ-1, the Project would not conflict with applicable air plans. This impact would be reduced to a less than significant level with mitigation.

b) Result in a cumulatively considerable net increase in any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard? (Less than Significant Impact)

This impact is related to regional criteria pollutant impacts. As identified in Section 3.3 Impact (a), Humboldt County is designated nonattainment of the State's PM_{10} standard. The Project Area is designated attainment for all other State and federal standards. Potential impacts of concern will be exceedances of State or federal standards for PM_{10}. Localized PM_{10} is of concern during construction because of the potential to emit fugitive dust during earth-disturbing activities.

Construction

Localized PM_{10}

The Project would include demolition, grading, trenching, and asphalt paving activity. Generally, the most substantial air pollutant emissions would be dust generated from grading and excavation. If uncontrolled, these emissions could lead to both health and nuisance impacts. Construction activities would also temporarily generate emissions of equipment exhaust and other air contaminants. The Project's potential impacts from equipment exhaust are assessed separately in Section 3.3 (c) below.

The NCUAQMD does not have formally adopted thresholds of significance for fugitive, dust-related particulate matter emissions above and beyond Rule 104, Section D, which does not provide quantitative standards. For the purposes of analysis, this document uses the Bay Area Air Quality Management District (BAAQMD) approach to determining significance for fugitive dust emissions from project construction. The BAAQMD bases the determination of significance for fugitive dust on a consideration of the control measures to be implemented. If all appropriate emissions control measures recommended by BAAQMD are implemented for a project, then fugitive dust emissions during construction are not considered significant. BAAQMD recommends a specific set of "Basic Construction Measures" to reduce emissions of construction-generated PM_{10} to less than significant. Without incorporation of these Basic Construction Measures, the Project's construction-generated fugitive PM_{10} (dust) would result in a potentially significant impact.

The Basic Construction Measure controls recommended by the BAAQMD are incorporated into Mitigation Measure AQ-1. These controls are consistent with NCUAQMD Rule 104 Section D, Fugitive Dust Emission and provide supplemental, additional control of fugitive dust emissions beyond that which would occur with Rule 104 Section D compliance alone. Therefore, with incorporation of Mitigation Measure AQ-1 the Project would result in a less than significant impact with mitigation for construction-period PM_{10} generation, and would not violate or substantially contribute to an existing or projected air quality violation.

Construction Criteria Pollutants

For construction emissions, the NCUAQMD has indicated that emissions are not considered regionally significant for projects whose construction would be of relatively short duration, lasting less than one year. For project construction lasting more than one year or that involves above average construction intensity in volume of equipment or area disturbed, construction emissions may be compared to the stationary source thresholds.

The NCUAQMD does not have established CEQA significance criteria to determine the significance of impacts that may result from a project; however, the NCUAQMD does have criteria pollutant significance thresholds for new or modified stationary source projects proposed within the NCUAQMD's jurisdiction. NCUAQMD has indicated that it is appropriate for lead agencies to compare proposed construction emissions that last more than one year to its stationary source significance thresholds, which are:

- Nitrogen oxides – 40 tons per year,
- Reactive organic gases – 40 tons per year,
- PM10 – 15 tons per year, and
- Carbon monoxide – 100 tons per year.

If an individual project's emission of a particular criteria pollutant is within the thresholds outlined above, the project's effects concerning that pollutant are considered to be less than significant.

Construction of the Project is expected to begin in 2023 and be completed within 8-12 months. Detailed construction equipment activity was estimated based on Project construction components and detailed data from the Project's engineering design team. For the purposes of a conservative analysis, emissions modeling did not include the activities included in Mitigation Measure AQ-1, such as watering the construction site daily, promptly replacing ground cover on disturbed areas, and cleaning track out off of paved roadways. Table 3.3-1 summarizes construction-related emissions, which includes haul trips for an estimated 2,520 cubic yards of off haul spanning a 76 mile trip length within the County (and thus North Coast Air Basin and affecting local attainment). Emissions associated with the remaining 206 miles between the Humboldt County line and the Vacaville Recology Center are discussed in Section 3.8 - Greenhouse Gas Emissions. As shown in the table, the Project's construction emissions would not exceed the NCUAQMD's stationary sources emission thresholds in any year of construction. Therefore, the Project's construction emissions are considered to have a less than significant impact.

Table 3.3-1 Construction Regional Pollutant Emissions

Parameter	Emissions (tons per year)			
	ROG	NOx	CO	PM10
Project Construction	0.06	0.59	0.71	0.10
NCUAQMD Stationary Source Thresholds	40	40	100	15
Significant Impact?	*No*	*No*	*No*	*No*

Operational Criteria Pollutants

Following construction, operation of the Project would not include any stationary sources of air emissions. General operation and maintenance activities associated with the proposed Project would include annual inspections and repairs of piping and equipment, and other similar operational requirements. Operation and maintenance of the Project would not generate additional vehicle trips, above existing conditions. Therefore, the Project would not result in an increase in operational emissions above the existing conditions, and the Project's operations would have no impact.

c) Expose sensitive receptors to substantial pollutant concentrations? (Less than Significant Impact with Mitigation)

Activities occurring near sensitive receptors should receive a higher level of preventative planning. Sensitive receptors include school-aged children (schools, daycare, playgrounds), the elderly (retirement community, nursing homes), the infirm (medical facilities/offices), and those who exercise outdoors regularly (public and private exercise facilities, parks).

There are multiple existing residences along the Project alignment. The nearest school to the Project is St. Bernard's Academy, located approximately 430 feet south of the Williams Street Region.

BAAQMD's Basic Construction Measures included in Mitigation Measure AQ-1 (BMPs to Reduce Air Pollution) minimize idling times for trucks and equipment to five minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]) and ensures construction equipment is maintained in accordance with manufacturer's specifications.

Project construction activities would occur in segments as pipes are replaced or installed in different areas throughout the Project, and is not expected to include intensive or prolonged construction equipment use in any one location. Construction activity for the entire Project is anticipated to be complete within 8-12 months. Due to the short duration, distribution of activities (no one area of prolonged or intense construction activity), and the implementation of Mitigation Measure AQ-1 which would control fugitive dust, the Project would not result in the exposure of sensitive receptors to substantial pollutant concentrations. Therefore, with implementation of Mitigation Measure AQ-1 the construction-related impact would be less than significant with mitigation.

Following construction, the Project would not include any stationary sources of air emissions or new emissions that would result in substantial long-term operational emissions of criteria air pollutants that would substantially affect sensitive receptors. Therefore, Project operation would not expose nearby sensitive receptors to substantial levels of pollutants and would result in no impact.

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

The Project would create limited exhaust fumes from gas and diesel powered equipment. The likelihood of these odors and emissions reaching nearby receptors is influenced by atmospheric conditions, specifically wind direction. Due to the relative short-term nature of construction, and the distribution of activities, emissions or odors caused by construction of the Project would not adversely affect a substantial amount of people. Therefore, a less than significant impact would occur.

Following construction, implementation of the Project would not result in any major sources of odor or emissions above the existing conditions. No operational impact would result.

3.4 Biological Resources

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

The Project would involve the clearing and grubbing of vegetation within areas of Palco Marsh and Clark Slough (Washington and Koster Streets) that require excavation. All other Project areas are within paved, disturbed or non-vegetated areas. Construction staging areas would be located on developed and/or paved areas near Del Norte Street within the Project Area (see Figure 2.3 in Appendix A). Natural habitat is present within the Project Area, and baseline conditions include wetlands, salt marsh, tidal inlets, and habitat for special status species as described below.

A Biological Resources Evaluation (BRE) was prepared to evaluate baseline environmental conditions within the Project Area and to determine the potential for special status plants, wildlife species, and Sensitive Natural Communities (SNCs) to occur and is attached as Appendix C (GHD 2022a). Special status species include those that are federal- or state-listed under the federal or state Endangered Species Act (ESA; CESA), state fully protected species (FP), state species of special concern (SSC), species on the CDFW Special Animals List (SAL), or species considered state rare (SR), among others. Information in the BRE was compiled through a review of literature, database searches, site visits, water sample testing for environmental DNA (eDNA), and a reconnaissance-level habitat survey. Database searches included the CNDDB (CDFW 2022a), CNPS Inventory of Rare and Endangered Vascular Plants (CNPS 2022), USFWS Information for Planning and Conservation (IPaC; USFWS 2022), and the NOAA Fisheries West Coast Region California Species List Tools (NOAA Fisheries 2021). The CDFW and NPS searches encompassed the U.S. Geological Survey (USGS) quadrangle (quad) centered on the Project Area (Eureka), and the surrounding eight quads. The USFWS and NMFS searches encompassed a Project-level search, limited to the Eureka quad. In addition, citizen science databases were reviewed for additional local wildlife and botanical information (BAMVT 2022, Bumble Bee Watch 2022, eBird 2022, iNaturalist 2022). The BRE established a

Project Study Boundary (PSB) that included a 50-foot buffer area around the Project Area footprint. The Botanical and Aquatic Resources Survey Area (BARSA) is a smaller survey extent within the PSB, that represents the area in which protocol-level rare plants surveys, SNC survey, fisheries sampling and an aquatic resource delineation were conducted (see Appendix A, Figure 4 for the BARSA location). These surveys were not conducted throughout the entire PSB, as much of it is hardscape/non-habitat.

A delineation of aquatic resources (wetlands, tidal inlets, etc.) within the BARSA was conducted, and four three-parameter wetlands, one two-parameter wetland and two waterways (one tidally influenced [west of Palco Marsh], and the other disconnected from the tide via a tide gate [Clark Slough, at Koster St. and Washington St.) were observed. The Aquatic Resources Delineation report (GHD 2022b) is attached as Appendix F to Appendix C. In total, there are 4.90 acres (213,575 ft^2) of three parameter wetlands, and 0.02 acre (930 ft^2) of two-parameter wetlands, 1.00 acre (43,350 ft^2) of land and water are below the observed high tide line of the Humboldt Bay tidal inlet, and 0.09 acre (4,095 ft^2) of land and water are below the Ordinary High Water Mark of Clark Slough. All delineated aquatic resources drain into Humboldt Bay, a navigable waterway, therefore the wetlands and tidal and non-tidal waterways are all assumed to be USACE- and Regional Board-jurisdictional. All delineated aquatic resources are located within the Coastal Zone, and therefore are all assumed to be California Coastal Commission or City of Eureka jurisdictional, depending on which permitting jurisdiction the aquatic resource is located.

Habitat within the PSB can be described as either unsuitable or marginal for most species due to the hardscape of developed roadways except for the area within the BARSA, including Palco Marsh which provides coastal salt marsh habitat to waterfowl and fish, the adjacent tidal inlet which provides aquatic habitat for fish, and the remaining wetlands and Clark Slough channel at Washington Street (which is located upstream of a tide gate), which provide marginal wildlife habitat due to size and existing contamination. The findings of the habitat evaluation, field surveys for special status plants and SNCs, fisheries sampling and aquatic resource delineation is summarized in the BRE (see Appendix C), and details of the aquatic resources delineation are presented in the report attached as Appendix F to Appendix C.

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

Impact analysis in this section is based on the Project's BRE analysis. Sensitive and special status species and communities known to occur or have high potential to occur within the PSB are identified below. The potential for special status species and communities to occur was determined by: (1) reviewing the current distribution of each species and whether it overlapped with the PSB; (2) reviewing the documented occurrence information from field surveys, CNDDB and other information sources (including Bat Acoustic Monitoring Visualization Tool [BatAMVT] 2022, Bumble Bee Watch 2022, eBird 2022, iNaturalist 2022); (3) comparing the habitat associations of each species with habitat quality and conditions in and adjacent to the PSB, based on existing information (e.g., field surveys, elevation, aerial imagery); and (4) using qualified professional judgement to evaluate habitat quality and the relevance of occurrence data, or the lack thereof. Species or sensitive resources which are likely to be impacted as a result of the Project and require specific mitigation measures to lessen these impacts are further summarized below.

In general, Project activities would be localized and temporary and are not expected to result in any long term or significant impacts to sensitive biological resources with mitigation incorporated. The construction of the Project is anticipated to impact aquatic resources, Northern Red-legged Frogs, and migratory birds via the following activities: clearing and grubbing, placement of fill (including installation of a new outfall within the tidal channel, and installation of new pipes associated with an existing outfall in the tidal channel), temporary dewatering to accommodate work in the Humboldt Bay tidal inlet, Palco Marsh, and (if not dry) within Clark Slough, and the potential need to relocate fish in the channel in association with dewatering. Identified special-status plants would be avoided. These anticipated construction-related impacts are discussed below.

The operational phase of the Project has little potential to impact special status species because Project elements requiring maintenance predominantly occur within the developed portion of the City. Routine maintenance of Project elements including storm water pipes, TCDs, tide gates and LID features would all occur consistent with the City's existing maintenance of public works infrastructure schedule. No maintenance is anticipated within Palco Marsh, and minor maintenance (if any) of the culverts which connect Palco Marsh to Humboldt Bay is anticipated which would consist of removing debris from culverts during low tide. Operational impacts would be less than significant.

Special-status Plant Species

Special status plant species include those listed as endangered, threatened, or as candidate species by the CDFW, under CESA, and/or under the federal ESA. Plant species on the California Native Plant Society's California Rare Plant Ranking (CRPR) Lists 1A, 1B and 2A and 2B are also considered eligible for State listing as endangered or threatened pursuant to the California Fish and Game Code (FGC); the CDFW has oversight of these special status plant species as a trustee agency. As part of the CEQA process, such species should be considered, as they meet the definition of threatened or endangered under Sections 2062 and 2067 of the California FGC. There are occasions where CRPR List 3 or 4 species might be considered of special concern particularly for the type locality of a plant, for populations at the periphery of a species range, or in areas where the taxon is especially uncommon or has sustained heavy losses, or from populations exhibiting unusual morphology.

Three federally listed plant species (all endangered) that are regulated by the USFWS under the ESA were identified as being previously recorded within the vicinity of the PSB (i.e., within the 1 quad search area): beach layia (*Layia carnosa*), Menzies' wallflower (*Erysimum menziesii*), and western lily (*Lilium occidentale*). These species are also California state listed under CESA and have state rare plants rankings of S1 or S2. None of these records overlapped with the PSB or occurred in the immediate Project vicinity (nearest occurrences all associated with coastal dune habitat) with the exception of a non-specific record for Western lily. No suitable habitat (i.e., coniferous forest, freshwater marsh, or coastal grassland) for Western lily is present in the PSB; species occurrences are well-documented, and none are known from the Project vicinity (closest known population at Table Bluff Ecological Reserve, approximately six miles to the south) (USFWS 2009, CDFW 2022b. All of these species were excluded from further consideration based on a lack of suitable habitat within the PSB (which includes the BARSA).

No CESA listed plants, other than the three previously described (those also listed as federally endangered above which are eliminated from further consideration due to a lack of habitat present), were identified during scoping. Twenty-five species with rare plant rankings of 1 or 2, tracked by the CNDDB or CNPS, were identified during scoping in the vicinity of the Project (i.e., within the 1 quad search area). Of these, nine have high potential to occur: coastal marsh milk-vetch (*Astragalus pycnostachyus* var. *pycnostachyus*), Humboldt Bay owl's clover (*Castilleja ambigua* var *humboldtiensis*), Point Reyes bird's beak (*Chloropyron maritimum* ssp. *palustre*), Pacific gilia (*Gilia capitata* ssp. *pacifica*), marsh pea (*Lathyrus palustris*), Howell's montia (*Montia howellii*), Siskiyou checkerbloom (*Sidalcea malviflora* ssp. *patula*), western sand-spurrey (*Spergularia canadensis* var. *occidentalis*), and alpine marsh violet (*Viola palustris*). Potential to occur was determined based on 1) current species distribution in relation to the PSB, 2) nearby occurrence records, 3) potentially suitable habitat present, 4) professional judgement based on field surveys.

One special status plant species, Point Reyes bird's-beak, was observed during floristic surveys within the BARSA. No special status plants were observed in the May 12, 2021 survey. The May 2021 survey was appropriately timed to observe potentially occurring early-blooming special status plants such as Howell's montia (*Montia howellii*), which has been documented in similar roadside habitats. The July 26, 2021 survey was appropriately timed to observe the many later-blooming special status plants that have the potential to occur in the area, including western sand-spurrey. Point Reyes salty bird's-beak was discovered on July 26, 2021 in a small relatively confined population of approximately 100 plants and was just beginning to bloom, see Figure 3 within Appendix C for the location of the observed population, and Appendix G within Appendix C for the Botanical Technical Memo. The floristic survey that occurred on July 26, 2021 was conducted during a negative ocean tide of -1.1 feet, which was appropriate for surveying eelgrass, and none was found rooted in the BARSA. An additional survey occurred on May 18, 2022 throughout a portion of the BARSA; no special status plants were observed during the May 2022 survey. Surveys were appropriately timed for the blooming period, which appeared to have shifted slightly earlier this year likely due to the dry and warm conditions.

Although preliminary Project design indicates that no construction or other Project activities would occur within the observed Point Reyes bird's-beak community, the following mitigation measure is proposed to ensure avoidance of potential significant impacts to the observed special status plant community.

Mitigation

Mitigation Measure BIO-1 would reduce the potential impact of the Project on the observed special status plant community by the below-listed actions.

Mitigation Measure BIO-1: Pre-construction Survey for Point Reyes bird's-beak

- A seasonally appropriate pre-construction survey for Point Reyes bird's-beak shall be performed by a qualified botanist and shall occur prior to construction within the planned area of disturbance, during the appropriate blooming time (which is June through October for this species, however this species was observed blooming in May). If the pre-construction survey determines that Point Reyes bird's-beak (or a different special status plant) is present within the area of disturbance, these plants shall be avoided to the extent feasible. If avoidance is not feasible, they shall be conserved by measures appropriate for the individual species which may include methods such as plant relocation, seed collection, and/or nursery plant propagation.
- If plant relocation is utilized for Point Reyes bird's-beak, it shall be removed using hand tools and stored in a basin (containers) for no longer than two weeks within the Project Area where it will receive adequate sunlight and water. The plants shall be planted using hand tools as soon as possible in the vicinity of where they were removed.

With inclusion of Mitigation Measure BIO-1, potential impacts to special status plants will be avoided and this potential impact is considered less than significant.

Special Status Mammals

The Project centers around existing roadways, tidally influenced marsh and adjacent wetlands, and is predominantly surrounded by industrial, commercial and residential development. The PSB does not provide suitable habitat for special status mammals (GHD 2022a). No special status mammal species were observed in the PSB during reconnaissance level surveys or technical surveys; however, focused wildlife surveys were not conducted in the PSB (GHD 2022a). The BRE did not identify any special status mammalian species with moderate or high potential to occur in the PSB based upon database searches and baseline conditions within the PSB (which includes the BARSA).

It is expected that common, anthropogenically adapted mammalian wildlife species would be most likely to thrive in the PSB (e.g., Raccoons [*Procyon lotor*], Striped Skunks [*Mephitis mephitis*], Black-tailed Deer [*Odocoileus hemionus columbianus*], etc.). Given the existing development and associated habitat fragmentation along the vegetated corridor surrounding Palco Marsh, mammals that require large home ranges of undisturbed habitat are not likely to occur and any potential impact would be less than significant.

Special Status Bats

Habitat for bats (tree cavities, loose bark, riparian forest, creek crossing, bridges, infrastructure with cavities, etc.) is not present in the PSB (based on site visits). Additionally, no trees would be removed under the Project, and no bridges or other infrastructure with cavities would be modified. Therefore, construction of the Project would cause no impact to special status bats.

Project operation would not include new sources of light; therefore no operational impact to special-status bats would occur.

Special Status and Migratory Birds

The BRE identified that suitable nesting and/or foraging habitat is present within the PSB for several special status bird species, and that nesting birds are expected to be present in the PSB during the nesting season (March 15 through August 15). It should be noted that database searches yielded the potential for additional bird species to occur within the Project vicinity, however no suitable habitat exists within or adjacent to the PSB for these species, and therefore the Project would have no impact on these species. These species include: California Ridgway's Rail (*Rallus obsoletus obsoletus*, federally and state endangered), Marbled Murrelet (*Brachyramphus marmoratus,* federally threatened, state endangered), Northern Spotted Owl (*Strix occidentalis caurina,* federally and state threatened), Western Snowy Plover (*Charadrius nivosus nivosus*; federally threatened, CDFW Species of Special Concern [SSC]), short-tailed albatross (*Phoebastria albatrus*; federally and state endangered.

According to the BRE, which included a review of recent CNDDB and eBird records from the one-quad search area, the following species have potential to occur in the PSB based on existing habitat, recent nearby records, and a consideration of the species' natural history:

- Great Egret (*Ardea alba*; CDFW Special Animals List [SAL])
- Great Blue Heron (*Ardea Herodias;* SAL)
- Northern Harrier (*Circus hudsonius*; CDFW SSC)
- Yellow-billed Cuckoo (*Coccyzus americanus;* federally threatened)
- Snowy Egret (*Egretta thula*; SAL)
- White-tailed Kite (*Elanus leucurus*; CDFW Fully Protected [FP])
- Black-crowned Night Heron (*Nycticorax nycticorax;* SAL)
- Bank Swallow (*Riparia riparia*; state threatened)

Of the species listed above, all but Northern Harrier, Snowy Egret, and occasionally Black-crowned Night Heron, nest in trees. No trees are to be removed under the Project, however vegetation (such as salt marsh grasses and herbaceous plants) is anticipated to be removed during Project work within Palco Marsh and at the Clark Slough outfall at Washington and Koster Streets. Therefore, construction activities may adversely impact ground nesting species via clearing and grubbing of vegetation, and construction related noise and/or visual disturbance (from ground disturbance) may also adversely impact tree nesting birds. Potential Project-related impacts to special status and protected migratory birds (if any) would be reduced through the implementation of Mitigation Measure BIO-2.

Mitigation

Mitigation Measure BIO-2 would reduce the potential impact of the Project on special status and protected migratory birds via implementation of the below-listed actions.

Mitigation Measure BIO-2: Protect Special Status, Migratory and Nesting Birds

- Ground disturbance and vegetation clearing shall be conducted, if possible, during the fall and/or winter months and outside of the avian nesting season (which is generally assumed to occur between March 15 – August 15) to avoid any direct effects to special-status and protected birds. If ground disturbance or vegetation clearing cannot be confined to the fall and/or winter outside of the nesting season, a qualified ornithologist shall conduct pre-construction surveys within the PSB and immediate vicinity, to check for nesting activity of native birds and to evaluate the site for presence of raptors and special status bird species. The ornithologist shall conduct at minimum a one-day pre-construction survey within the seven-day period prior to vegetation removal and ground-disturbing activities. If ground disturbance and vegetation removal work lapses for seven days or longer during the nesting season, a qualified ornithologist shall conduct a supplemental avian pre-construction survey before project work is reinitiated.
- If active nests are detected within the construction footprint or immediately adjacent to construction activities within the Project Area, the ornithologist shall flag a buffer around each nest. Construction activities shall avoid nest sites until the ornithologist determines that the young have fledged or nesting activity has ceased. In general, the buffer size for common species would be determined on a case-by-case basis in consultation with the CDFW and, if applicable, with USFWS. Buffer sizes would take into account factors such as (1) noise and human disturbance levels at the construction site at the time of the survey and the noise and disturbance expected during the construction activity; (2) distance and amount of vegetation or other screening between the construction site and the nest; and (3) sensitivity of individual nesting species and behaviors of the nesting birds.

With the implementation of Mitigation Measure BIO-2, potential impacts to special status and protected migratory birds would be reduced to a less-than-significant level,

Special-status Amphibian and Reptile Species

The majority of aquatic resources within the PSB are tidally influenced and would therefore not provide suitable habitat for most special status amphibians and reptiles. Areas of the PSB which provide freshwater or freshwater-dominant wetlands include Wetland 1 (W1), the northwest corner of Palco Marsh (W2) (see Figure 5.1 in Appendix A), and Clark Slough (see Figure 5.2 in Appendix A). Wetland 1 and Clark Slough are located upstream of tide gates and are assumed to be predominantly freshwater aquatic resources. The northwest corner of Palco Marsh (W2) receives stormwater from the existing stormwater outfall, and therefore intermittently and seasonally contains freshwater-dominant wetlands in the immediate vicinity of the outfall during the wet season (which is assumed to be early November through late May). A study of California Red-legged Frogs (which was formerly a subspecies of Northern Red-legged Frog) published in 1999 concluded that tadpoles are not typically found in areas where salinity is 6.6 ppt or greater and typically die when exposed to salinity levels of 7.5 ppt or greater (Reiss 1999). This particular study observed that adult California Red-legged Frogs were primarily observed in areas with water salinity between 2.7 and 2.14 ppt, and that they prefer to lay eggs in warmer water and that saline concentration is less of a factor than water temperature; adult frogs were likely to be found in deeper water after egg laying (Reiss 1999). All egg mass sites tested had relatively low salinity levels, with the highest observed at 3.8 ppt (Reis 1999). Mortality of egg larvae has been recorded with prolonged exposure to salinity concentrations of 4.5 ppt (Reis 1999).

Salinity concentrations within Palco Marsh ranged from 29.1 to 30.5 ppt during April 27, 2022 fisheries monitoring and water quality sampling (RTA and Cal Poly Humboldt 2022). Approximately 3.07 inches of precipitation had fallen in the 14 days prior to water quality sampling, and of that total 0.44 inches had fallen within the 7 days prior to water quality sampling (NOAA 2022). Therefore, it’s unlikely that Northern Red-legged Frogs would be found in Palco Marsh during the construction window (June 15 – October 15) due to the dry weather and lack of freshwater inputs to create potentially suitable conditions. Clark Slough is a historically tidally influenced waterway, however currently lies approximately 0.25 miles upstream of a tide gate. Water quality monitoring during fisheries monitoring efforts on April 27, 2022 recorded salinities ranging between 13.9 ppt (at 0.5 feet) and 28.5 ppt (at 3.0 feet) (RTA and Cal Poly Humboldt 2022). The salinity concentration suggests that tidal water is leaking into Clark Slough at an unknown concentration or frequency which reduces the likelihood of Northern Red-legged Frogs occurring in Clark Slough.

Implementation of the Project would not modify existing seasonally suitable habitat for Northern Red-legged Frogs within Palco Marsh due to the continued discharge of storm water into Palco Marsh, and within Clark Slough. The northern side of Palco Marsh already contains brackish marsh conditions due to this stormwater discharge outlet, and the Project would maintain a similar amount of brackish habitat within this area by maintaining the outlet location. Daily tidal influence into Palco Marsh from Humboldt Bay would be maintained, allowing salt marsh habitat to persist where currently present. These areas of habitat are saline-dominant (with intermittent freshwater inputs during the rainy season), and marginal in quality. It is likely that this species prefers other, more suitable habitat. Although this species is unlikely to occur within aquatic resources within the PSB, they may be located in areas of uplands during dispersal, and its presence cannot be completely ruled out. Construction-related impacts to Northern Red-legged Frog may occur, including injury or mortality as a result of crushing or burying from vehicle use and excavation/earth moving, and dewatering. To avoid impacts to Northern Red-legged Frogs, Mitigation Measure BIO-3 is proposed.

Mitigation Measure BIO-3: Protect Special Status Amphibians

- No more than one week prior to commencement of ground disturbance within 50 feet of suitable amphibian habitat, a qualified biologist shall perform a pre-construction survey for Northern Red-legged Frogs and shall relocate any individuals or egg masses that occur within the work-impact zone to nearby suitable habitat.
- In the event that a Northern Red-legged Frog is observed in an active construction zone, the contractor shall halt construction activities in the immediate area where observed and the frog(s) shall be moved to a safe location in similar habitat outside of the construction zone.

With inclusion of Mitigation Measure BIO-3, potential impacts to special status amphibians or reptiles, namely Northern Red-legged Frog, would either be avoided or minimized, resulting in a less than significant impact.

Special Status Fish

There is marginal aquatic habitat present within the PSB (specifically the tidal channel south of the Del Norte Street pier connected to Humboldt Bay, Palco Marsh and Clark Slough) that has the potential to occasionally support some level of use by federally- and state-listed fish species. There are records of salmon caught off the immediately adjacent Del Norte Street Pier (Pier Fishing in California 2018) and nearby records of longfin smelt (Garwood 2017). However, regular presence of special status fish is not expected within the tidal channels, as water levels draw down considerably during low tide to expose the mudflat or channel bottoms with small, shallow, isolated pools. As mentioned, Clark Slough is disconnected from Humboldt Bay via a tide gate, located approximately 0.25 mile downstream from the intersection of Washington and Koster Streets, and is predominantly fed by stormwater runoff. Therefore Clark Slough does not contain water in it perennially and is considered an intermittent waterway. Fisheries sampling within Palco Marsh and Clark Slough, including field seine netting and laboratory eDNA methods indicate the absence of federally- and/or state-listed species including: Coho Salmon, Chinook Salmon, steelhead (collectively known as “salmonids”), and Tidewater Goby (RTA and Cal Poly Humboldt 2022). Additionally, field seine netting efforts did not detect Longfin Smelt, however eDNA analysis was not conducted on this species. Although potential to occur would be low, presence of the following federally- and/or state-listed or under review species in the tidal channel, Palco Marsh and Clark Slough cannot be completed discounted and thus is assumed: Longfin Smelt, Coho Salmon, Chinook Salmon, steelhead, Tidewater Goby, and CDFW SSC Pacific Lamprey (*Entosphenus tridentatus*).

Although it is unlikely that aquatic species would be within Palco Marsh, Clark Slough or the tidal inlet, Project construction would include dewatering of Palco Marsh and Clark Slough, and construction activities adjacent to Palco Marsh, Clark Slough and Humboldt Bay. Dewatering would occur in tandem with the low tide, i.e. the construction work area would be isolated during low tide which may preclude or significantly reduce the need to use pumps or other methods of dewatering except to dewater small, shallow, isolated areas. The isolated pools of water would be surveyed to determine whether aquatic species are present, and if so, they would be relocated into suitable habitat (within Humboldt Bay). It is assumed that no ESA or CESA-listed species would be relocated under the Project. The tidal inlet into Palco Marsh would be blocked at low tide with cofferdam(s) to prevent tidal water from entering Palco Marsh during construction within this area. A similar obstruction would be installed on the upstream and downstream sides of Clark Slough, if needed, to keep the area dry.

Potential impacts to special status fish and/or lamprey, if present in the PSB, may include injury, mortality, or disturbance as a result of increased levels of in-water sediment, and chemical or petroleum spills. Implementation of BMPs to reduce erosion, dust, and the potential for polluted run-off into receiving waters would be implemented to reduce impacts to fish and aquatic resources, as described in Mitigation Measure BIO-4.

Mitigation

Although eDNA sampling indicate the absence of Coho Salmon, Chinook Salmon, steelhead and Tidewater Goby (RTA and CalPoly Humboldt 2022), Mitigation Measure BIO-4 is recommended for implementation to reduce potential impacts to special status fish and lamprey, including aquatic habitat.

Mitigation Measure BIO-4: Protection of Special Status Aquatic Species and Aquatic Habitat

To minimize impacts to special status fish and lamprey species, the following avoidance and minimization measures are proposed:

- Silt fences and other erosion control measures shall be deployed along construction areas adjacent to Humboldt Bay, wetlands, and waters to prevent sediment input into these resources. If the silt fences are not adequately containing sediment, construction activity shall cease until remedial measures are implemented that prevent sediment from entering the waters below the construction area.

- Construction materials, debris, or dredge material, shall not be placed or stored where it could enter into aquatic resources.
- Fueling and equipment maintenance shall occur at least 100 feet away from wetlands and waterways.
- Prior to the start of construction activities, and if water is present within the Project construction limits, surveys for fish or lamprey species shall be conducted by a qualified biologist in pooled or moving water within the work area. If no water is present, no further actions related to surveys for species and relocation are required.
- If standing water and fish or lamprey species are identified, the fish or lamprey would be relocated to suitable habitat by a qualified fisheries biologist using seining and trapping procedures and an aerated bucket. It is assumed that no ESA- or CESA-listed species would be relocated. Non special status species would be relocated as feasible.
- Prior to the start of construction activities, a qualified biologist shall provide on-site worker environmental awareness training (tailboard) for crews at the commencement of construction. The training would include identification and life history of sensitive species, applicable regulations, species and habitat protection measures, fines and penalties, and procedures to be followed if sensitive species are observed on-site.

With incorporation of Mitigation Measure BIO-4, impacts to special status fish, lamprey and aquatic habitat (wetlands) would be reduced to a less-than-significant level.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service? (Less than Significant Impact)

Riparian Habitat

Riparian areas are those vegetated areas adjacent to rivers, streams, and lakes with specific overstory and/or understory plant species that meet the definition of riparian by the CDFW. Riparian habitat is important to stream health and watershed function due to the runoff and nutrients it filters, cooling effect it has on water temperatures, input of wood and organic debris which acts as strata for macroinvertebrates (one of the fundamental blocks of a healthy food web for many aquatic species), channel structure and input of woody debris to enable natural geomorphological changes. The PSB does not include freshwater rivers or streams, rather it includes tidally influenced inlets and salt marsh which supports herbaceous salt-tolerant vegetation. Some woody species, such as willows (*Salix sp.*) occur at the northern margin of Palco Marsh, adjacent to Del Norte Street. However, no trees would be affected by the Project. Due to the absence of riparian habitat within the Project footprint, the Project would have no impact on riparian habitat.

Sensitive Natural Community Habitat

One SNC, Northern Coastal Saltmarsh, occurs within the PSB within Palco Marsh. The potential for eelgrass to occur within the PSB was investigated. However, eelgrass was not observed in the tidal inlet during the July 26, 2021 site visit, although floating fragments were present (likely carried into the channel by currents in the bay) (see Photo 14 in Appendix F within Appendix C).

Within the Northern Coastal Saltmarsh SNC, a dominance of invasive dense-flowered cordgrass (*Spartina densiflora*) was observed throughout Palco Marsh within and adjacent to the PSB. Implementation of the Project would not affect the spread of cordgrass because any cordgrass that became dislodged during construction would be disposed of properly (see Section 1.8 for more details). Temporary impacts to this SNC are anticipated during excavation and site preparation (clearing and grubbing) due to the removal of vegetation and ground disturbance. A tidal channel would be excavated within Palco Marsh, extending north from an existing channel that would be enhanced and deepened (see Figure 2.3 in Appendix A). Standard construction BMPs would be implemented to reduce potential sediment input into Palco Marsh in accordance with the Project's SWPPP, as stated in Environmental Protection Action 1.

Following construction, this area would store a greater amount of freshwater during storm events, to be sourced from the existing storm water outlet location at Del Norte Street. The northern side of Palco Marsh already contains brackish marsh conditions due to this outlet, and the Project would maintain a similar amount of brackish habitat within this area by maintaining the outlet location. Daily tidal influence into Palco Marsh from Humboldt Bay will be maintained, allowing salt marsh habitat to persist where currently present. Because Palco Marsh is also an aquatic resource (in addition to being an SNC), impacts to it are considered within question c of this ISMND. Due to the temporal nature of impacts to this SNC which would be reduced through the use of standard construction BMPs to protect water quality under the Project's SWPPP, and because the Project would not result in a conversion of this SNC, a less than significant impact would occur.

c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? (Less than Significant Impact with Mitigation)

Aquatic resources, which is inclusive of wetlands (Palco Marsh), an inlet of Humboldt Bay and Clark Slough, were delineated within the PSB on May 11, 24, 27 and July 26th 2021. An additional area was added to the PSB which was delineated on May 18, 2022. The PSB contains four three-parameter wetlands, one two-parameter wetland, a tidal inlet of Humboldt Bay, and a historically tidally influenced ditch (Clark Slough) were observed. In total, there are 4.90 acres (213,575 ft^2) of three parameter wetlands, and 0.02 acre (930 ft^2) of two-parameter wetlands, 1.00 acre (43,350 ft^2) of land and water are below the observed high tide line of the Humboldt Bay tidal inlet, and 0.09 acre (4,095 ft^2) of land and water are below the Ordinary High Water Mark of Clark Slough (which is thought to be freshwater dominant). All delineated aquatic resources drain into Humboldt Bay, a navigable waterway, therefore the wetlands and tidal inlets are all assumed to be USACE and Regional Board jurisdictional, as well as either Coastal Commission or City of Eureka jurisdictional due to their location in the Coastal Zone.

In general, aquatic resources are all tidally influenced, except for Wetland 1 (two-parameter wetland), which drains stormwater into the adjacent tidal channel, and Clark Slough (at Koster and Washintong Streets) which is located approximately 0.25 mile upstream of a tide gate. However, the tide gate in Clark Slough may be leaking due to salinity concentrations ranging between 14 and 28 ppt during April 2022 monitoring. Further development of the Project's anticipated disturbance area determined that Wetland 1 would be located outside of the Project's disturbance area and would not be affected by the Project. The majority of aquatic resources are located adjacent to Humboldt Bay and south of Del Norte Street. See Figures 5.1 and 5.2 in Appendix A for all delineated aquatic resources.

Based on the 65% design, the Project would directly impact two delineated wetlands (Palco Marsh and Clark Slough) via the replacement of the storm drain outfall into Humboldt Bay, installation of the TCDs at the Del Norte Street/Palco Marsh intersection, and Koster and Clark Slough, Palco Marsh channel excavation, and potentially could indirectly impact the remaining aquatic resources via construction-related runoff. As stated in Environmental Protection Action 1, the Project would be constructed under a SWPPP which is required under the Construction General Permit. The SWPPP would include BMPs to be implemented to protect water quality from construction-related runoff or debris. Incorporation of Environmental Protection Action 1, would avoid or minimize indirect impacts to wetlands and other waters (tidal inlet and Clark Slough) and would result in a less than significant impact.

Construction within Palco Marsh includes approximately 700 feet of new channel excavation and enhancement of approximately 850 feet of an existing downstream channel (that is connected to the proposed channel), which would result in a direct temporary impact to this aquatic resource. Temporary impacts would be restored to pre-Project conditions following construction. However, some permanent impacts would also occur under the Project. The replacement of the storm drain outfall and implementation of the TCD at the Del Norte Street to Palco Marsh would result in approximately 350 ft^2 of fill of 3-parameter wetlands, and installation of the TCD at the outfall to Clark Slough would result in approximately 150 ft^2 fill below the Ordinary High Water Mark. Permanent fill of an aquatic resource would be a significant impact, and Mitigation Measure BIO-5 (below) is proposed to reduce this impact.

In 1987 a study was conducted by Annie Eicher (Eicher, 1987) to document the relationship of inter-tidal salt marsh vegetation with elevation in Humboldt Bay (Exhibit 3-1). The persistence of salt marsh vegetation is primarily a function the species tolerance to frequency and duration of tidal inundation. The data collected by Eicher in open intertidal habitats has been used to project salt marsh vegetation recruitment based on muted tidal inundation frequency for local muted tidal restoration projects including Salmon Creek Restoration Project at the Humboldt Bay National Wildlife Refuge, the Wood Creek Tidal Enhancement Project in Freshwater, and the Martin Slough Enhancement Project within the City of Eureka, all tributaries to Humboldt Bay.

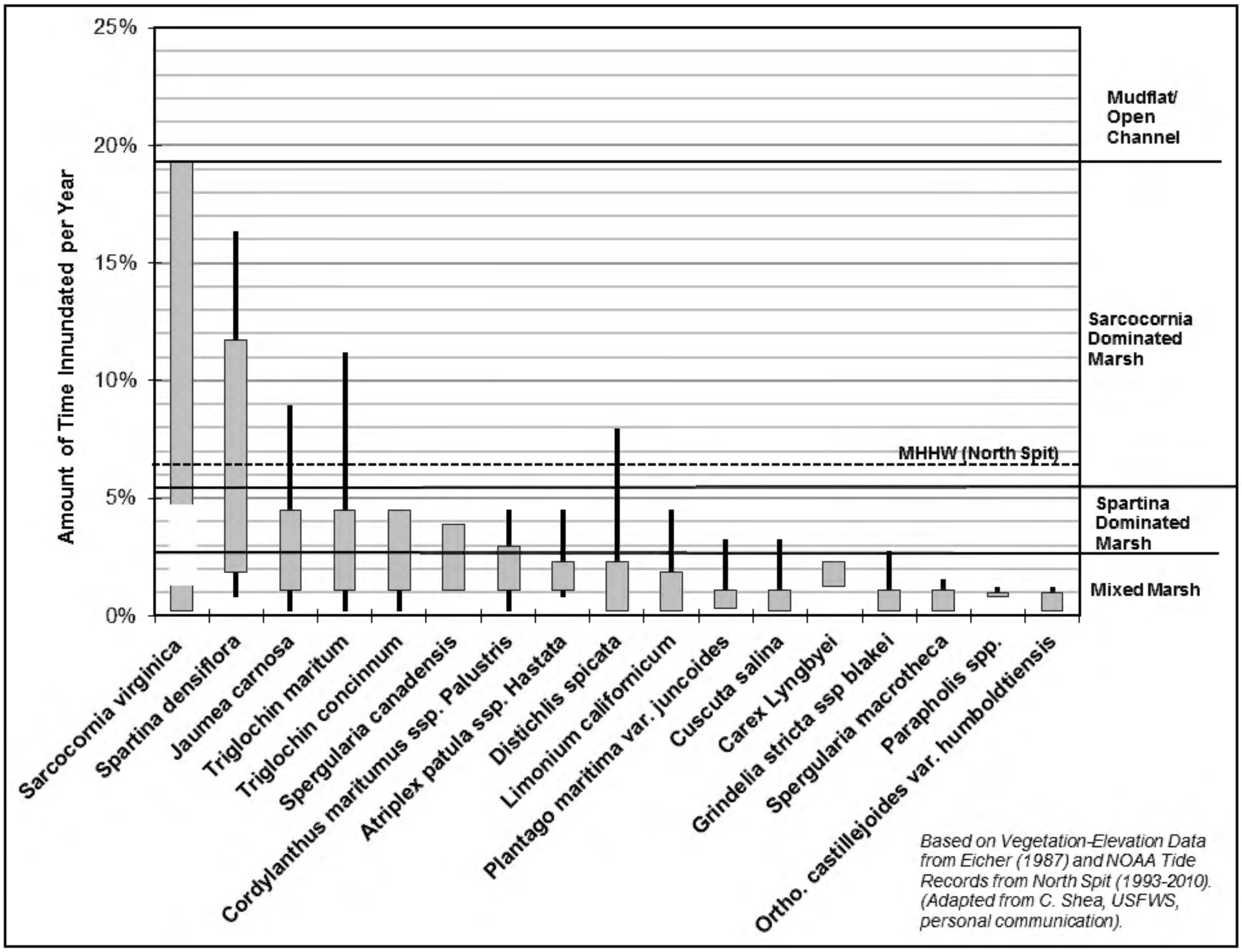

Exhibit 3-1 Relationship between inundation percentage and salt marsh vegetation (Eicher 1987)

Eicher (1987) concluded for Humboldt Bay that mudflats and tidal channels are inundated over 19 percent of the time and no salt marsh species are present at these low elevations. *Sarcocornia* dominated marshes are inundated between 5 and 19 percent of the time, and are characterized with the presence of only four other species. *Spartina* dominated marshes, at a slightly higher elevation, is inundated between approximately 3 and 5 percent of the time and up to ten other marsh species are present, though *Spartina* dominates. Mixed marshes, inundated less than 3 percent of the time, have the greatest species diversity with the presence of 22 species, with no individual species dominating. *Sarcocornia* is present in the mixed marshes, but not present in the *Spartina* dominated marshes. Eicher speculated that the invasive *Spartina* out-competes *Sarcocornia*, resulting in a gap in its representation at middle elevations. This out-competition is often seen in marshes throughout Humboldt Bay.

A comparison between the existing and proposed inundation regimes in Palco Marsh can be used to indicate whether or not changes would be expected in salt marsh species assuming no significant changes to marsh plain elevations. The tidal range within Palco Marsh is muted, typically between elevation 3 ft and 5.3 ft when water levels in Humboldt Bay range from 0 ft to 6.5 ft and is controlled by the inverted siphon crossing (Exhibit 3-2). This conveyance structure will be replaced with a larger, similar structure with tide gates mounted on rails for vertical adjustment to allow for adjustable muting of tidal exchange. The Project tide gate elevations have been modeled and adjusted to identify the configuration for which existing peak water levels and flood tide rates will be maintained. On the ebb tide, the full capacity of the structure is utilized to more closely match unobstructed tidal hydraulics (Exhibit 3-2). The resulting tidal inundation duration is therefore similar to existing and would not be expected to change vegetative communities. Following construction, water levels can be monitored within Palco Marsh and the adjustable tide gates will be set to maintain inundation regimes.

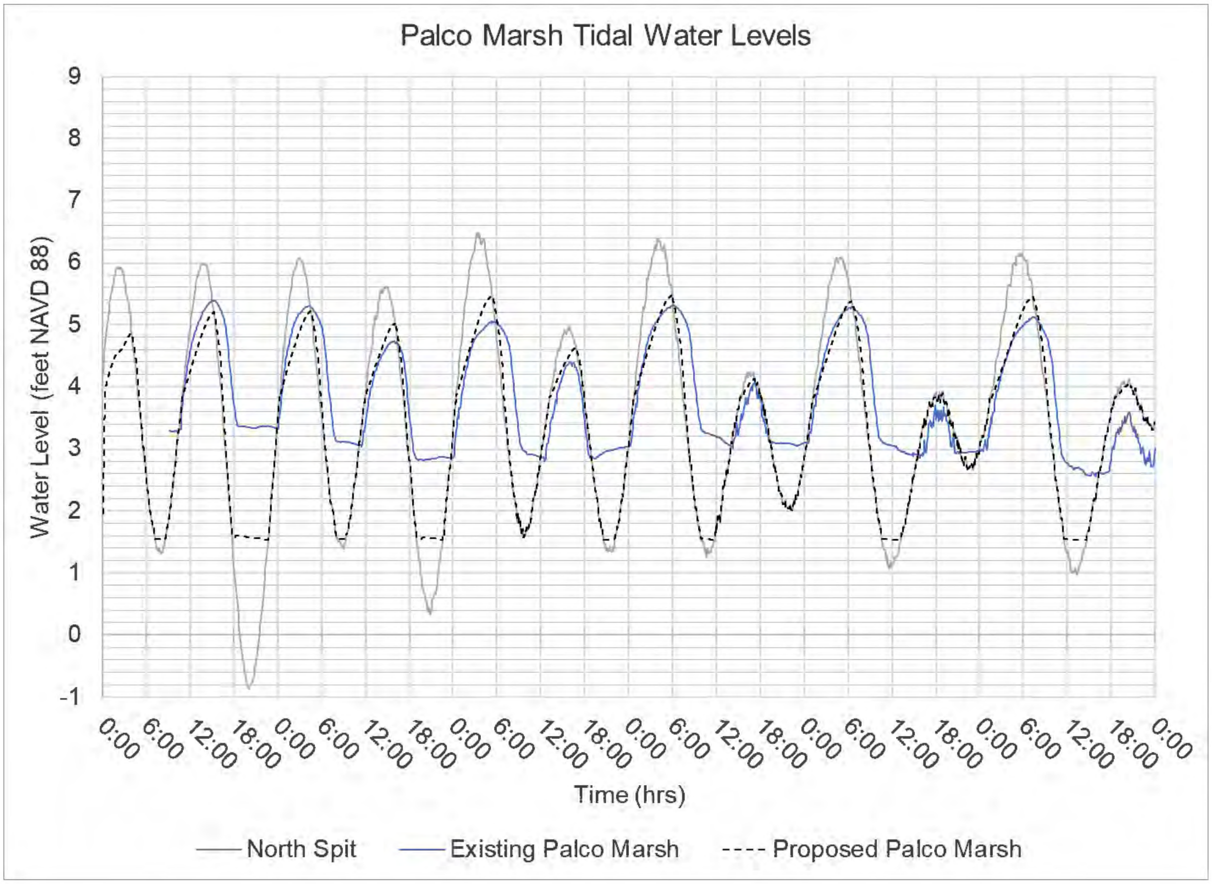

Exhibit 3-2 Existing and proposed water levels within Palco Marsh compared to existing tidal water levels in Humboldt Bay at the North Spit gage.

Prior to anthropogenic modifications, Palco Marsh was part of a larger salt marsh network along the Humboldt Bay shoreline. With the construction of the railroad, the marsh area was disconnected from Humboldt Bay tidal sediment sources (Exhibit 3-3). Salt Marsh elevations are typically coincident with a small range above and below Mean Higher High Water (MHHW). MHHW at the open tidal location of the Palco Marsh to Humboldt Bay crossing is 6.5 ft (NAVD 88). Salt marsh areas of Palco Marsh typically exhibit an elevation between 5 and 6 feet (NAVD 88) suggesting land subsidence and lack of mineral sediment deposition (Exhibit 3-4). Several areas of the historical marsh plain within Palco Marsh have transitioned from salt marsh to mudflat due to the compounding effects from land subsidence and lack of sediment supply to maintain marsh elevations. Cascadia Geosciences documented that the Humboldt Bay area, including Palco Marsh, is subsiding due to plate tectonics (Cascadia GeoSciences, 2017). USGS conducted a study of Humboldt Bay salt marshes noting that increases to sediment supply, as a result of climate projections of increased precipitation and streamflow may partially or wholly mitigate sediment demand caused by the combined effects of subsidence and sea level rise (USGS, 2021). However, historic isolation of Palco Marsh and limited tidal exchange through the existing crossing does not provide equivalent availability of sediment compared to salt marshes experiencing the full tidal range in Humboldt Bay. Therefore Palco Marsh is not anticipated to receive the amount of sediment to counteract tectonic subsidence. This phenomenon would occur independent of the Project, however placement of excavated materials within the Project footprint would slow this transition (described below).

As sea levels rise, the tidal range within Humboldt Bay and Palco Marsh will shift up in elevation, increasing the duration of inundation on the marsh plain. Without adequate sediment supply or intervention, salt marshes risk converting to mudflat. Excavated soils from the proposed channel would be placed in areas within Palco Marsh that were historically salt marsh and have transitioned to mudflat or would be used to increase the elevation of lower elevation salt marsh to prolong the life of the salt marsh habitat with additional sea level rise.

Replacement of the existing crossing from Palco Marsh to Humboldt Bay would provide additional hydraulic control to manage Palco Marsh for salt marsh habitat. Additionally, in the absence of available sediment accretion on the marsh, the crossing has the ability to be adjusted to maintain current water levels under future sea level rise conditions. Future sea level rise retreat strategies, such as expansion of tidal marsh habitat adjacent to Palco Marsh, would require increased tidal conveyance at the crossing to provide adequate hydraulics, which would be achieved with the proposed crossing structure and adjustments to the tide gate elevations. Therefore, the proposed Project is aiding in future sea level rise adaptation planning.

Exhibit 3-3 (Left) 1870 U.S. Coast Survey Map, (Right) Palco Marsh – 1931 (image source: Laird et al. (2007): Historical Atlas of Humboldt Bay and Eel River Delta.

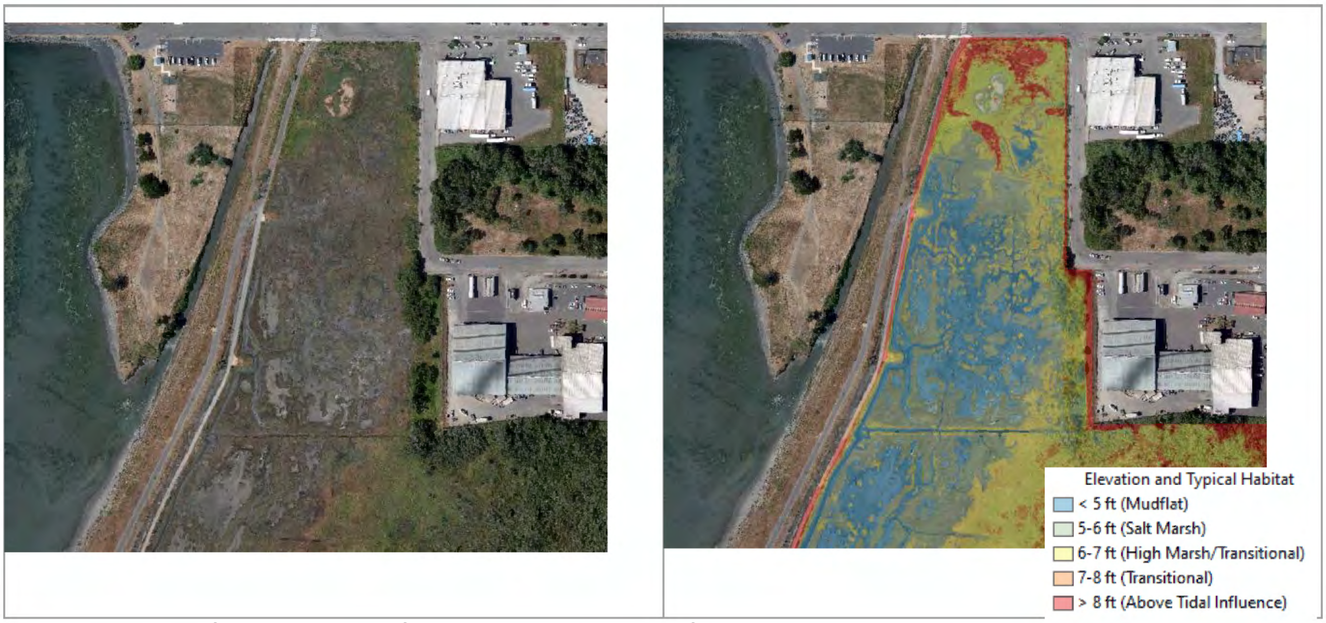

Exhibit 3-4 (Left) aerial imagery of Palco Marsh showing mud flat area where salt marsh once persisted, (Right) elevation and habitat relationships.

Following construction, Palco Marsh would continue to function as an aquatic resource utilizing the same general flow pathways that currently exist. No operational impact to wetlands or Other Waters would occur because any potential maintenance within Palco Marsh or another wetland or inlet would involve removal of jammed debris at a culvert, or removal of trash, and would not result in wetland fill or modification of flow pathways. Therefore, a less than significant impact would occur during Project operation.

Mitigation Measure BIO-5: Mitigate for Impacts to Aquatic Resources

- Aquatic resources that are permanently filled shall be mitigated for at least at a 1:1 ratio. Mitigation may also include other restoration components, such as removal of invasive vegetation, per discussions with the Coastal Commission.
- Mitigation shall occur within the Project Area if feasible, or on suitable City-owned property outside of the Project Area. Mitigation for impacts to aquatic resources shall be achieved at a ratio to be determined in conjunction with regulatory agencies, but not less than 1:1.
- Aquatic resources that are temporarily impacted shall be restored to pre-Project conditions, which may include planting of CA native vegetation where vegetation was removed.

With inclusion of Mitigation Measure BIO-5, impacts to aquatic resources would be mitigated, resulting in a less than significant impact.

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites? (No Impact)

Wildlife movement corridors are areas that connect suitable wildlife habitat in a region otherwise fragmented by rugged terrain, changes in vegetation, or human disturbance. Natural features such as canyon drainages, ridgelines, peninsulas, or areas with vegetative cover provide wildlife corridors. Wildlife movement corridors are important because they provide access to mates, food, and water; allow the dispersal of individuals away from high population density areas and facilitate the exchange of genetic traits between populations.

The PSB is located within the Pacific Flyway for migratory birds. Palco Marsh provides suitable natural habitat that would support high levels of migratory species stopover use, breeding, or wintering. Palco Marsh extends south and east of the PSB, and although construction would occur in the northwest portion of Palco Marsh, available habitat outside of the construction area would remain accessible to migrating birds. No impact to avian migration corridors would occur.

Aquatic habitat within the PSB is tidally influenced, with the exception of Wetland 1, located adjacent to a tidal channel near the Eureka Dog Park parking lot and outside of the Project disturbance footprint, as well as Clark Slough which is located approximately 0.25 mile upstream of a tide gate. As is visible in Palco Marsh, the tidal amplitude drops substantially during low tide resulting in mudflat conditions and/or isolated, shallow, ponded water, thereby preventing continuous use of this habitat by migrating fish species. Furthermore, the shallow, dynamic nature of the tidal channel, lack of channel complexity, and lack of connection to upstream habitat (storm drain pipe system) is expected to restrict use by special status fish species. Tidal connectivity between Humboldt Bay and Palco Marsh will be maintained. The Project would not modify existing aquatic migration conditions, and therefore would have no impact on migratory fish pathways.

In addition, no “essential connectivity areas,” “natural landscape blocks,” or “small natural landscape areas” that would support other sensitive species have been identified or mapped in the Project vicinity by the California Essential Habitat Connectivity Project (GHD 2022a).

Aquatic organism passage into and out of Palco Marsh is influenced by the velocity through the crossing. CDFW and NMFS fish passage velocity criteria range from 2 to 6 ft/sec for juvenile and adult salmonids, respectively. During tidal conditions, including the 85^{th} percentile higher high tide, over a 24-hour period, existing velocities meet juvenile fish passage conditions an average of 3.6 hours per day and meet adult conditions 12.1 hours per day (Table 3.4-1 and Exhibit 3-3). Under proposed conditions, juvenile fish passage conditions are met an average of 13.7 hours per day and adult conditions are met 23.5 hours per day. Fish passage design criteria for other listed aquatic dependent species such as Long-fin smelt and Tidewater Goby do not exist, however the reduction in velocity at the crossings will greatly improve access to Palco Marsh relative to existing conditions.

Table 3.4-1. Fish passage conditions met during a given 24 hour period are increased with replacement of existing crossing from Palco Marsh to Humboldt Bay.

Parameter	Existing	Proposed
Juvenile Fish Passage Conditions Achieved (average hrs/day) 2 ft/sec	3.6	13.7
Adult Fish Passage Conditions Achieved (average hrs/day) 6 ft/sec	12.1	23.5

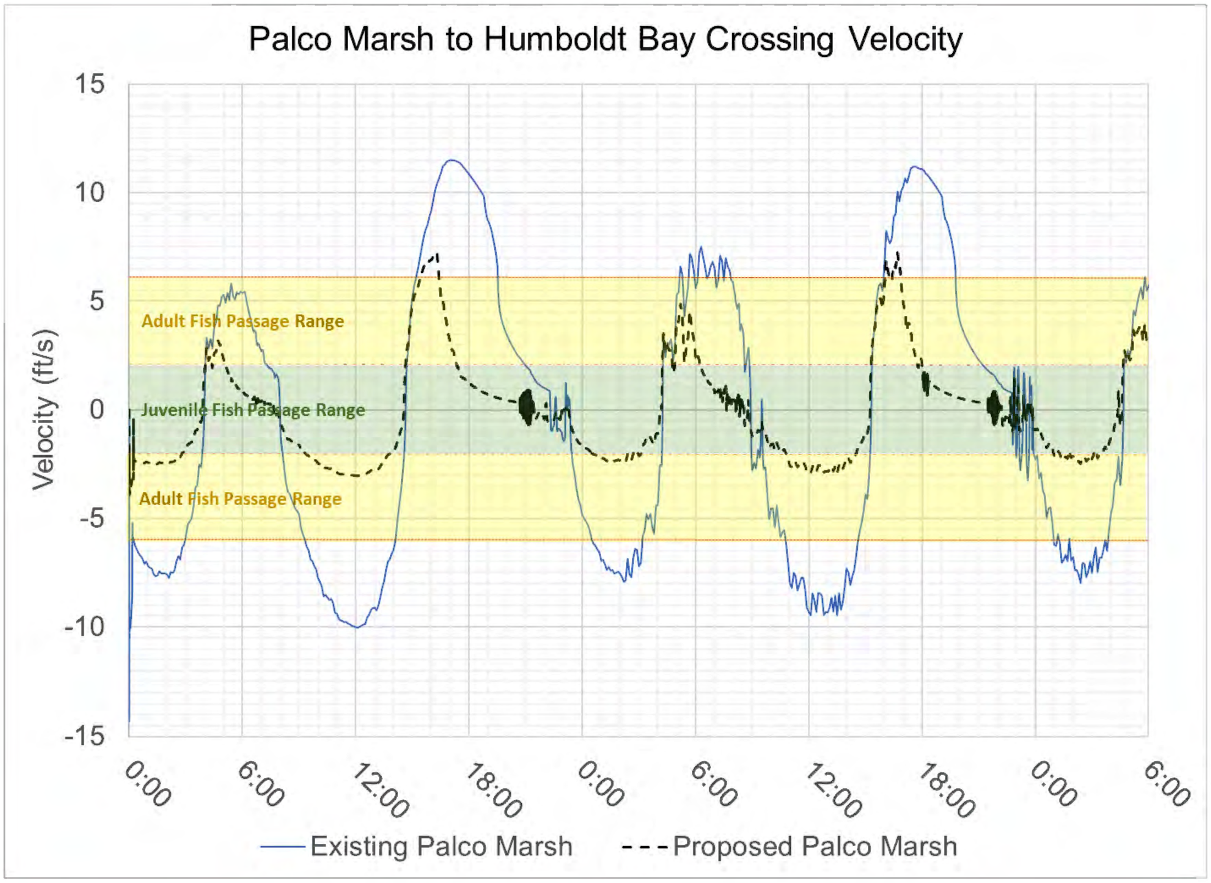

Exhibit 3-5 Existing and proposed velocities within the inverted siphon.

Due to the reasons stated above, the Project would have no impact on wildlife migration corridors.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? (No Impact)

The City of Eureka includes a number of policies to protect and enhance the natural qualities of the Eureka area's aquatic resources and to preserve the area's valuable marine, wetland, and riparian habitat (Land Use Plan policies 6.A.1, 6.A.3, 6.A.6, 6.A.7, 6.A.8, 6.A.13, 6.A.14, and 6.A.19). Similar policies found in the Eureka 2040 General Plan include NR-1.3, NR-1.4, NR-1.8, NR-2.1, NR-2.2, NR-2.3, and NR-2.4) The Project would not conflict with applicable City of Eureka 2040 General Plan or Local Coastal Plan policies protecting biological resources. No impact would result.

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan? (No Impact)

Currently there is not an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plans that cover the PSB. No impact would result.

3.5 Cultural Resources

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

In support of the Project, a Cultural Resources Investigation was prepared to evaluate cultural and historic resources potentially affected by the Project (Roscoe and Associates 2021), as well as a Cultural Resources Monitoring Report which occurred during the geotechnical boring investigations (Roscoe and Associates 2022). The Cultural Resources Investigation included a pedestrian survey of the Project's Area of Potential Effect (APE), and database searches of recorded archaeological and historic resources of the APE and within 0.5 miles of the APE. The Cultural Resources Monitoring Report included observations of soil borings within the vicinity of known archeological resources identified in the Cultural Resources Investigation, and concluded that no archaeological deposits were observed (Roscoe and Associates 2022). The findings and recommendations of the Cultural Resources Investigation and Cultural Resources Monitoring Report are used as the basis for cultural resources impact assessment. See Figure 2 (in Appendix A) for a location of the Project regions, which are referred to as particular APEs throughout this section.

a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5? (No Impact)

One potential historic resource was observed within the Railroad St and Staging Area Region APE, which includes three segments of the previously documented North Western Pacific Railroad located in the Commercial, 14 St. and Railroad Ave. Region APEs (Roscoe and Associates 2021). This resource is visible as a railroad track in pavement. The segments of this resource, as it passes through the APE, was previously recommended ineligible for the National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHR) in a previous report by Miller and Miller 2014. Roscoe and Associates concur with the ineligible listing determination. No modifications to the segments of railroad are proposed under the Project. Therefore, because the resources is not considered NRHP- or CRHR-eligible for listing and no Project work is proposed on the railroad segments, no impact would occur.

Operation of the Project does not include excavation or other ground disturbance work. Therefore, no potential impact to archaeological resources would occur during Project operation.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5? (Less than Significant Impact with Mitigation)

One historic-era archaeological site, the early 1900s Eureka City Dump, was noted to exist subsurface within a portion of the Railroad St and Staging Area Region APE. This site is associated with late 1800s City planning efforts, and is currently covered by pavement and other commercial infrastructure; this resource has not yet been documented comprehensively. The exact location and depth of the deposit, or if it is even present in the APE is unknown. (Roscoe and Associates 2021). Excavations are proposed in the Railroad St Region APE (but not within the Staging Area), which could unearth potential archaeological resources which has the potential to result in a significant impact. To avoid this potentially significant impact, it is recommended that an archaeological monitor be present during excavation within the Railroad St and Staging Area Region APE (which includes proposed work in the Palco Marsh), as described below in Mitigation Measure CR-1.

Two, or possibly three ethnographic archaeological sites were documented in the vicinities of the Commercial St, Washington St, Koster St, and Short St Region APEs (Roscoe and Associates 2021). Because excavations in the vicinity of documented sites would be conducted solely in previously excavated trench lines, no adverse impacts to potential archaeological resources are expected to occur. However, given known archaeological sites are present within portions of the APE, it is possible that archaeological resources may be incidentally discovered during excavation. During preparation of the Cultural Resources Investigation, communication with the Tribal Historic Preservation Officers (THPOs) from local tribes (Bear River Band of Rohnerville Rancheria, Blue Lake Rancheria, and the Wiyot Tribe) occurred, which resulted in actions to be taken prior to and during construction to avoid a potentially significant impact to archaeological resources. These actions are further discussed in Mitigation Measure CR-1, and include preparation of a monitoring plan to be reviewed by the THPOs listed above, and presence of an archaeological monitor within the Commercial St, Washington St, Koster St, and Short St Region APEs. Implementation of Mitigation Measure CR-1 would reduce this potentially significant impact to a less-than-significant level.

Although the approximate location of identified archaeological resources is known and potential impacts to these resources is accounted for via Mitigation Measure CR-1, there is the inherent potential for discovery of archaeological resources whenever excavation occurs. If archaeological resources were inadvertently discovered and not managed with care, a potentially significant impact could occur. Therefore, Mitigation Measure CR-2 would be implemented which would include construction worker training and inadvertent discovery protocols to be followed if a potential archaeological resource is discovered and would reduce this potentially significant impact to a less-than-significant level.

Operation of the Project does not include excavation or other ground disturbance work. Therefore, no potential impact to archaeological resources would occur during Project operation.

c) Disturb any human remains, including those interred outside of formal cemeteries? (Less than Significant Impact with Mitigation)

Based on results of Roscoe and Associates (2021), and the nature of the Project (excavation in previously disturbed areas), discovery of human remains is not considered likely to occur. However, in the event human remains are encountered during construction, Mitigation Measure CR-3 would be implemented to ensure any potential impact would be less than significant.

Mitigation

Implementation of Mitigation Measures CR-1, CR-2 and CR-3 would reduce the potential impact to archaeological resources or human remains by requiring the preparation of a draft monitoring plan and presence of archaeological monitors for archaeologically sensitive areas, construction worker training and procedures that shall be taken in the event of inadvertent discovery or archaeological resources or human remains.

Mitigation Measure CR-1: Minimize Impacts to Archaeological Remains if Encountered

Archaeological monitors shall be present during construction within the Railroad St and Staging Area, Commercial St, Washington St, Koster St, and Short St Region APEs. The archaeological monitor shall meet the Secretary of Interior's Professional Qualifications Standards for Archaeology (Title 36 Code of Federal Regulations Part 61, and 48 Federal Regulation 44716). Prior to project implementation a monitoring plan should be drafted and reviewed by the THPOs of the Bear River Band of Rohnerville Rancheria, the Blue Lake Rancheria, and the Wiyot Tribe. The monitoring plan shall include the stipulation that if archaeological materials associated with a Wiyot ancestral site are identified during monitoring, then the THPOs from the three Wiyot groups shall be immediately notified and allowed to provide a Tribal Cultural Monitor, if they so choose. The monitoring plan shall include the historic-era archaeological site documented in the Railroad St and Staging Area Region APE as well.

Mitigation Measure CR-2: Implement Worker Sensitivity Training and Inadvertent Discovery Protocols

If archaeological resources are encountered during construction activities, all onsite work shall cease in the immediate area and within a 50-foot buffer of the discovery location. A qualified archaeologist shall be retained to evaluate and assess the significance of the discovery, and develop and implement an avoidance or mitigation plan, as appropriate. For discoveries known or likely to be associated with native American heritage (prehistoric sites and select historic period sites), the Tribal Historic Preservation Officers for the Bear River Band of Rohnerville Rancheria, Blue Lake Rancheria, and Wiyot Tribe are to be contacted immediately to evaluate the discovery and, in consultation with the project proponent, City of Eureka, and consulting archaeologist, develop a treatment plan in any instance where significant impacts cannot be avoided. Prehistoric materials may include obsidian or chert flakes, tools, locally darkened midden soils, groundstone artifacts, shellfish or faunal remains, and human burials. Historic archaeological discoveries may include 19th century building foundations; structural remains; or concentrations of artifacts made of glass, ceramic, metal or other materials found in buried pits, old wells or privies.

Mitigation Measure CR-3: Minimize Impacts to Human Remains if Encountered

In the event of discovery or recognition of any human remains during construction activities, the landowner or person responsible for excavation would be required to comply with the State Health and Safety Code 7050.5. Construction activities within 100 feet of the find shall cease until the Humboldt County Coroner has been contacted to determine that no investigation of the cause of death is required. If the remains are determined to be, or potentially be, Native American, the landowner or person responsible for excavation would be required to comply with Public Resources Code Section 5097.8. In part, PRC Section 5097.98 requires that the Native American Heritage Commission (NAHC) shall be contacted within 24 hours if it is determined that the remains are Native American. The NAHC would then identify the person or persons it believes to be the most likely descendant from the deceased Native American, who in turn would make recommendations to the landowner or the person responsible for the excavation work for the appropriate means of treating the human remains and any associated grave goods within 48 hours of being granted access to the site. Additional provisions of Public Resources Code Section 5097.98 shall be complied with as may be required.

Implementation of Mitigation Measures CR-1, CR-2 and CR-3 would reduce potential impacts related to inadvertent discovery of cultural resources and human remains to a less than significant level.

3.6 Energy Resources

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

a) Result in potentially significant environmental impacts due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation? (Less than Significant Impact with Mitigation)

Construction of the Project would involve a variety of earthwork and construction practices, involving the use of heavy equipment as discussed in Section 1.10 (Project Construction). Construction would require the use of fuels, primarily gas, diesel, and motor oil. Construction emissions were estimated using CalEEMod version 2020.4, and are estimated to be approximately 241.92 $MTCO_2e$ from all construction activities (Appendix B). The Project's construction emissions equal 8.06 $MTCO_2e$ per year when annualized over the assumed 30-year lifespan of the Project. Peak travel associated with Project construction would consist of approximately 28 trips (14 round-trips) per day for construction workers, and approximately 7 daily trips for material hauling over the course of the grading period (which is assumed to be June 15 -September 15). Excess soils and construction materials would be stored on-site within previously designated staging areas only. Excess soils of high quality may be re-used on-site for backfill and finished grading, however its anticipated that the majority of excess soils would be hauled offsite by the contractor for legal disposal and engineered fill will be used for backfill of trenches and structure excavations. Excess soils would not remain stockpiled on-site once the Project is complete. The contractor may haul additional excess soils off-site for legal use at other permitted sites. Drill spoils would be collected via vacuum trucks and hauled from the site by the contractor for legal disposal. Any additional consumption of energy to support off-site hauling would not be required.

Inefficient construction-related operations would also be avoided due to the measures in Mitigation Measure AQ-1 (BMPs to Reduce Air Pollution). Equipment idling times would be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes or less (as required by Mitigation Measure AQ-1). Because construction would not encourage activities that would result in the use of large amounts of fuel and energy in a wasteful manner, and with the incorporation of Mitigation Measure AQ-1 which would reduce idling time, impacts related to the inefficient use of construction-related fuels would be less than significant with mitigation.

Operation of the Project would include periodic maintenance of infrastructure, including inspections, structural repairs, and general upkeep. These activities would generally be supported by vehicles and use of hand-held tools. The use of fossil-fuel powered equipment to support these operational and maintenance activities would be periodic and short-term (occurring intermittently). These activities would not result in a substantial increase in energy use, and would not result in inefficient, wasteful, or unnecessary consumption of fuels or other energy resources.

Operation and maintenance of the Project would not generate additional vehicle trips, above existing conditions. Therefore, the Project would not result in an increase in energy use above the existing conditions. The impact would be less than significant with the incorporation of Mitigation Measure AQ-1.

b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency? (No Impact)

The City does not have an adopted plan related to renewable energy or energy efficiency. The Project would not conflict with or inhibit the implementation of the State Energy Action Plan, SB 1389, SB 100, AB 1007, or other state regulations that are applicable to the Project because the Project would not inefficiently utilize energy. In regards to greenhouse gases and energy efficiency, Project facilities would comply with applicable state requirements, which is further discussed in Section 3.8 (Greenhouse Gas Emissions). The Project would temporarily require the use of construction equipment in order to construct the components of the Project; however, these activities would be temporary and would not interfere with the broader energy goals of the City or state. The Project would therefore not conflict with or obstruct a state or local plan for renewable energy or energy efficiency, as no component of the Project would require an energy source, beyond the temporary use of construction equipment, above existing operational energy consumption. No impact would result.

3.7 Geology and Soils

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

The Project would be located in a predominantly developed portion of coastal Humboldt Bay, where soils have been previously disturbed and large areas have been filled and compacted at the time of street construction and utility installation and are now covered by pavement. Unpaved areas of the Project include the Palco Marsh and Clark Slough. Palco Marsh is tidally influenced and is subject to the twice daily ebb and flow of tidal waters. Tidal flow to Clark Slough, within the PSB, is limited by a tide gate located near Waterfront Drive. Both surface level and subsurface soils would be disturbed under the Project.

a, i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42. (No Impact)

The Project site is not located within an active Alquist-Priolo fault mapped by the California Geological Survey (DOC 2022a; SHN 2022a) or earthquake fault zone. The nearest fault is the Little Salmon fault, located approximately 4.2 miles southwest of the Project. The North Spit fault is mapped approximately 1.6 miles to the southwest of the Project area, but is not considered active (SHN 2022a). The Project does not involve deep drilling. Given no known active faults run through the Project site, there would be no impact.

a. ii) Strong seismic ground shaking? (No Impact)

The Project is situated within a seismically active area close to several seismic sources capable of generating moderate to strong ground motions. The Little Salmon fault, as discussed above, is located approximately 4.2 miles to the southeast of the Project. It is considered active and may be capable of generating earthquakes in excess of magnitude M7 to 7.5.

There are other local sources capable of producing strong seismic shaking in the Project Area. These include the Cascadia subduction zone (approximately 35 miles west of the Project site, offshore), the Mad River fault zone (approximately 6.3 miles northeast of the Project site), and the Mendocino fault zone (approximately 40 miles southwest of the Project site, offshore). The North Spit fault (1.6 miles southwest of the Project) is not an active fault (SHN 2022a) and therefore is not considered capable of producing strong seismic shaking in the Project Area.

Because the Project is located within a seismically active area, the probability that strong ground shaking associated with large magnitude earthquakes would occur during the design life of the Project is high. Thus, the Project would be designed to resist moderate to very strong levels of seismic ground shaking without experiencing damage, consistent with recommendation from the geotechnical investigation (see Environmental Protection Action 2). However, the potential for seismic activity would be unaffected by construction and operation of the Project. Therefore, no impact would occur.

a. iii) Seismic-related ground failure including liquefaction? (No Impact)

Liquefaction is a phenomenon involving loss of soil strength, and resulting in fluid mobility through the soil. Liquefaction typically occurs when loose, uniformly-sized, saturated sands or silts are subjected to repeated shaking in areas where the groundwater is less than 50 feet below ground surface. In addition to the necessary soil and groundwater conditions, the ground acceleration must be high enough, and the duration of the shaking must be sufficient, for liquefaction to occur. Lateral spreading is defined as lateral earth movement of liquefied soils, or competent strata riding on a liquefied soil layer, downslope toward an unsupported slope face, or an inclined slope face (SHN 2022a).

The western portion of the Project near Palco Marsh consists of soils that have a high susceptibility for liquefaction and lateral spreading (SHN 2022a). This area of the Project consists largely of the drainage ditch within Palco Marsh as well as the outfall at Palco Marsh. Settlement from liquefaction in this area are expected to be between 2-6 inches. Settlement of this level would not affect the Project in a manner that would stop its overall function. Similarly, lateral spreading anticipated in this portion of the Project would not stop its overall function. However, Project implementation would not increase risk of liquefaction or exposure to liquefaction above existing conditions. Therefore, no impact would occur.

a.iv, c, d) Landslides, or otherwise unstable soils? (No Impact)

The Project Area is relatively flat and there is no evidence of slope instability noted in the geotechnical report (SHN 2022a) and there are no mapped landslides in the Project Area (DOC 2022a). Furthermore, the Project area does not have soils that are likely to be expansive as defined by the California Building Code, which is a plasticity index of greater than 15. Therefore, implementation of the Project would not increase the risk of landslides or otherwise unstable soils, and no impact would occur.

b) Result in substantial soil erosion or the loss of topsoil? (Less than Significant Impact)

Construction activities, including trenching, horizontal directional drilling, and operation of heavy machinery would disturb soil and, therefore, have the potential to cause erosion. Erosion and sediment control provisions prescribed in the City of Eureka Municipal Code, NCRWQCB regulations, and the Construction General Permit (which requires a SWPPP, as described in Environmental Protection Action 1) would be required as part of the Project. BMPs may include: silt fences, straw wattles, soil stabilization controls, site watering for controlling dust, and containerizing groundwater and soils that may be contaminated. These BMPs are designed to minimize potential erosion and water quality impacts to a less than significant level during construction and selectively post-construction such as near Palco Marsh and Clark Slough. Therefore, the potential soil erosion impact would be less than significant.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater? (No Impact)

The purpose of the Project is to replace existing storm water infrastructure to reduce the frequency of flooding and increase resiliency to sea level rise. The Project does not include, expand, or otherwise involve the use of septic tanks or other alternative wastewater disposal systems. Therefore, no impact would result.

f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? (Less than Significant Impact with Mitigation)

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

It is unlikely that Project construction would impact potentially significant paleontological resources because excavation would predominantly occur in previously filled and/or developed areas. It is possible that paleontological resources may be encountered in Palco Marsh due to the historical accretion of sediment over marine deposits. Should a paleontological resource be discovered a potentially significant impact could occur. Mitigation Measure GEO-1 is proposed which includes inadvertent discovery protocols of paleontological resources.

No earthwork is proposed during Project operation and therefore there is no potential for inadvertent discovery of paleontological resources during operation. No operational impact would occur.

Mitigation

Mitigation Measure GEO-1 would reduce the impact of construction activities on potentially unknown paleontological resources by addressing discovery of unanticipated buried resources and preserving and/or recording those resources consistent with appropriate laws and requirements.

Mitigation Measure GEO-1: Inadvertent Discovery of Paleontological Resources

In the event that fossils are encountered during construction (i.e., bones, teeth, or unusually abundant and well-preserved invertebrates or plants), construction activities shall be diverted away from the discovery within 50 feet of the find, and a professional paleontologist shall be notified to document the discovery as needed, to evaluate the potential resource, and to assess the nature and importance of the find. Based on the scientific value or uniqueness of the find, the paleontologist may record the find and allow work to continue, or recommend salvage and recovery of the material, if it is determined that the find cannot be avoided. The paleontologist shall make recommendations for necessary treatment that is consistent with currently accepted scientific practices. Any fossils collected from the area shall then be deposited in an accredited and permanent scientific institution where they would be properly curated and preserved.

Implementation of Mitigation Measure GEO-1 would reduce this potential impact to paleontological resources a less-than-significant level during construction because a plan to address discovery of unanticipated paleontological resources and to preserve and/or record those resources consistent with appropriate laws and requirements would be implemented. A less than significant impact with mitigation would occur.

3.8 Greenhouse Gas Emissions

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

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? (Less than Significant Impact)

NCUAQMD has not adopted regulations regarding the evaluation of greenhouse gas (GHG) emissions in a CEQA document and has not established CEQA significance criteria to determine the significance of impacts with regard to GHGs. The NCUAQMD has stated that they would not comment adversely on the use of thresholds of significance from the Bay Area Air Quality Management District (BAAQMD) for projects within Humboldt County. However, the BAAQMD has recently revised their adopted recommended CEQA thresholds of significance for GHG. The BAAQMD's Justification Report for the newly adopted GHG thresholds identify the thresholds as specific for 'development projects' of commercial/residential development and other projects. Per the Draft Justification Report:

> The Air District has developed these thresholds of significance based on **typical residential and commercial land use projects** and typical long-term communitywide planning documents such as general plans and similar long-range development plans. As such, these thresholds may not be appropriate for other types of projects that do not fit into the mold of a typical residential or commercial project or general plan update.
>
> Lead agencies should keep this point in mind when evaluating other types of projects. A lead agency does not necessarily need to use a threshold of significance if the analysis and justifications that were used to develop the threshold do not reflect the particular circumstances of the project under review. Accordingly, **a lead agency should not use these thresholds if it is faced with a unique or unusual project for which the analyses supporting the thresholds as described in this report do not squarely apply**. In such cases, the lead agency should develop an alternative approach that would be more appropriate for the particular project before it, considering all of the facts and circumstances of the project on a case-by-case basis. (emphasis added)

Additionally, the BAAQMD's Justification Report states:

> There is no proposed construction-related climate impact threshold at this time. Greenhouse gas emissions from construction represent a very small portion of a project's lifetime GHG emissions. The proposed thresholds for land use projects are designed to address operational GHG emissions which represent the vast majority of project GHG emissions. (BAAQMD 2022)

Therefore, as the BAAQMD and NCUAQMD do not have recommended thresholds of significance to apply to construction-period emissions or infrastructure projects, the Sacramento Metropolitan Air Quality Management District's (SMAQMD) and South Coast Air Quality Management District's (SCAQMD) recommended GHG methodology and thresholds for construction impacts were applied to this analysis. For project construction, SMAQMD has a threshold of 1,100 metric tons of carbon dioxide ($MTCO_2e$) per year threshold of significance (SMAQMD 2021). SCAQMD recommends that construction emissions be amortized over the life of the project, defined as 30 years, and added to the operational emissions for comparison against the threshold of significance.

Therefore, in order to assess the potential impact of construction-generated emissions, the construction GHG emissions are annualized over an assumed 30-year project lifespan, added to operational emissions, and compared against a threshold of 1,100 $MTCO_2e$.

Project construction activities would result in exhaust emissions from on-road trucks, worker commute vehicles, and off-road heavy-duty equipment. Construction emissions were estimated using CalEEMod version 2020.4.0 and were estimated to be approximately 241.92 $MTCO_2e$ from all construction activities, or 8.06 $MTCO_2e$ per year when annualized over the assumed 30-year lifespan of the Project. The CalEEMod assumed an estimated 2,520 cubic yards of off haul spanning a 282-mile trip length from the Project site to the Vacaville Recology Center. The Project is not capacity enhancing and would not likely result in more vehicle trips. Required maintenance of the Project would be incorporated into the existing maintenance and operations schedule and would be similar to what maintenance requirements currently exist. Therefore, the Project's would not generate an increase in operation-related emissions.

Project emissions of 8.06 $MTCO_2e$ per year (annualized construction) would be less than the 1,100 $MTCO_2e$ threshold. Therefore, the Project's impact would be less than significant.

b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases? (No Impact)

The California Air Resource Board (CARB) 2017 Climate Change Scoping Plan provides California's climate policy portfolio and recommended strategies to put the State on a pathway to achieve the 2030 target. The scenario includes ongoing and statutorily required programs, continuing the Cap-and-Trade Program, and high-level objectives and goals to reduce GHGs across multiple economic sectors. Existing programs, also known as "known commitments," identified by the 2017 Climate Change Scoping Plan include: SB 350, the Low Carbon Fuel Standard, CARB's Mobile Source Strategy, SB 1383 for short-lived climate pollutants and California's Sustainable Freight Action Plan. The high-level objective and goals recommendations cover the energy, transportation, industry, water, waste management, agriculture, and natural and working lands, and are to be implemented by a variety of State agencies.

Project construction would cause a temporary increase in GHGs, however as discussed above Project emissions would not exceed the identified emission thresholds. Project construction is analyzed for consistency with the *2017 Climate Change Scoping Plan* in Table 3.8-1.

Table 3.8-1. Consistency Analysis Between Project and Climate Change Scoping Plan

Scoping Plan Reduction Measures	Consistency/Applicability Determination
California Cap-and-Trade Program Linked to Western Climate Initiative. Implement a broad-based California Cap-and-Trade program to provide a firm limit on emissions. Link the California cap-and-trade program with other Western Climate Initiative Partner programs to create a regional market system to achieve greater environmental and economic benefits for California. Ensure California's program meets all applicable AB 32 requirements for market-based mechanisms.	**Not Applicable**. This is a statewide measure that cannot be implemented by the Project or lead agency.
California Light-Duty Vehicle Greenhouse Gas Standards. Implement adopted standards and planned second phase of the program. Align zero-emission vehicle, alternative and renewable fuel and vehicle technology programs with long-term climate change goals.	**Consistent**. This is a statewide measure that cannot be implemented by the Project or lead agency. However, the standards would be applicable to the light-duty vehicles that would access the Project Area during construction.
Energy Efficiency. Maximize energy efficiency building and appliance standards; pursue additional efficiency including new technologies, policy, and implementation mechanisms. Pursue comparable investment in energy efficiency from all retail providers of electricity in California.	**Not Applicable**. This is a measure for the state to increase its energy efficiency standards in new buildings. The Project would not result in new habitable buildings subject to the energy efficiency standards.

Scoping Plan Reduction Measures	Consistency/Applicability Determination
Renewable Portfolio Standard. Achieve 33 percent renewable energy mix statewide. Renewable energy sources include (but are not limited to) wind, solar, geothermal, small hydroelectric, biomass, anaerobic digestion, and landfill gas.	**Not Applicable**. This is a statewide measure that cannot be implemented by the Project or lead agency.
Low Carbon Fuel Standard. Develop and adopt the Low Carbon Fuel Standard.	**Consistent**. This is a statewide measure that cannot be implemented by the Project or lead agency. The standard would be applicable to the fuel used by vehicles that would access the Project Area during construction.
Regional Transportation-Related Greenhouse Gas Targets. Develop regional greenhouse gas emissions reduction targets for passenger vehicles. This measure refers to SB 375.	**Not Applicable.** This is a statewide measure calling for the development of GHG emission reduction targets.
Vehicle Efficiency Measures. Implement light-duty vehicle efficiency measures.	**Not Applicable.** This is a statewide measure that cannot be implemented by the Project or lead agency.
Goods Movement. Implement adopted regulations for the use of shore power for ships at berth. Improve efficiency in goods movement activities.	**Not Applicable.** The Project does not propose any changes to modes of transportation of goods.
Million Solar Roofs Program. Install 3,000 MW of solar-electric capacity under California's existing solar programs.	**Not Applicable.** The Project does not involve structures with roofs.
Medium/Heavy-Duty Vehicles. Adopt medium and heavy-duty vehicle efficiency measures.	**Not Applicable.** This is a statewide measure that cannot be implemented by the Project or lead agency.
Industrial Emissions. Require assessment of large industrial sources to determine whether individual sources within a facility can cost- effectively reduce greenhouse gas emissions and provide other pollution reduction co-benefits. Reduce greenhouse gas emissions from fugitive emissions from oil and gas extraction and gas transmission. Adopt and implement regulations to control fugitive methane emissions and reduce flaring at refineries.	**Not Applicable.** This measure would apply to the direct GHG emissions at major industrial facilities. The Project is not industrial.
High Speed Rail. Support implementation of a high-speed rail system.	**Not Applicable**. This is a statewide measure that cannot be implemented by the Project or lead agency. The Project does not involve a high-speed rail system.
Green Building Strategy. Expand the use of green building practices to reduce the carbon footprint of California's new and existing inventory of buildings.	**Not Applicable**. This is a measure for the state to increase its energy efficiency standards in new buildings. The Project would not result in new habitable buildings subject to the energy efficiency standards.
High Global Warming Potential Gases. Adopt measures to reduce high global warming potential gases.	**Not Applicable**. The Project would not include air conditioners or commercial refrigerators.
Recycling and Waste. Reduce methane emissions at landfills. Increase waste diversion, composting, and commercial recycling. Move toward zero-waste.	**Consistent.** The Project does not include a landfill. The Project would reduce construction waste with implementation of state mandated recycling and reuse mandates.
Sustainable Forests. Preserve forest sequestration and encourage the use of forest biomass for sustainable energy generation.	**Not Applicable**. Although the Project is located in a rural setting, it would not adversely affect forestland. Additionally, the Project would not include areas suitable for reforestation. The Project would replant most native trees removed during construction.
Water. Continue efficiency programs and use cleaner energy sources to move and treat water.	**Not Applicable**. The Project would not include an increase in water consumption or energy use associated with water treatment or transport.
Agriculture. In the near-term, encourage investment in manure digesters and at the five- year Scoping Plan update determine if the program should be made mandatory by 2020.	**Not Applicable.** The Project does not include agricultural production.

Source of Scoping Plan Reduction Measures: CARB 2008

As described in the table above, no conflicts with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHG have been identified. Therefore, no impact would result.

3.9 Hazards and Hazardous Materials

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

Where hazardous materials and associated contamination are present, they can pose a potential exposure risk to humans and the environment, if appropriate measures are not taken to contain and minimize such hazards. To evaluate the Project Area with respect to the presence and location of existing and/or historical soil and groundwater contamination, a Hazardous Materials Corridor Study, including regulatory database review, was completed by SHN in August 2021. The database review identified sites that government regulatory agencies have reported as having environmental concerns, such as releases of contaminants to the soil and/or groundwater, underground storage tanks (USTs) or use of hazardous materials (SHN 2021). Subsequently, SHN completed a Phase II Environmental Site Assessment (ESA) in May 2022 (SHN 2022b). As described in Impact (d), the Phase II ESA identified contaminated soil and groundwater within the Project Area and recommended handling, sampling, testing, and disposal procedures (SHN 2022b).

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? (Less than Significant Impact)

Construction of the Project would include the transport and use of common hazardous materials inherent to the construction process, including petroleum products such as fuel and lubricants for construction equipment and vehicles, paints, concrete curing compounds, and solvents for construction of Project improvements. These materials are commonly used during construction, are not acutely hazardous, and would be used in relatively small quantities.

Hazardous materials storage, handling, and transportation must comply with an interconnected matrix of local, state, and federal laws. Hazardous materials used during construction of the Project would be subject to applicable regulations, including California Health and Safety Code Section 25531, Division 20, Chapter 6.5 and other standards enforced by the various departments and boards under the California Environmental Protection Agency (Cal/EPA). The Project would be subject to Cal/EPA hazardous materials regulations consolidated under the state's Unified Program enforced by the Department of Toxic Substances Control (DTSC), the State Water Resources Control Board (SWRCB), NCRWQCB, NCUAQMD, and the Department of Resources Recycling and Recovery (CalRecycle). The Cal/EPA administers the Unified Program via local Certified Unified Program Agencies (CUPAs). The CUPA for Humboldt County is the Humboldt County Division of Environmental Health (HCDEH). The HCDEH Hazardous Materials Unit has jurisdiction over the Project Area and is tasked with local CUPA inspections and compliance. Project activities involving the transport, use, storage, and disposal of hazardous materials will be in accordance with established rules and regulations.

Worker exposure to hazardous materials is regulated by California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA) and requires worker safety protections. Cal/OSHA enforces hazard communication regulations which require worker training and hazard information (signage/postings) compliance. In addition, hazard communication compliance includes procedures for identifying and labeling hazardous substances, communicating information related to hazardous substances storage, handling, and transportation; and preparation of health and safety plans to protect employees.

Project construction specifications will require the management of hazardous materials to comply with applicable laws, rules, and regulations. During Project construction, the contractor would be required to contain hazardous materials and avoid exposure to workers, the public, and surrounding environment during construction. An appropriate facility would be utilized for legal disposal of any hazardous materials generated, anticipated to be a Recology facility in either Vacaville or Wheatland, CA (SHN 2022b).

Project construction would be required to implement storm water management requirements during construction in accordance with the SWRCB General Construction Storm Water Permit (Section 1.12.1 – Environmental Protection Action 1). Stormwater management requirements for addressing materials management would be required, including proper material delivery and storage, spill prevention and control, and management of concrete and other wastes, as described in Section 3.10 (Hydrology and Water Quality).

The established regulatory framework, BMPs, and requisite construction protocols provide appropriate risk mitigation and hazard protections, thus the Project would not create a significant hazard to the public or environment from hazardous materials. Because the City and its contractors would be required to comply with existing and future hazardous materials laws and regulations addressing the transport, storage, use, and disposal of hazardous materials, the potential to create a significant hazard to the public or the environment during Project construction would be less than significant.

Following construction, operation of the Project would require intermittent maintenance and repair, which could involve hazardous materials such as fuel in vehicles or other equipment. The operational risk posed by intermittent maintenance and repair of the storm water system specific to hazardous materials is low. The potential to create a significant hazard to the public or the environment during Project operation would be less than significant.

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment? (Less than Significant Impact with Mitigation)

The 2021 Hazardous Materials Corridor Study, which included review of the Cal/EPA Cortese List, including the SWRCB GeoTracker and DTSC EnviroStor databases, identified existing (active) and historical (inactive) sites in proximity to the Project Area associated with contaminants present in soil and/or groundwater (SHN 2021). Given the proximity of these potentially contaminated sites, the Project construction has the potential to disturb remnant contaminants in soil and/or groundwater. Contaminated soil, groundwater, and/or hazardous materials would require special handling and disposal during Project construction. These contaminants could result in a potentially significant impact.

Soil and/or groundwater contamination present within the Project Area was identified during Phase II ESA sampling conducted in March 2022 (SHN 2022b). Based on the location and extent of excavation, workers may potentially be exposed to hazardous materials during construction activities that impact soil, create dust, and/or encounter groundwater, such as excavation, earthmoving, or infrastructure removal/replacement.

To account for the potential presence of contaminants in soil and groundwater a Soil Excavation, Stockpiling and Transportation Plan (SESTP) would be prepared to direct soil and groundwater handling, and disposal for specific contaminants of concern (COCs) within the Project Area as described in Mitigation Measure HAZ-1. To characterize structures within the Project Area for the presence of asbestos, an assessment survey would be conducted of building materials within the Project scope prior to commencement of construction as noted in Mitigation Measure HAZ-2.

To address potential exposure to contaminated soil and/or groundwater, Mitigation Measure HAZ-1 would be implemented. Mitigation Measure HAZ-1 requires that the City prepare and implement a SESTP outlining the contamination hazard mitigation means and methods to be employed during Project construction. Implementation of Mitigation Measure HAZ-1 would establish appropriate protections, including material handling, storage, disposal, dust control measures, for workers and the environment with respect to contaminated soil and/or groundwater exposure. Given the requirements of Mitigation Measure HAZ-1 and the BMPs required for soil management onsite, the potential hazard associated with the disturbance of contaminated soil and/or groundwater would be less than significant with mitigation incorporated.

The Project would utilize heavy machinery to perform construction-related tasks including grading, excavation, and transportation of materials. During any construction project involving operation of equipment, there is the possibility for an accident to occur, and fuel to be released onto the soil. A potentially significant impact could result from an accidental spill, especially in proximity to a wetland or waterway. This potential impact is addressed under Mitigation Measure BIO-4 (see Section 3.4 – Biological Resources). Mitigation Measure BIO-4 includes requirements to avoid refueling and equipment maintenance near streams and wetlands. Under Mitigation Measure BIO-4, equipment shall not be refueled within 100 feet of wetlands or waterways as well as other requirements (such as the requirement to have spill kits on site) as described in Mitigation Measure BIO-4 to protect the environment from the accidental release of hazardous materials. With the incorporation of Mitigation Measure BIO-4, any potential impact related to streams and wetlands from an accidental spill would be less than significant.

Improvements to the roadway surface, storm drains, and other roadway infrastructure would be necessary to complete the Project. Improvements to these constructed features would include impaction of road surface, curbs, storm drains, and other storm water infrastructure. Materials associated with these components could potentially contain asbestos. As included in Mitigation Measure HAZ-2, to mitigate the potential for airborne asbestos fiber release during Project construction, a survey would be conducted prior to renovation and/or demolition work to identify and sample suspect Asbestos Containing Materials in compliance with the USEPA National Emissions Standards for Hazardous Air Pollutants (NESHAP) regulations, per Title 40 CFR Section 61, Subparts A and M. Prior to the commencement of Project construction, the NESHAP survey would be submitted to the NCUAQMD, the local USEPA delegated authority with responsibility for administering the NESHAP rules within the Project Area. Based on the findings of the NESHAP survey, potential Asbestos Containing Materials (ACM) identified within the Project Area would be properly removed in accordance with Cal/OSHA regulations prior to other Project construction. With adherence to the NESHAP requirements enforced by the NCUAQMD and worker protection rules enforced by Cal/OSHA, the potential hazard associated with the disturbance of asbestos would be less than significant.

To account for the potential disturbance of asbestos in building materials during Project construction, Mitigation Measure HAZ-2 would require assessment of the structures within the Project Area in compliance with USEPA NESHAP regulations. If asbestos is identified within the Project construction scope of work, then such materials shall be removed by a licensed abatement contractor prior to other Project construction work. Given the requirements of Mitigation Measure HAZ-2, the potential hazard associated with the disturbance of asbestos would be less than significant with mitigation incorporated.

Mitigation

Mitigation Measure HAZ-1 would reduce the impact of potential exposure to hazardous materials to construction workers, and nearby receptors by preparing a site-specific soil and groundwater plan and implementing the recommendations of the Phase II ESA (SHN 2022b). Mitigation Measure HAZ-2 would reduce the potential impact of airborne asbestos fiber exposure by conducting a pre-construction survey and properly removing identified asbestos materials. Mitigation Measures HAZ-1 and HAZ-2 would require the proper handling, transportation, and disposal of hazardous wastes per applicable local, state, and federal regulations.

Mitigation Measure HAZ-1: Prepare Soil Plan, Implement Phase II ESA Recommendations

The City shall complete the following requirements to appropriately stockpile, handle, test, and dispose of contaminated soil and groundwater within 200 feet of the Environmental Sample Locations as shown on Figure 3 of the Phase II ESA prior to Project construction:

- A Soil Excavation, Stockpiling and Transportation Plan (SESTP) shall be prepared prior to waste stream generation. The SESTP shall specify measures to properly handle, store, transport, and dispose of contaminated soil and groundwater.
- The SESTP shall address soil and groundwater, stockpiling/storage, waste characterization, and disposal. The SESTP will specify measures to appropriately manage soil and groundwater spills during Project construction, worker protection, fugitive dust/emissions control, and waste characterization.
- The SESTP shall also address worker health and safety during Project construction, including the specific level of protection required for construction workers. This shall include preparation of a site-specific health and safety plan for Project construction prepared in accordance with Cal/OSHA regulations (8CCR5192).
- Soil spoils generated by the Project construction shall be placed on a non-porous disposable groundcover (polyethylene sheeting or similar) and covered. Groundwater shall be containerized in drums, poly tanks or Baker tanks.
- Waste streams shall be appropriately containerized and characterized prior to transport off-site. An appropriately licensed waste transporter shall be utilized to haul waste to the disposal facility permitted to accept the type of waste generated.

Mitigation Measure HAZ-2: Characterize Existing Suspect Asbestos Building Materials Within Project Area

The City shall complete the following requirements to appropriately characterize suspect Asbestos Containing Materials (ACM) within the Project Area prior to Project construction:

- Where Project construction design proposes to include demolition or deconstruction of existing structures (including roadways), pre-construction sampling of suspect ACM shall be conducted associated with such structures in accordance with USEPA National Emissions Standards for Hazardous Air Pollutants (NESHAP) regulations.
- Where ACM is identified on or within structures that may be impacted by Project construction, such material shall be appropriately removed by a certified abatement contractor prior to other construction work impacting the structure(s) where the ACM occurs. Asbestos waste generated during abatement shall be packaged in leak-tight containers and transported by a licensed waste hauler to a disposal facility licensed to accept such waste.

The implementation of Mitigation Measure HAZ-1 and HAZ-2 would reduce the impact of potential exposure from potential hazardous materials to construction workers, nearby receptors, and the environment to a less-than-significant level.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? (Less than Significant Impact)

The Project Area consists of public roadways, bordered by mixed-use industrial facilities, residential, and commercial uses (Figure 2 – Project Boundary Map). As listed in Table 3.9-1, there are two schools located within 0.25 mile the Project Area (St. Barnard's Academy and Pacific View Charter School). Table 3.9-1 also lists schools located in the general vicinity of the Project Area (located more than 0.25 mile from the Project).

Table 3.9-1. Schools Located in Proximity to the Project Area.

Name	Address	Proximity
Redwood Christian School	2039 E St, Eureka, CA 95501	Approximately 0.27-miles northeast of Williams Street Region Area
St. Bernard's Academy	222 Dollison St, Eureka, CA 95501	Approximately 0.11-miles south of Williams Street Region Area
Eureka High School	1915 J St, Eureka, CA 95501	Approximately 0.55-miles northeast of Williams Street Region Area
Pacific View Charter School	115 Henderson St, Eureka, CA 95501	Approximately 0.21-miles southwest of Williams Street Region Area
Zoe Barnum High School	216 W Harris St, Eureka, CA 95501	Approximately 0.42-miles southwest of Williams Street Region Area
Trinity Lutheran School	2826 L St, Eureka, CA 95501	Approximately 0.42-miles southeast of Williams Street Region Area
Alder Grove Charter School	714 F St, Eureka, CA 95501	Approximately 0.50-miles southeast of Commercial Street Region Area

The Project includes the use of heavy machinery, which would emit emissions such as carbon monoxide and are assumed to include the use of hazardous materials such as fuels, lubricants, and degreasers. Project construction would also use potentially hazardous products such as paints and solvents. These materials are commonly used during construction, are not acutely hazardous, and would be used in small quantities. The air emissions related to Project are addressed in Section 3.3 (Air Quality).

As discussed in Impact (b) above, the City and its contractors would be required to comply with existing and future hazardous materials laws and regulations governing the use, transport, and disposal of hazardous materials. Although construction activities could result in the inadvertent release of small quantities of hazardous construction chemicals, a spill or release at a construction area is not expected to endanger individuals at nearby schools given the nature of the materials and the small quantities that would be used.

As the City and its contractors would be required to comply with existing and future hazardous materials laws and regulations covering the transport, use, and disposal of hazardous materials, and because of the nature and quantity of the hazardous materials potentially used by the Project, the impact related to the use of hazardous materials during construction in proximity to school sites would be less than significant.

Project operation would not include a new stationary source of hazardous emissions or handling of acutely hazardous materials or waste; thus, no impact would result from Project operations.

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment? (Less than Significant Impact with Mitigation)

The Project Area is located on and near sites included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 (SHN 2021). As part of the Hazardous Materials Corridor Study, governmental records were consulted from the Cal/EPA Cortese List, including the SWRCB GeoTracker, and DTSC EnviroStor databases. Hazardous materials sites within and near the Project Area are identified in Table 4 of the Hazardous Materials Corridor Study (SHN 2021). Potential Project impacts to contaminated sites are identified on Figure 13 of the

Hazardous Materials Corridor Study (SHN 2021). Soil and groundwater within the Project Area are known to be contaminated as described in the Phase II ESA (SHN 2022b).

Mitigation Measure HAZ-1 includes soil and groundwater contamination hazard management strategies and Mitigation Measure HAZ-2 includes hazard materials sampling to ensure the potential impact from known hazardous sites and contamination would be reduced to a less-than-significant level.

The Project is located along an urbanized industrial and commercial area, which is known to include past use of heavy metals and other constituents associated with historical industrial and commercial activity and construction. Groundwater dewatering is expected. Groundwater encountered during construction would be from shallow groundwater and not associated with a deeper aquifer. Therefore, Project construction activities may encounter residual concentrations of hydrocarbons, creosote wood products, and other hazardous materials in the soil or groundwater. The impact is considered significant. With implementation of Mitigation Measure HAZ-1, this potential impact would be reduced to a less-than-significant level.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area? (No Impact)

The Project Area (Williams Street) is located approximately 3.0 miles southwest of the Murray Field Airport (EKA). The Project Area (Railroad Street and staging area) is located approximately 1.3 miles west of Samoa Field Airport (O33). The Project is situated approximately 12 miles south of Humboldt County's primary airport, the California Redwood Coast – Humboldt County Airport (ACV).

The ACV, EKA, and O33 are covered by the 2021 Airport Land Use Compatibility Plan (ALUCP) prepared for the Humboldt County Airport Land Use Commission (ALUC) by ESA (ESA 2021). The ALUCP defines Airport Influence Areas (AIA) around airport facilities, dividing AIAs into two Review Areas (1 and 2). The Project Area is not located within the AIA Review Area 1, established around ACV, EKA, or O33, and is not located within the AIA Review Area 2 around ACV or EKA (ESA 2021). The Project's westernmost phases are within the AIA Review Area 2 established around O33. The AIA Review Area 2 denotes the area around O33 where airspace protection and overflight notification policies apply.

Project infrastructure would be limited to several feet above ground level and would not include construction of structures which would approach any protected airspace or otherwise impact the air traffic operations of O33. The Project would not include a residential or commercial ownership transfer; thus, overflight notifications would not apply to the Project. Therefore, the Project would not include any elements that would interfere with the airspace protection and overflight notification policies, or otherwise conflict with the Review Area 2 constraints.

As the Project would not result in a safety hazard or excessive noise and would not conflict with the requirements of the O33 AIA Review Area 2, no impact would result.

f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? (Less than Significant Impact)

The Project Area is subject to the Humboldt County Emergency Operations Plan (EOP). The County's EOP identifies the emergency response and evacuation policies and procedures for hazards related to earthquake, tsunami, extreme weather, flooding/flash flooding, landslides, transportation accidents, hazardous materials, interface wildlife fire, energy shortage, offshore toxic spill, civic disturbance, terrorist activities, and national security (Humboldt County 2015).

The Humboldt County EOP establishes a structure for Humboldt County Operation Area agencies to respond to large-scale emergencies requiring multiagency participation or activation of the Humboldt County Emergency Operations Center (EOC) (Humboldt County 2015). Hazard mitigation and risk assessment strategies for Humboldt County Operation Area are formalized in the Humboldt County Operational Area Hazard Mitigation Plan (HMP). The Humboldt County EOP and HMP have not designated specific evacuation routes or emergency shelter locations or included policies or procedures with which the Project would conflict. Therefore, the Project would not impair implementation of or physically interfere with the Humboldt County EOP or HMP.

Temporary lane closure to various public access roadways and pathways would be required during Project construction at the roadway crossings described in Section 1.10.2 (Traffic and Access Control). Lane closures would safely demarcate and separate Project construction work along public roadways.

Lane closures would be in effect for a discrete portion of the overall Project construction and would not be required during Project construction at other locations within the Project Area. Signage, notifications, and timing for lane closure, as applicable, would be established in accordance with City of Eureka and Caltrans requirements. Emergency response vehicle access to locations in proximity to the Project Area would not be impeded because of lane closures.

Once constructed, operational use of the Project would not modify transportation along public roadways. Thus, emergency response or evacuation via existing roadways would not change compared to existing conditions. As the Project would not impair implementation of an emergency response plan or evacuation plan, the potential impact related to the temporary lane closures during Project construction would be less than significant.

g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires? (Less than Significant Impact)

Wildland fire is addressed in Section 3.20 (Wildfire). As noted in Section 3.20, the Project would not expose people or structures to a significant risk from wildland fires, thus a less than significant impact would result. Please see Section 3.20 for further discussion of the Project as it relates to wildland fire risks.

3.10 Hydrology and Water Quality

	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?		X		
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?				X
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
i. Result in substantial erosion or siltation on- or off-site?			X	
ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?				X
iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?				X
iv. Impede or redirect flood flows?			X	
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?				X
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?				X

Waters of the U.S. within the Project Area include the open Humboldt Bay tidal channel west of Palco Marsh, Clark Slough, and two- and three-parameter wetlands; see Appendix F (within Appendix C) for the Aquatic Resources Delineation Report (GHD 2022b). These waters and wetlands are regulated as Waters of the U.S. and state and are under the jurisdiction of the USACE, NCRWQCB. The western extent of the Project Area is located within the Coastal Zone and spans two jurisdictional boundaries: Palco Marsh is located within the state jurisdiction and is therefore regulated by the California Coastal Commission; and all other portions of the Project within the Coastal Zone are under local jurisdiction and are therefore regulated by the City of Eureka. Palco Marsh is a tidally influenced waterway (by Humboldt Bay) with two high and low tide events daily. Tidal influence of Clark Slough in the vicinity of Waterfront Drive is limited by a tide gate located approximately 0.25 miles downstream. A portion of the Project is within the FEMA 100-year flood zone, see Figure 3, in Appendix A (FEMA 2022).

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality? (Less than Significant Impact with Mitigation)

The Project is required to obtain and comply with necessary Clean Water Act permit requirements from the NCRWQCB and the USACE, which would prevent, or essentially reduce the potential for Project construction and operation to violate water quality standards or waste discharge requirements.

The greatest potential Project impacts to water quality would result from sediment mobilization during construction, including enhancements to Palco Marsh and construction of the outfall and tide gates between Palco Marsh and

Humboldt Bay. Construction activities such as site clearing, grading, excavation, and material stockpiling could leave soils exposed to rain or surface water runoff that may carry soil contaminants (e.g., nutrients or other pollutants) into waterways adjacent to the site, degrade water quality, and potentially violate water quality standards for specific chemicals, dissolved oxygen, suspended sediment, or nutrients. Therefore, if not properly managed, construction activities could result in erosion, as well as the discharge of chemicals and materials into receiving waters. In such an instance, applicable water quality standards and waste discharge requirements could be violated, and polluted runoff could substantially degrade water quality in the local storm drain system.

However, as described in Section 1.12 (Environmental Protection Action 1), because the proposed Project is anticipated to disturb over one acre of land, compliance with State Water Board Order No. 2009-0009 would be required which would regulate storm water runoff from Project construction activities via a SWPPP. The SWPPP would identify and specify the use of erosion sediment control requirements for control of pollutants in storm water runoff during construction related activities, and would be designed to address erosion control, sediment control, off-site tracking control, wind erosion control, non-storm water management control, and waste management and materials pollution control. A Qualified SWPPP Practitioner would oversee implementation of the Plan during all elements of Project implementation, including visual inspections, sampling and analysis, and ensuring overall compliance.

As part of MS4 permitting, the Project provides water quality benefits consisting of rain gardens in select locations to provide filtration and/or treatment of runoff; trash capture devices to remove particles that are 5 mm or greater before discharging to Humboldt Bay and Palco Marsh; and improved access upstream of outfalls to conduct water quality monitoring and assessment.

The implementation of the new stormdrain pipe along Del Norte Street will increase the contributing runoff area to Palco Marsh from 396 acres to 685 acres and reduces the runoff to the other locations that discharge directly to Humboldt Bay (14th Street, Koster/Washington Street, and Commercial Street) (Table 3.10-1). Runoff associated with the 85th percentile storm event and changes to contributing drainage areas are shown in Table 3.10-2. The stormwater systems discharging at 14th Street, Koster/Washington Street, and Commercial Street are interconnected, resulting in mixing of varying proportions depending on several factors including tidal water levels and storm event intensity. The additional 289 acres of runoff contributions include residential (255 acres), commercial (30 acres) and open space (4.5 acres). In total, approximately 27% (289 acres or 15.7 acre-ft) of the total watershed (1,076 acres or 58.3 acre-ft) will be conveyed to Palco Marsh instead of directly to Humboldt Bay via three discharge locations.

Table 3.10-1 Changes in contributing runoff area based on land use to Palco Marsh and directly to Humboldt Bay

Land Use	Existing (acres)	Proposed (acres)	Change (acres)
Direct Runoff Area to Palco Marsh then Humboldt Bay			
Commercial	119.5	149.5	30.0
Industrial	47.9	47.9	0.0
Open Space	33.8	38.3	4.5
Residential	194.4	449.5	255.1
Total	**395.7**	**685.3**	**289.6**
Direct Runoff Area to Humboldt Bay (14th Street, Koster/Washington Street, and Commercial Street)			
Commercial	203.9	173.9	-30.0
Industrial	132.1	132.1	0.0
Open Space	4.5	0.0	-4.5
Residential	339.4	84.3	-255.1
Total	**679.9**	**390.3**	**-289.6**

Table 3.10-2 Changes in runoff from 85th percentile storm based on land use to Palco Marsh and directly to Humboldt Bay

Land Use	Existing (acre-ft)	Proposed (acre-ft)	Change (acre-ft)
Direct Runoff Area to Palco Marsh then Humboldt Bay			
Commercial	6.5	8.1	1.6
Industrial	2.6	2.6	0.0
Open Space	1.8	2.1	0.2
Residential	10.5	24.3	13.8
Total	**21.4**	**37.1**	**15.7**
Direct Runoff Area to Humboldt Bay (14th Street, Koster/Washington Street, and Commercial Street)			
Commercial	11.0	9.4	-1.6
Industrial	7.2	7.2	0.0
Open Space	0.2	0.0	-0.2
Residential	18.4	4.6	-13.8
Total	**36.8**	**21.1**	**-15.7**

Site-specific stormwater monitoring data (flow and contaminants) is not available within the contributing runoff area. To evaluate changes in the pollutant loading to Palco Marsh and Humboldt Bay, pollutant concentrations from the National Stormwater Quality Database are used and summarized in Table 3.10-3. Industrial land uses exhibit the highest copper and zinc concentrations but the lowest nitrate concentrations. Residential land uses exhibit the highest nitrate concentrations and lowest copper and zinc concentrations. Commercial land uses exhibit concentrations in between the two and open space is assumed to not contribute to these pollutants.

Table 3.10-3 Estimated pollutant concentrations based on land use[1]

Land Use	Total Copper (ug/L)	Total Zinc (ug/L)	Nitrate (mg/L)
Residential	12	73	0.94
Commercial	17	150	0.62
Industrial	22	210	0.48
Open Space	0	0	0

Assuming full mixing of stormwater runoff volumes resulting from the 85th percentile storm and land uses described in Table 3.10-1, Table 3.10-2, and Table 3.10-3, the changes to pollutant concentrations for existing and proposed conditions are presented in Table 3.10-4 (below). The increase in residential runoff contributions to Palco Marsh result in increased dilution thereby reducing copper and zinc concentrations of 0.15 ug/L and 7.88 ug/L, respectively. Nitrate increases by 0.10 mg/L. The inverse relationship is exhibited for the other discharge locations directly to Humboldt Bay, with an increase in copper and zinc, 2.25 ug/L and 31.45 ug/L, respectively, and decrease in nitrate of 0.11 mg/L. As stated above, these concentrations only represent the stormwater when mixing with tide water that would occur in both Palco Marsh and Humboldt Bay, which would dilute the stormwater and result in reduced concentrations of all pollutants. Additionally, under proposed conditions, the excavated channel would increase the tidal volume available for mixing at any given water level within the marsh, resulting in additional dilution.

[1] Pitt, R., A. Maestre and R. Morquecho. 2004. The National Stormwater Quality Database (NSQD, version 1.1). Paper presented at the World Water and Environmental Resources Congress, Salt Lake City, UT. http://rpitt.eng.ua.edu/Research/ms4/Paper/Mainms4paper.html; see also the National Stormwater Quality Database at http://www.bmpdatabase.org/nsqd.html.

Table 3.10-4 Changes in runoff pollutant concentrations in Palco Marsh and directly to Humboldt Bay with the proposed project

Pollutant	Existing Concentration	Proposed Concentration	Change
Direct to Palco Marsh then Humboldt Bay			
Total Copper (ug/L)	12.72	12.57	-0.15
Total Zinc (ug/L)	100.07	92.19	-7.88
Nitrate (mg/L)	0.64	0.74	0.10
Direct to Humboldt Bay (14th Street, Koster/Washington Street, and Commercial Street)			
Total Copper (ug/L)	15.36	17.61	2.25
Total Zinc (ug/L)	122.22	153.67	31.45
Nitrate (mg/L)	0.75	0.64	-0.11

In both existing and proposed conditions, stormwater discharge passes through Palco Marsh to Humboldt Bay. Therefore the duration for which stormwater is detained within the marsh and pollutant concentration of stormwater are the primary influences on marsh water quality and vegetation uptake of pollutants, as opposed to the total volume of stormwater and total mass of pollutants. No changes to the pollutant load to Humboldt Bay occurs given there is no change to the total contributing watershed discharge to Humboldt Bay.

The duration of stormwater detention within the marsh is affected by the flow rate and duration of stormwater discharge into the marsh, the flow rate of discharge from the marsh to Humboldt Bay, and tidal water levels. Pollutant concentration within Palco Marsh is a result of the stormwater discharge volume and pollutant concentration described above and the volume and pollutant concentration of tidal water that has entered Palco Marsh from Humboldt Bay through the inverted siphon. In general, under both existing and proposed conditions, during an ebb (outgoing) tide, stormwater may continually discharge from Palco marsh to Humboldt Bay. During flood tide, stormwater will be prevented from flowing out of Palco Marsh due to the incoming tide and higher water level in Humboldt Bay compared to Palco Marsh. The 85th percentile storm event was modeled and evaluated for existing and proposed conditions in combination with two tidal scenarios on Humboldt Bay, as measured at the North Spit, CA - Station ID: 9418767: a high tide event reaching 7.7 feet (NAVD) (85th percentile higher high tide) then dropping to 1.9 feet (NAVD) and a static tidal water level of -0.34 feet (NAVD), representing Mean Lower Low Water (MLLW).

The high tide event results in both tidal waters and runoff entering Palco Marsh (Exhibit 3-6). Tidal flow from Humboldt Bay (North Spit) continually enters Palco Marsh so long as water levels in Humboldt Bay are greater than water levels in Palco Marsh. This hydraulic condition results in all stormwater discharges to Palco Marsh remaining in the marsh and mixing with tidal waters. The mixed water within Palco Marsh begins to discharge to Humboldt Bay on the ebb tide, once water levels in Palco Marsh are greater than water levels in Humboldt Bay. Under proposed conditions, the peak water level in Palco Marsh is greater than existing conditions, but water levels within the marsh drop at a faster rate, more similar to the flood tide water levels, and reach a lower water level, discharging nearly all stormwater and tidal waters within one tidal cycle before the flood tide prevents discharge to Humboldt Bay and begins to fill Palco Marsh again. Although existing conditions exhibits less stormwater entering Palco Marsh, the discharge capacity of this stormwater is limited and does not fully drain before the flood tide prevents further drainage and stormwater and tide water begin filling Palco Marsh. Although proposed conditions result in a larger volume of stormwater entering Palco Marsh, this stormwater is held in the marsh for a shorter duration and the basin drains more effectively.

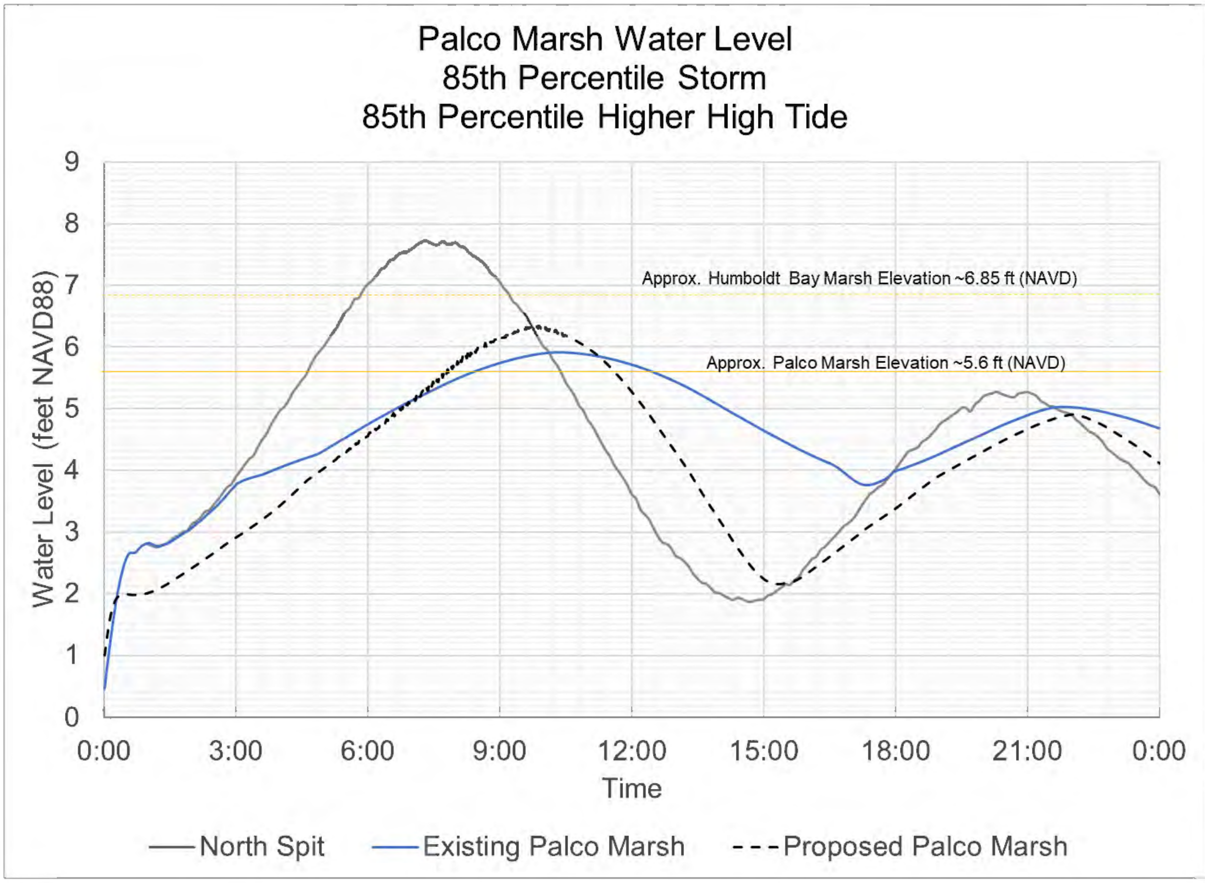

Exhibit 3-6 The increased stormwater discharge capacity from Palco Marsh to Humboldt Bay results in a reduced duration of stormwater detention within Palco Marsh and water levels with a more similar tidal signature to a natural system during a high tide event.

The static tidal elevation at MLLW results in stormwater being continually discharged from Palco Marsh to Humboldt Bay (Exhibit 3-7). Without the influence of tidal waters entering Palco Marsh, stormwater freely flows through Palco Marsh channel and is discharged through the crossing to Humboldt Bay. Water levels under proposed conditions are continually lower than those of existing conditions due to the new channel grading, deepening of the existing channels, and lowering of the crossing invert. Existing stormwater discharge results in water levels ranging from elevation 2.2 feet to 2.7 feet, while proposed water levels range from elevation 1.0 feet to 1.6 feet.

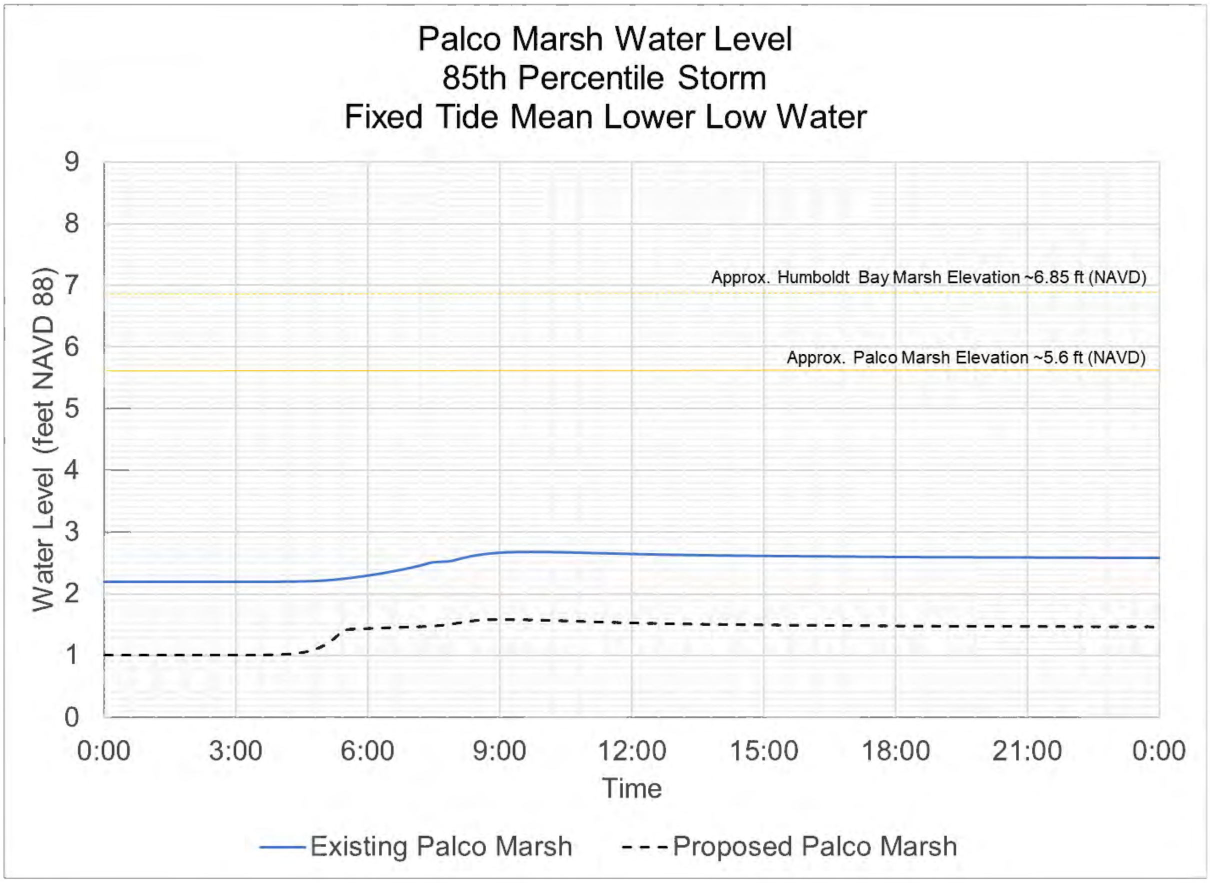

Exhibit 3-7 The increased stormwater discharge capacity from Palco Marsh to Humboldt Bay results in a reduced duration of stormwater detention with Palco Marsh and lower water levels when absent of tidal influence.

Under proposed conditions, a relatively small increase in nitrate and reduction in zinc and copper occurs, with nearly complete discharge of stormwater within a single tidal cycle from Palco Marsh. Existing conditions continue to store stormwater over multiple tidal cycles. Thus proposed conditions reduces the contact time of stormwater with the marsh. Therefore as described above, the proposed Project is not anticipated to diminish water quality and marsh habitat within Palco Marsh.

Additionally, implementation of Mitigation Measure BIO-4 would provide protections to aquatic species and habitat via implementation of BMPs to manage erosion and minimize potential sediment from entering waterways. Mitigation Measure BIO-4 also includes BMPs to be implemented during dewatering and species relocation. Water sourced from dewatering activities would be pumped into Baker tanks (or similar), settling basins, upland areas or the City's sewer system. The Project would have no adverse impact on groundwater quality because use of groundwater is not proposed.

With inclusion of Environmental Protection Action 1 and Mitigation Measure BIO-4, potential impacts to water quality would be reduced to a less-than-significant level. Following construction, operation and maintenance of the Project would not result in a new point discharge, a substantial increase in impervious surfaces, or require planned discharges to the local storm drain system. No operational impact would result.

b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin? (No Impact)

The Project is located in the Eureka Plain Groundwater Basin No. 1-9 and has a priority listing of "very low" by the Department of Water Resources (DWR 2020). Use of groundwater is not proposed during construction or operation of the Project, although some limited dewatering of "construction water" (which is groundwater that seeps into a construction area following initial dewatering) may occur. Dewatering of construction water would be small in scale and limited to shallow groundwater that re-enters the construction area following initial dewatering. Groundwater which seeps into the area in or from areas of known contamination would be containerized in drums, poly tanks or Baker tanks, as discussed in Section 3.9 – Hazards and Hazardous Materials. Construction of the Project would not decrease groundwater supplies or interfere with groundwater management, and there would not be a construction-related impact on groundwater supply.

Operation of the Project would benefit groundwater supply due to the installation of LID features which would capture stormwater to infiltrate and settle in proposed LID areas that would otherwise flow into the storm water system for discharge into Humboldt Bay. Implementation of the Project would result in a reduction in the amount of impervious surfaces. The Project would result in improved groundwater recharge compared to existing conditions. No Impact would occur.

c. i) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would result in substantial erosion or siltation on- or off-site? (Less than Significant Impact)

Minor modifications to drainage via the construction of a channel in the northwest corner of Palco Marsh would occur under the Project. The proposed channel would connect to an existing channel, and therefore the drainage pattern would not be substantially altered. Construction would occur when the area is dewatered, and erosion and sediment control measures would be implemented to minimize sediment from entering into Humboldt Bay (in accordance with the Project's SWPPP and Mitigation Measure BIO-4).

Within the developed portion of the Project, there would be no changes to surface drainage patterns except for at the LID features where drainage would settle as opposed to move offsite. Implementation of standard BMPs would minimize erosion or siltation from exiting the Project site. Larger diameter stormwater pipes would be installed under the Project, which would drain to Palco Marsh.

The Project increases the capacity of the City's stormdrain system to the 10-year storm event within the Project Area.

The proposed channel within Palco Marsh is based on observed indicators of historical channel size, including top width and typical channel bottom elevations and side slopes. Historical indicators and typical slough channel characteristics suggest a bottom width of 10 feet, 2H:1V side slopes and slope of 0.2%. With this geometry the 10-year storm event, without any tidal waters present, would exhibit a flow depth of 3.3 feet, velocity of 3.8 ft/sec and shear stress of 0.67 lbs/ft^2. Typical channel geometry exhibits a minimum depth of 3.5 feet.

While changes in the distribution of flows within the existing storm drain system would result in increases to flow volumes at some existing outlets and decreases to others, engineered energy dissipation along with bank protection would protect discharge of this water from significantly effecting erosion within Palco Marsh. Construction of the Project would yield a reduction in impervious surfaces. Operation of the Project would not cause an alteration of existing drainage patterns. Due to the reasons stated above, a less than significant impact would occur.

c. ii, iii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site or create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff? (No Impact)

The purpose of the Project is to reduce flooding via increased storm water capacity of conveyance piping, in conjunction with LID features, increased storage capacity within Palco Marsh, and tide gates. Additionally, no new impervious surfaces would be created as a result of the Project. The proposed TCDs would capture litter and other pollution within the runoff.

The Project increases the capacity of the City's stormdrain system to the 10-year storm event within the Project Area. Under the 10-yr storm event and 85^{th} percentile higher high tide in Palco Marsh, the proposed conditions result in more effective discharge of stormwater to Humboldt Bay, slightly higher water levels, and reduced duration of inundation (Exhibit 3-8). However, in the absence of tidal influence proposed conditions reduce the peak water level and more efficiently discharge stormwater from Palco Marsh (Exhibit 3-9). In both conditions, flood waters remain below the perimeter elevation of approximately 9 feet (NAVD88) resulting in no increased flooding on- or off-site. The existing structure between Palco Marsh and Humboldt Bay is limited in conveyance capacity and runoff to Palco Marsh is equal to the discharge through the crossing, resulting in sustained freshwater inundation of the marsh plain for multiple tidal cycles, while proposed conditions water levels reach marsh plain elevations within two tidal cycles. Therefore, the duration of flooding and polluted runoff would be reduced as compared to existing conditions. In all areas throughout the remaining project area, flooding associated with the 10-year storm event is reduced compared to existing conditions. No impact would occur.

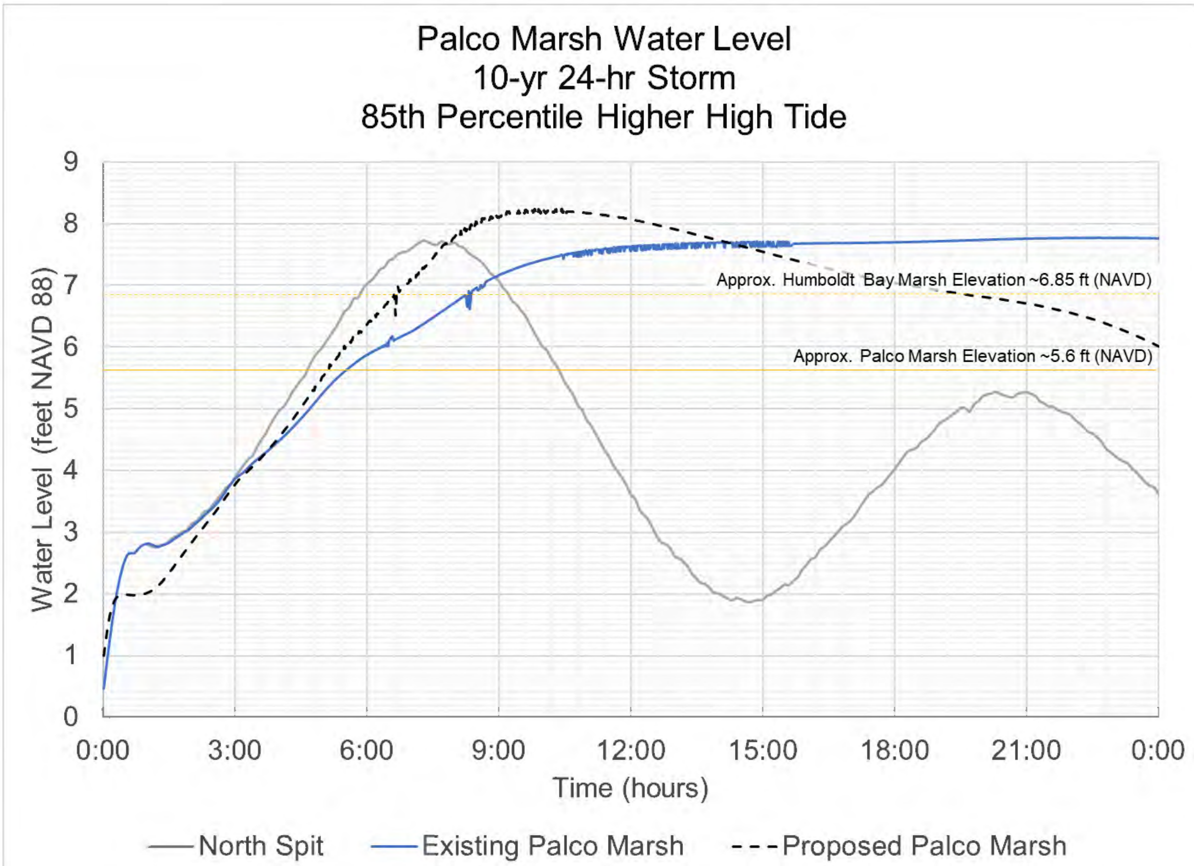

Exhibit 3-8 Existing stormwater discharge to Palco Marsh for the 10-year storm detains stormwater for multiple tidal cycles while the Project discharges the stormwater to Humboldt Bay within two tidal cycles.

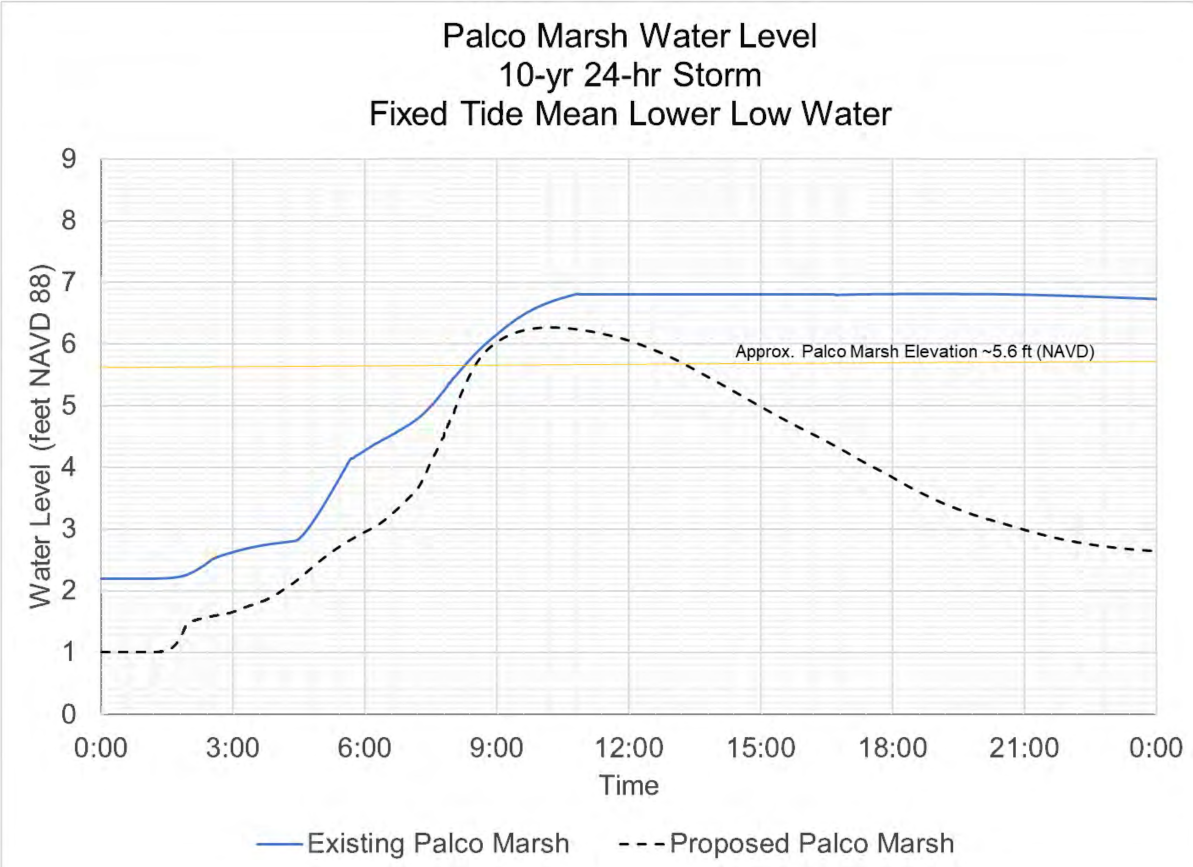

Exhibit 3-9 Without tidal influence, proposed conditions result in lower water levels and more efficient drainage within Palco Marsh.

c, iv) Impede or redirect flood flows? (Less than Significant Impact)

A portion of the Project Area is located within the FEMA 100-year flood zone (FEMA 2022), see Figure 3, in Appendix A. The Project would not include new infrastructure (such as buildings or other structures) that could impede flood flows. The LID features are designed to retain storm water flow, which could cause street drainage to pond within the vicinity of the LID features. However, potential ponding would drain eventually via the LID areas, and surrounding storm water system. Due to the absence of infrastructure or Project components that could substantially impede or redirect flood flows, a less than significant impact would occur.

d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation? (No Impact)

Implementation of the Project would reduce flooding, and would not modify the risk of tsunami. The Project site is not located near a large isolated body of water that may be affected by a seiche. Therefore, there would be less risk of inundation to flooding and less associated risk of potential pollutant release. Portions of the Project are located within the tsunami zone (DOC 2021b), however implementation of the Project would have no change on existing potential release of pollutants during a tsunami. Implementation of the Project would not introduce a new source of pollution, rather it would reduce pollution via the TCDs. Therefore, no impact would occur.

e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan? (No Impact)

The relevant water quality control plan is the NCRWQCB Basin Plan, which establishes thresholds for key water resource protection objectives for both surface waters and groundwater. The Project would obtain coverage under State Water Resources Control Board Order No. 2009-0009-DWQ, Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction and Land Disturbance Activities, which would include production and implementation of a SWPPP. The Project would also obtain a USACE Clean Water Act Section 404 and NCRWCB Clean Water Act Section 401 Water Quality Certification, which include conditions to protect water quality. The Project is not within an area where a groundwater management plan exists. These regulatory requirements would ensure a conflict with the Basin Plan does not occur. No impact would result.

3.11 Land Use and Planning

	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a) Physically divide an established community?				X
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?				X

The Project spans a wide area in the City of Eureka and crosses multiple zoning designations including Industrial zones along the western and northern extent of the Project (located near Humboldt Bay), Residential within the central portion of the Project Area, Natural Resources within the southern portion of the Project Area and some areas zoned as Public throughout the Project Area. Additionally, the Project is located both within and outside of the Coastal Zone located within the primary permitting jurisdiction of the California Coastal Commission (CCC). The Project is within the Eureka Local Coastal Program (LCP) planning area.

a) Physically divide an established community? (No Impact)

The Project would not physically divide a community because it does not include elements that would cause a physical barrier or similar division. While construction would cause temporary traffic impacts due to work in the street rights-of-way, the post-Project operations create no permanent disruption to the flow of people or goods throughout the City. No impact would result.

b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect? (No Impact)

The proposed Project would be located within the Caltrans right-of-way (Highway 101), existing City right-of-ways, City property, and the City-owned Palco Marsh. Due to the wide expanse of the Project, it encompasses numerous land use designations and zoning designations. The land use designations within the Project Area include General Industrial (GI), Light Industrial (LI), Coastal Dependent Industrial (CDI), General Commercial (GC), Public/Quasi-Public (PQP), Natural Resource (NR), Low Density Residential (LDR), Medium Density Residential (MDR), High Density Residential (HDR), and Professional Office (PO). Project Area coastal and inland zoning includes Residential Low (R1), Residential Medium (R2), Residential High (R3), Office Residential (OR), Service Commercial (SC) (abbreviated as CS within the Coastal Zone), General Industrial (MG), Limited Industrial (ML), Coastal Dependent Industrial (MC), Water Development (WD), Natural Resources (NR), Parks (P), and Public Facilities (PF). Public utilities, such as drainage infrastructures, are conditionally permitted in most zones and the Project would acquire a Conditional Use Permit prior to construction, and operation of the Project would not modify current land use or zoning designations and therefore would not conflict with zoning code regulations. Public utilities are not permissible in Natural Resource or Parks zones, however per the City's wetland fill policies, can be allowed as "incidental public service purpose." The Project would support existing land uses through improved drainage and flooding capacity.

The Project would be partially located in the Coastal Zone, within the primary permit jurisdiction of the state (and thus implemented by the CCC). Per the City of Eureka Municipal Code section 155.104.060 (G), the zoning code does not apply to public projects of the City that are outside of the Coastal Zone. For projects in the Coastal Zone, per the City's Local Coastal Program's (LCP) Implementation Plan (IP) section 10-5.2401(c), projects "requiring a use permit or minor use permit shall also require a coastal development permit." A review of the Eureka LCP elements, and the policies and standards within, did not identify any inconsistencies with the proposed Project.

The Project does not conflict with the General Plan and is specifically support by the Natural Resource (NR-), Sea Level Rise (SL-), and Water Supply and Delivery (U-) policies and goals and policies, as noted below.

- NR-1.6 Water Quality. Regulate construction and operational activities to incorporate stormwater protection measures and Best Management Practices in accordance with the City's National Pollution Discharge Elimination System to minimize adverse effects of wastewater and stormwater discharges. (RDR, MP)
- NR-1.3 Natural Open Space Areas. Preserve undeveloped natural open space areas that provide important groundwater recharge, stormwater management, and water quality benefits, such as undeveloped open spaces, gulches, natural habitat, riparian corridors, wetlands, and other drainage areas. (RDR
- SL-1.11 Reduce Damage from Peak Tidal and Storm Events. Explore and encourage innovative solutions to reduce damage from peak tidal and storm events, including the installation of hard engineered tidal barriers, installation of temporary sea gates, pump stations and off-shore structures, construction of soft engineered islands, reefs, marshes, and living shorelines, utilization of safe local waste material to implement adaptation measures, and construction of stormwater detention basins. (MP) (Imp SL-2)
- U-3.1 Adequate Infrastructure. As funding allows, continue efforts to maintain and improve the City's storm drainage system throughout Eureka to adequately accommodate stormwater runoff and prevent flooding. (MP, OFB, IGC)
- U-3.7 Stormwater Flows along the Waterfront. Continue to use best available information to identify any necessary improvements to drainage or water control structures to effectively manage stormwater flows and quality in Old Town and along the waterfront. (MP)

The Project does not conflict with other local plans or regulations such as the City's Urban Storm Water Quality Management and Discharge Control Ordinance and MS4 permit, rather the Project would improve water quality and therefore support the ordinance and permit. Additionally, the Project aligns with the Eureka Area Watersheds Storm Water Resource Plan (SWRP), a local planning document that meets the requirements of the California Water Code section 79747 and the Stormwater Resource Plan Guidelines and informs future capital improvement plans and watershed management plans (GHD 2018). The SWRP includes the Project area and a prioritized list of projects to address storm water, dry weather runoff capture, and sea level rise adaptation for the project watershed and component sub-watersheds, including some of the proposed Project activities.

Temporary wetland disturbance would occur at one location, the Palco Marsh, for channel excavation, installation of the TCD and tide gate, and installation of replacement culverts. Agencies that regulate the filling of wetlands and waters include the USACE and the NCRWQCB, and the CCC (when in the Coastal zone). Since the proposed Project would affect USACE, NCRWQCB and CCC jurisdictional wetlands, the City would obtain the necessary permits to comply with respective regulations including Clean Water Act Section 404 permit, Section 401 water quality certification and a Coastal Development Permit. Additionally, some construction would occur within the State right-of-way along US 101 and therefore the City would also acquire an Encroachment Permit from Caltrans and adhere to associated requirements.

Specific policies and regulations adopted for the purpose of avoiding or mitigating environmental effects are evaluated in this document under the corresponding issue areas. For example, an evaluation of the Project in relation to biological resources is provided in Section 3.4, Biological Resources. Evaluation of wildfire risk and local emergency evacuations is provided in Section 3.9 (Hazards and Hazardous Materials), and Section 3.20 (Wildfire). By implementing permit requirements and mitigation measures identified in Section 3.3 (Air Quality), Section 3.4 (Biological Resources), Section 3.5 (Cultural Resources), Section 3.7 (Geology and Soils), Section 3.9 (Hazards and Hazardous Materials), and Section 3.10 (Hydrology and Water Quality) above, the Project would not conflict with any applicable federal and State environmental regulations.

The proposed Project would not permanently alter the existing land uses, their designations, or their zoning, and would not introduce new land uses or land use designations or zoning; therefore, no conflict with applicable land use plans, policies, or regulation(s) would occur. No impact would result.

3.12 Mineral Resources

	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				X
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?				X

a, b) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state, or a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan? (No Impact)

The most predominant of the minerals found and mined in Humboldt County are aggregate resource minerals, primarily sand, gravel and rock, found along many rivers and streams. Although aggregate hard rock quarry mines are found throughout Humboldt County, there are no locally important aggregate or mineral resources on or in the vicinity of the Project Area. In addition, the Project is not in a mapped study area for mineral land classification (DOC 2022b). The Project would not result in the loss of known mineral resources of value to the region or state, or loss of local-important mineral resources. No impact would result.

3.13 Noise

	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a) Result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			X	
b) Result in generation of excessive groundborne vibration or noise levels?			X	
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				X

The Project is located in the City of Eureka and is surrounded by industrial, commercial, residential, and/or public land uses. The Project spans a wide urban area and crosses multiple zoning designations including Industrial zones along the western and northern extent of the Project (located near Humboldt Bay), Residential within the central portion of the Project Area, Natural Resources within the southern portion of the Project Area and various areas zoned as Public throughout the Project Area.

Current noise conditions within and near the Project Area are typical of an urban setting and consist of considerable ambient noise from traffic, industry, commercial facilities, and public uses. Traffic noise within the Project Area is substantial, due to traffic along the US 101/Broadway corridor and local traffic along surface streets.

a) Result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? (Less than Significant Impact)

Project construction would result in temporary daytime noise increases in proximity to the Project Area during the various phases of construction work. Nighttime construction would not occur. Following construction completion, Project operation would not result in increased noise levels.

Potential sensitive receptors to noise located in proximity to the Project Area include schools as listed in Section 3.9 (Hazards and Hazardous Materials, Table 3.9-1). Other sensitive receptors include childcare and senior living facilities as listed below in Table 3.13-1. Table 3.13-1 lists the business name, address, and proximity to the Project. The proximity noted in Table 3.13-1 estimates the distance from the identified sensitive receptor to the closest Project Area phase/work location.

Table 3.13-1. Schools Located in Proximity to the Project Area.

Name	Address	Proximity
Winzler Children's Center	719 Creighton St, Eureka, CA 95501	Approximately 0.41-miles southwest of Hawthorn Street Region
North Coast Learning Academy	2225-2299 K St, Eureka, CA 95501	Approximately 0.50-miles east of Williams Street Region
Kids R People 2 FCC	918 C St, Eureka, CA 95501	Approximately 0.50-miles southeast of Commercial Street Region (0.53-miles east of Washington Street Region)
Sempervirens (Psychiatric Facility)	720 Wood St, Eureka, CA 95501	Approximately 0.44-miles southeast of Williams Street Region
Especially You Assisted Living	12 Henderson St., Eureka, CA 95501	Approximately 0.41-miles southwest of Williams Street Region
The Lodge at Eureka	428 8th St., Eureka, CA 95501	Approximately 0.55-miles southeast of Commercial Street Region

Construction

Construction of the proposed Project would result in intermittent, short-term noise increases in the vicinity of the Project Area during active construction. The temporary noise increases would result from use of construction equipment to excavate and remove existing infrastructure and install Project improvements. Construction noise levels would generally be consistent with the reference noise levels in Table 3.13-2 below.

Table 3.13-2. Construction Equipment Reference Noise Levels as Measured at 50 Feet

Equipment	Noise Level (dB[2])	Equipment	Noise Level (dB)
Drill rig truck	84	Jackhammer	85
Horizontal Boring Hydraulic Jack	80	Large Generator	82
Front end loader or Backhoe	80	Paver or Roller	85
Excavator	85	Dump truck	84

Source: Federal Highway Administration 2006.

Sound from a point source is known to attenuate at a rate of -6 decibels (dB) for each doubling of distance from the source to the receptor. For example, a noise level of 84 dB Leq as measured at 50 feet from the noise source would attenuate to 78 dB Leq at 100 feet from the source and to 72 dB Leq at 200 feet. Based on the reference noise levels in Table 3.13-2, the noise levels generated by construction equipment at the Project Area may reach a maximum of approximately 85 dB Leq at 50 feet during site excavation and construction.

For measuring noise levels and setting noise standards, the City uses the Community Noise Equivalent Level (CNEL) and the Day/Night Noise Level (Ldn). The Ldn measures a weighted noise average over a 24-hour period, and adds 5 dBA (A-weighed decibel) to noise levels between 7:00 p.m. and 10:00 p.m. The CNEL uses this same methodology with the addition of 10 dBA to noise levels between 10:00 p.m. and 7:00 a.m.

The City of Eureka 2040 General Plan contains Policy N-1.13 Construction Noise. Policy N-1.13 aims to minimize construction-related noise and vibration by limiting construction activities conducted within 500 feet of noise-sensitive receptors to between 7:00 a.m. to 7:00 p.m., unless further restricted through permitting. As described in Section 1.10, construction activities will conform to these hours. Table N-3 of the Eureka 2040 General Plan allows for a maximum interior noise exposure for sensitive receptors of 45 dB for operational noise sources. The Eureka Municipal code does not include construction noise-related standards or regulations, thus the applicable City of Eureka General Plan policies have been used as guidance for impact analysis.

[2] "dB" is a weighted decibel measurement for assessing hearing risk and, therefore, is used by most regulatory compliance.

Adherence to Policy N-1.13, which limits construction activity hours to 7 am through 8 pm when within 500 feet of noise-sensitive land uses, would limit construction noise intensity and duration such that construction noise exposure for sensitive receptors would be reduced. Construction-related noise would be short-term and limited to hours of construction as defined in the City's General Plan.

All Project locations would experience a temporary increase in noise as a result of construction activities. Construction would involve equipment producing upwards of 85dB measured at 50 feet. Project construction activities that do not require heavy equipment would not create excessive noise. Construction activities occurring within existing street rights-of way would be completed within one to eight weeks for any given segment depending on length of segment. However, given a segment may be up to 4,000 feet in length, construction would occur along the segment and not in one stationary location within the segment for the estimated one to eight weeks of time.

At the nearest sensitive receptor, the noise levels generated during construction would attenuate to near or below the City's 45 dBA threshold limit for maximum allowable interior noise exposure for residential units (inside measurement) as shown in Table N-3 of the City's General Plan. While the maximum noise levels generated during construction could result in short-term increases in noise, construction-related noise would not constitute a significant impact, as such work would be short-term and conform to the City's General Plan policies.

The incremental increase in noise in the Project Area would not expose persons to noise levels in excess of established standards and would not represent a substantial increase in noise. Therefore, the potential impact from construction-related noise would be less than significant.

Operation

Operational activities associated with the Project include maintenance of storm water infrastructure. Noise at the Project Area during these activities would not measurably exceed the existing background noise levels because only infrequent vehicular access, minor repairs, and maintenance would be required. None of the project components are expected to produce operational noise in excessive of the pre-project baseline. The majority of the project consists of underground stormwater infrastructure. The Project infrastructure would not include associated onsite pump or mechanical equipment that would produce operational noise. No impact would result.

b) Result in generation of excessive groundborne vibration or noise levels? (Less than Significant Impact)

Excavation, demolition, and soil compacting activities using heavy machinery would create groundborne vibrations and noise that may be noticeable to nearby sensitive receptors on a temporary basis during construction activities. Noticeable groundborne vibrations and noise would be limited to typical daytime construction working hours. Groundborne vibrations beyond baseline conditions are not anticipated as a result of Project operational activities.

The City has not established vibration limits to minimize the potential for cosmetic damage to buildings. However, Caltrans recommends a vibration limit of 0.5 inches/second peak particle velocity (PPV) for buildings structurally sound and designed to modern engineering standards, 0.3 inches/second PPV for buildings that are found to be structurally sound but where structural damage is a major concern, and a conservative limit of 0.08 inches/second PPV for ancient buildings or buildings that are documented to be structurally weakened. No known buildings that are documented to be structurally weakened or ancient adjoin the Project Area. Therefore, the 0.5 inches/second PPV limit would apply when considering the potential for groundborne vibration levels to result in a significant vibration impact.

The noise and vibration evaluation assessed typical vibration levels that could be expected from construction equipment at a distance of 25 feet, inclusive of required equipment and methods for all four potential construction options. Project construction activities, such as drilling, the use of jackhammers, and other high-power or vibratory tools, and rolling stock equipment (tracked vehicles, compactors, etc.) may generate substantial vibration in the immediate vicinity, but will be limited to within the roadway right-of-way in developed areas.

Table 3.13-3 presents typical vibration levels that could be expected from construction equipment at a distance of 25 feet (Caltrans 2020). High-power or vibratory tools and rolling stock equipment (e.g., tracked vehicles, compactors), may generate substantial vibration in the immediate vicinity. Vibration levels are highest close to the source and attenuate with increasing distance. Vibration levels would vary depending on soil conditions, construction methods, and equipment used.

Table 3.13-3. Typical Vibration Levels for Construction Equipment Used During Project Construction

Equipment	Reference PPV at 25 ft. (in/sec)
Vibratory Roller	0.210
Large Bulldozer	0.089
Caisson drilling	0.089
Loaded trucks	0.076
Jackhammer	0.035
Small bulldozer	0.003
Crack-and-seat operations (specific pavement rehabilitation process)	2.4

Project-related activities would not involve the use of explosives or other intensive construction techniques that could generate significant ground borne vibration or noise. No pile driving is anticipated; however, the Project may utilize a vibratory roller, bulldozer, and jackhammer. As shown in Table 3.13-3, vibratory rollers may be expected to generate the highest vibration levels of 0.210 inches/second PPV at a distance of 25 feet (Caltrans 2020).

Vibration impacts to residences are anticipated to be minor as the closest residences are generally located greater than 25 feet away from the Project Area and often at a higher grade than the work causing the vibration (at the roadway surface or storm drains). As shown in Table 3.13-3, a residence at a distance of approximately 25 feet away from a vibratory roller would be exposed to vibration levels up to 0.21 inches/second PPV, which is substantially less than the applicable 0.5 inches/second PPV threshold.

Minor vibration adjacent to mechanized equipment and road treatments during construction work would be generated only on a short-term basis. Noise impacts from groundborne noise to humans are anticipated to be minor. Therefore, groundborne vibration and noise from the Project would have a less than significant impact.

Following construction, operation of the Project would not result in substantial sources of groundborne vibration or groundborne noise above background conditions. Project operation would not generate vibration, except in instances where larger repairs to infrastructure might be required. These conditions would be short-term and temporary (taking from one to several weeks to complete depending on the extent of damage or other circumstances); therefore, no operational impact would result.

c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels? (No Impact)

As noted in Section 3.9 (Hazards and Hazardous Materials), the Project's Railroad Street component and staging area are located approximately 1.3 miles west and across Humboldt Bay from Samoa Field (O33). As discussed in Section 3.9(e), no impact on O33 would result from the Project.

Project construction would result in temporary, short-term noise and vibration typical of that commonly conducted within urban areas and along roadways. As noted above in Subsections a) and b), intermittent noise and vibration impacts associated with the Project would be less than significant. None of the Project components are expected to produce operational noise in excess of pre-Project conditions.

The Project includes ground level and subsurface stormwater improvements and would not include any residential or commercial construction, therefore would not introduce new permanent residents or employees to the Project Area. Once constructed, the Project would not encourage people into the Project Area. As such, there would be no impact to people from exposure to excessive noise levels attributable to airport operations and flights.

The Project would not impact the nearest airport (O33), would not conflict with the established ALUCP, would not induce growth, and Project construction would comply with established General Plan policies; therefore no impact would result.

3.14 Population and Housing

	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?			X	
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?				X

The 2020 population for the City was estimated to be 26,512 people (US Census 2020). The proposed Project would replace and improve existing municipal storm water infrastructure and install new storm water infrastructure for continued service to the existing community population. The objective of the Project is to increase the storage capacity and conveyance of the storm drain network, implement flow attenuation and water quality improvements, and enhance tidal circulation to provide flood reduction and sea level rise resiliency; not to advance or facilitate future population growth.

a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)? (Less than Significant Impact)

The proposed Project does not include components that would directly or indirectly induce unplanned population growth. The key Project elements consist of the replacement of undersized storm drainpipes with larger diameter pipes, installation of tide gates and TCDs at strategic locations within the system, installation of LID features at planned intersections, Palco March excavations to increase storage capacity and replacement of the Palco Marsh outfall.

Project would improve water quality and is in alignment with the City's Urban Storm Water Quality Management and Discharge Control Ordinance and MS4 permit, and Project elements are included in the City's SWRP, which informs future capital improvement plans and watershed management plans, and are therefore planned elements by the City. The Project does not include the extension of utilities or roads or other infrastructure into outlying or exurban areas and would not directly or indirectly lead to the development of new sites that would induce population growth. Therefore, a less than significant impact would result.

b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere? (No Impact)

With the exception of the Palco Marsh channel excavation, the Project would be constructed in City right of ways or previously disturbed areas that are already utilized for storm water collection and conveyance. The Project would not displace people or housing, or otherwise effect housing. The Project does not include modification or construction of housing. No impact would result.

3.15 Public Services

	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire Protection?			X	
Police protection?			X	
Schools?				X
Parks?			X	
Other public facilities?			X	

The Project would result in an overall benefit to public services by reducing the frequency of flooding, improving the reliability of the stormwater drainage system, reducing the conveyance of trash into Humboldt Bay and improving groundwater recharge via LID features. It supports the City's planning goals and corrects deficiencies noted in the City Storm Water Resource Plan (GHD 2018).

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for public services? (Less than Significant Impact)

The Project is entirely within the City of Eureka, and City of Eureka Police Department and Humboldt Bay Fire currently serve the Project Area.

The Project itself results in improvements to public utility facilities. The Project improvements would not result in the need to increase staffing, create new hazardous conditions, or result in a modification to the road system that would restrict access for emergency services. The Project improvements consist of passive, largely subterranean stormwater system improvements.

Additional police protection is not required because the Project would not require increased stormwater maintenance staffing. The above-ground Project components (e.g. two of the TCDs, and LID features) would be unlikely to be the target of theft or vandalism.

The Project would not affect schools because it would not induce population growth. The Project may temporarily limit access along the Waterfront Trail during construction (as discussed in Section 3.16 – Recreation), however would not affect public parks during Project operation. For the reasons stated above, the Project would result in a less-than-significant impact to public services.

3.16 Recreation

	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				X
b) Include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?				X

The southernmost Project components are located 0.25-miles from Carson Park and 0.30 miles from 20-30 Park, two City-owned public parks. The westernmost Project components would be implemented along Palco Marsh and West Del Norte Street, located adjacent to the Waterfront Trail and trailhead which is part of the publicly accessible California Coastal Trail, the Del Norte Pier which is a public fishing pier, and the Eureka City Dog Park.

a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? (No Impact)

The Project does not propose new homes, businesses, or roads that would result in direct or indirect population growth which could indirectly increase use of existing neighborhood and regional parks, rather it is a flood reduction and sea level rise resiliency project. Project construction would not require the use of recreational facilities such that physical deterioration would occur or be accelerated. However, Project construction may include temporary limitations of Waterfront Trail usage from the West Del Norte St trailhead south into Palco Marsh due to pipe installation along West Del Norte St. and Palco Marsh improvements. Public access limitations, if any, would be temporary and likely occur for four to eight weeks over an approximately 0.25-mile area. An alternative pathway around the construction area (utilizing Del Norte Street and Felt Street, and potentially Wabash Avenue) exists for the public to use should access along the Waterfront Trail within Palco Marsh, or at portions of Del Norte St become temporarily limited. Operation of the Project facilities would not substantially increase the usage of or demand for existing neighborhood and regional parks or other recreational facilities. Therefore, the Project would not increase the use of regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. No impact would occur.

b) Include or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment? (No Impact)

The proposed Project does not include the construction or expansion of recreational facilities. Therefore, no impact would result.

3.17 Transportation

	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?			X	
b) Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?				X
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?			X	
d) Result in inadequate emergency access?			X	

a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities? (Less than Significant Impact)

Construction would result in vehicle trips by construction workers and haul-truck trips for material off-haul and deliveries via Highway 101, Del Norte Street, California Street, and other major arterial roads within Eureka. Construction-related traffic would be temporary, would vary on a daily basis, and would be distributed over the course of a work day and work week. The number of construction-related vehicles traveling to and from the Project Area would vary on a daily basis. As described in Section 1.6, construction hours would be limited to 7:00 a.m. to 6:00 p.m. Monday through Friday and 8:00 a.m. to 5:00 p.m. on Saturdays. Construction would not occur on Sundays. Night time construction would not occur. Due to the infrequency of truck traffic and the temporary nature of construction, Project construction is not anticipated to conflict with plans, policies or programs related to the effectiveness of the circulation system. During construction, a less than significant impact would occur.

The Project does not involve a permanent modification of the City of Eureka street network with the exception of the LID features which would occur within the footprint of existing intersections and tide gates which would occur adjacent to, but outside of, the street network. No operational changes to the existing street network would occur under the Project. Impacts to local streets would be limited to the construction phase of the Project, after which all streets would be restored to their pre-Project condition, with the exception of the LID features which would provide greenery and improved drainage and aesthetic compared to pre-Project conditions at the Del Norte and California Street, and Sonoma and California Street intersections. No operational impact would occur.

b) Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)? (No Impact)

CEQA Guidelines Section 15064.3 (Determining the Significance of Transportation Impacts) specifies that Vehicle Miles Travelled (VMT) is the primary metric or measure of effectiveness for determining the significance of transportation impacts across California. VMT refers to the amount and distance of automobile travel attributable to a project. The Governor's Office of Planning and Research (OPR) has published a Technical Advisory on Evaluating Transportation Impacts in CEQA (OPR 2018) which contains guidance on methodology and recommendations for establishing screening criteria and thresholds for VMT evaluation, which is used to evaluate impacts in this Initial Study. OPR's Technical Advisory specifies that transportation impact analysis be based on either a project's VMT per capita (or other efficiency metric like VMT per household, per employee) or total VMT change (before and after project). As noted in OPR's Technical Advisory, projects that would not likely lead to a substantial or measurable increase in vehicle travel, and therefore generally should not require an induced travel analysis, include addition of Class I bike paths, trails, multi-use paths, or other off-road facilities that serve non-motorized travel (OPR 2018). The Project would replace stormwater piping, install LID features, tidegates, and improve drainage in the Palco Marsh. Maintenance of the Project would occur consistent with the existing City's maintenance schedule. Therefore, due to the absence of transportation oriented Project elements, the Project would not add additional motor vehicle capacity to the roadway network and would not lead to additional vehicle miles travelled. No impact would result.

c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? (Less than Significant Impact)

The Project would not result in an alteration in the geometric design of a street or road. The proposed LID features would be located within the footprint of the existing sidewalk, and would therefore not substantially increase potential hazards due to geometric design. There are no changes to land use associated with this Project. A less than significant impact would result.

d) Result in inadequate emergency access? (Less than Significant Impact)

Construction activities would primarily occur within segments of municipal streets. Construction would be phased such that not all streets would be impacted at any one time during construction. Construction related traffic would consist of earthwork equipment and support vehicles. Temporary lane closures of City streets and Broadway Street (which is under Caltrans jurisdiction) would be required for pipeline, LID and tidegate installations and would require traffic control. A standard Caltrans-approved traffic control plan would be implemented, as required by the forthcoming Caltrans Encroachment Permit. Although temporary lane closures are anticipated, emergency access would be retained throughout construction. The potential impact would be less than significant.

3.18 Tribal Cultural Resources

	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a) Cause a substantial adverse change in the significance of a tribal cultural resource listed or eligible for listing in the California Register of Historic Resources, or in a local register of historic resources as defined in Public Resources Code section 5020.1(k)?				X
b) Cause a substantial adverse change in the significance of a tribal cultural resource that is a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to the criteria set forth in subdivision (c) of the Public Resources Code section 5024.1? In applying the criteria set forth in subdivision (c) of the Public Resources Code section 5024.1, the lead agency shall consider the significance of the resource to a California Native American Tribe.				X

a,b) Cause a substantial adverse change in the significance of a tribal cultural resource? (No Impact)

CEQA requires lead agencies to determine if a project would have a significant effect on tribal cultural resources. The CEQA Guidelines define tribal cultural resources as: (1) a site, feature, place, cultural landscape, sacred place, or object with cultural value to a California Native American Tribe that is listed or eligible for listing on the California Register of Historical Resources, or on a local register of historical resources as defined in Public Resources Code Section 5020.1(k); or (2) a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant according to the historical register criteria in Public Resources Code Section 5024.1(c), and considering the significance of the resource to a California Native American tribe.

As part of the AB 52 process, the City sent notifications for the opportunity to consult to appropriate tribal governments as identified by the Native American Heritage Commission. Notifications were distributed on May 3, 2022 to the Bear River Band of Rohnerville Rancheria, Blue Lake Rancheria, Cher-Ae Heights Indian Community of the Trinidad Rancheria and the Wiyot Tribe. A 30-day period allowing for a request for consultation ended with no request made for consultation. Tribal historic resources were thus not identified.

Additionally, Roscoe and Associates contacted the NAHC on February 18, 2021, to request a review of their Sacred Lands Files. The NAHC staff responded by email on March 23, 2021, stating that the Sacred Lands File search was negative, and provided a list of Tribal representatives and individuals to be contacted regarding the Project. On February 18, 2021, Roscoe and Associates sent Request for Comment letters to the following Native American representatives as part of the Cultural Resources Inventory Report prepared for the Project (Roscoe and Associates 2021):

- Bear River Band of the Rohnerville Rancheria
- Blue Lake Rancheria
- Wiyot Tribe

Responses were received from THPOs of the Blue Lake Rancheria and Wiyot Tribe in March 2021, regarding locations of potential vulnerable cultural resources, however correspondence from tribes specific to Tribal Cultural Resources has not occurred. Potential impacts and measures to reduce potential impacts to cultural resources is discussed in Section 3.5 (Cultural Resources). Given no Tribal Cultural Resources have been identified, the Project would have no impact.

3.19 Utilities and Service Systems

	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electrical power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?			X	
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?				X
c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				X
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?			X	
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?				X

The Project is a public utility project designed to upgrade the existing storm water distribution system via larger diameter piping, TCDs, LID and increased storage capacity within Palco Marsh. It benefits the City and its population by reducing likelihood of flooding, reducing trash conveyance into Humboldt Bay, and improving groundwater recharge.

a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electrical power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects? (Less than Significant Impact)

The Project would result in the replacement of storm water infrastructure with larger diameter piping. Proposed storm water piping would be installed in the same footprint as existing piping, and the existing piping would be removed. One section of proposed piping along Del Norte Street is new, i.e. it would not replace existing piping. The tide gates and TCDs would be installed in conjunction with storm water piping. The LID features would be at surface level and would replace impervious surface with permeable storm water retention areas. Proposed excavations within Palco Marsh would enable additional storage capacity of storm water from the adjacent existing drainage inlet. All proposed Project work would improve storm water conveyance, increase storage capacity within Palco Marsh, reduce conveyance of garbage into Humboldt Bay, improve groundwater recharge, and would not result in adverse environmental effects. A less than significant impact would occur.

b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years? (No Impact)

During construction, Eureka municipal water supplies could potentially be used for dust control and other activities. Construction-related water demands would be short-term and minimal in volume. If utilized, HDD-related water would be tanked to the site. Following construction, the Project would not directly or indirectly induce population growth and would not result in an increased demand for water. Therefore, no new entitlements or facilities would be required. No impact would result.

c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments? (No Impact)

The Project would not directly or indirectly induce population growth and would not increase the amount of wastewater generated. Municipal water service would remain operational during construction; service would not be disrupted. No impact would result.

d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals? (Less than Significant Impact)

Construction of the Project would result in a temporary increase in solid waste disposal needs associated with demolition and construction wastes. Construction wastes would include, but not be limited to, excavated soils, construction waste resulting from pipe replacements (such as jackhammered concrete and segments of piping to be removed), concrete removal from LID installation area, drilling mud or other HDD-related wastes. Construction waste with no practical reuse or that cannot be salvaged or recycled would be legally disposed of at a local transfer station. If HDD is utilized, drill spoils would be collected via vacuum trucks and hauled from the site by the contractor for legal disposal.

Active permitted in-County transfer stations include the Humboldt Waste Management Authority facilities in Eureka or Samoa, California and the Recology Eel River Transfer Station in Fortuna, California. Solid waste generated by the Project would represent a small fraction of the daily permitted tonnage of these facilities. This would be a less than significant impact on landfill capacity with the implementation of federal, state, and local statutes and regulations related to solid waste. Therefore, the Project's construction-related solid waste disposal needs would be sufficiently accommodated by existing landfills, and the impact would be less than significant. Following construction, Project operation would involve routine cleaning of TCDs, which would not exceed any regulatory threshold. A less than significant impact would occur.

e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste? (No Impact)

No applicable federal solid waste regulations would apply to the Project. At the State and local level, the Integrated Waste Management Act mandates a reduction of waste being disposed and establishes an integrated framework for program implementation, solid waste planning, and solid waste facility and landfill compliance. The Project would not conflict with or impede implementation of such programs. Following construction, Project operation would include routine cleaning of TCDs. No constructional or operational impact would occur.

3.20 Wildfire

	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?				X
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?			X	
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?			X	
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides as a result of runoff, post-fire slope instability, or drainage changes?			X	

This section evaluates potential impacts related to wildfire risk; no portion of the Project Area is located within or near a State Responsibility Area (SRA) where Cal Fire is the primary emergency response agency responsible for fire suppression and prevention. The Project Area is not located in an SRA or lands classified as very high fire severity zones. The Project Area is entirely located in a local responsibility area (LRA) meaning an area where local governments have financial responsibility for wildland fire protection (CAL FIRE 2022).

a) Substantially impair an adopted emergency response plan or emergency evacuation plan (No Impact)

The 2015 Humboldt County EOP describes the actions that the City would take to manage operations in case of an emergency. Emergency access would remain operable throughout construction. No Project elements would impair the City's ability to response to an emergency as described in the plan. No detrimental impact would result.

b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire? (Less than Significant Impact)

The Project Area includes very low slopes in the City of Eureka where windy conditions are common. Fire ignition risk associated with construction activities is low and limited to accidental ignition associated with a potential heavy machinery-related incident. The majority of work is planned to occur within paved areas, further reducing the potential for fire ignition. The Project would not otherwise increase exposure to wildlife fire above existing conditions. The impact would be less than significant.

c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment? (Less than Significant Impact)

The Project is predominantly located either adjacent or subsurface to paved roadways, with some Project components within Palco Marsh. Maintenance of Project infrastructure would be similar to existing City maintenance operations, with the exception of cleaning out the TCDs which would be a new element to the City's maintenance schedule. Cleaning out the TCDs would involve removal and disposal of debris and garbage built up in the TCD netting, and would not exacerbate fire risk because vehicles, and other equipment would be within a developed area where there is a lack of flammable materials. Ongoing operation and use of the Project after construction is complete would not result in an exacerbated fire risk. A less than significant impact would occur.

d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides as a result of runoff, post-fire slope instability, or drainage changes? (Less than Significant Impact)

Project construction would not expose people or structures to significant risk. The Project is located in the low-lying, generally flat developed lands within the City of Eureka. The immediate Project Area is not forested, although some vegetation is present. Fire ignition risk associated with construction activities is low. Because the Project is located in flat lands and due to low fire ignition risk, the risk of flooding or landslides associated with post-fire slope instability or changes in drainage is low. The impact is less than significant.

3.21 Mandatory Findings of Significance

	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Does the project:				
a) Have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?		X		
b) Have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?			X	
c) Have environmental effects which would cause substantial adverse effects on human beings, either directly or indirectly?			X	

a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory? (Less than Significant Impact with Mitigation)

As evaluated in this ISMND, the Project would not substantially degrade the quality of the environment; substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; reduce the number or restrict the range of an endangered, rare, or threatened species; or eliminate important examples of the major periods of California history or prehistory.

Mitigation measures are listed herein to reduce impacts related to air quality, biological resources, cultural resources, energy resources, geology and soils, hazards and hazardous materials (related to releases that may impact biological resources), and hydrology and water quality. With implementation of the required mitigation measures, impacts would be less than significant.

b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)? (Less than Significant Impact)

Cumulative impacts are defined as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (CEQA Guidelines § 15355). Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

As discussed in Section (3.10 Land Use and Planning), the Project is consistent with the goals and policies of the City of Eureka 2040 General Plan and LCP. The improvement of utility systems and increased resiliency to flooding and sea level rise uphold General Plan and LCP policies.

The following projects are ongoing or proposed and serve, for the purposes of this report, to judge the cumulative impacts of the Project discussed in this ISMND.

City of Eureka Projects

Fish Passage Projects. The City of Eureka received funding from the Fisheries Restoration Grant Program (FRGP) to implement the planning and design phase of the First Slough Fish Passage Floodplain Restoration and Coastal Habitat Connectivity Project. This project would remove three barriers in the First Slough watershed at the 14th Street, N Street, and M Street crossings. The construction timeline for this project is currently unknown. The project does not overlap with the Project considered in this ISMND and would therefore have no cumulative impact. The City has also been exploring funding for fish passage projects related to Second Slough (i.e. McFarlan Creek), however funding is not yet secure for the second Slough project.

Trail Projects. The City's Bay to Zoo Trail is proposed on a north south alignment in the eastern portion of the City. It does not overlap the proposed Project considered in this ISMND at any location. Funding for the Bay to Zoo Trail is not yet secured, and the date of construction is unknown. An Initial Study and Mitigated Negative Declaration was prepared and adopted by the City (lead agency) for this project (SCH# 2021030609).

Eureka City Schools Projects

Improvements to the Eureka High School athletic facilities are currently underway, as of the date of this ISMND. The proposed Project does not overlap with this project, and project permits would require the implementation of BMPs to protect water resources and air quality, thereby avoiding a cumulative impact. No additional major construction projects are known to occur, or be planned to occur, within Eureka City schools in the foreseeable future.

Humboldt County Projects

The proposed North McKay Ranch Subdivision Project (SCH: #2019049166) is a mixed-use subdivision project that would contain single-family and multifamily residential uses as well as commercial uses on a site located approximately 0.3 miles south east of the proposed trail's southern terminus. The Draft EIR was released in May 2020 and is being considered by the County of Humboldt. This project does not overlap or drain into the proposed Project considered in this ISMND.

The Humboldt Bay Trail South (SCH#: 2018022036) would connect the Eureka Waterfront Trail to Arcata via a new Class 1 multi-use trail that will run along Highway 101. An Initial Study and Mitigated Negative Declaration was prepared and adopted by the County of Humboldt (lead agency) for this project. A Notice of Determination (NOD) was recorded on October 23, 2018. This project does not overlap or have a direct connection to the proposed Project considered in this ISMND.

Additionally, the Nordic Aquafarms Project (SCH#: 2021040532) is proposed along the Samoa peninsula, outside of City limits. Potential environmental impacts of both projects, as described in the Draft EIRs (and Final EIR for the Nordic project), are not expected within the Project Area and vice versa as a result of the physical distance and lack of hydrologic or habitat connectivity between the two projects.

Caltrans Projects

Per communication with Jesse Robertson of Caltrans on July 19, 2022, there is one project currently under construction and two projects planned for the foreseeable future (through 2023) within the City of Eureka. The project currently under construction includes ADA-compatible curb and ramp upgrades located between Herrick Avenue and 14th Street. This project overlaps the proposed Project spatially, however temporally the projects would not overlap because the curb and ramp upgrades project is currently underway. The two future projects are the Broadway Complete Streets pedestrian infrastructure project located in southern Eureka between Highway 101 northbound off ramp and Truesdale Street, and the installation of a cable between 4th and 5th streets along Commercial Avenue. These projects do not spatially overlap with the elements of the proposed Project. Additionally, according to research of other CEQA documents in the Eureka vicinity, the Eureka Slough Bridge project is scheduled for construction in

2028.The Eureka Slough Bridge is located in the northeast portion of the City, and does not overlap with proposed Project elements. An environmental impact assessment would be performed consistent with Caltrans’ established processes. As both projects would include BMPs and other preventative measures and permitting requirements to avoid potential impacts to water quality in Eureka Slough and Humboldt Bay, the potential for cumulative water quality impacts or aquatic biological resources in Eureka Slough and Humboldt Bay is extremely limited.

The Project impacts would not add appreciably to any existing or foreseeable future significant cumulative impact, such as visual quality, cultural resources, biological, traffic impacts, or air quality degradation. Incremental impacts, if any, would be negligible and undetectable. Any applicable cumulative impacts to which this Project would contribute would be mitigated to a less-than-significant level. Incremental impacts, if any, would be very small, and the cumulative impact would be less than significant. Because the proposed Project would not result in significant impacts after mitigation, and because the proposed Project is a storm water infrastructure improvement project rather than a development project that could add to existing and future population growth and development in the area (such as drinking water or wastewater infrastructure), the proposed Project would not contribute to any significant cumulative impacts which may occur in the area in the future. Therefore, the impact would be less than significant.

c) Does the project have environmental effects which would cause substantial adverse effects on human beings, either directly or indirectly? (Less than Significant Impact)

The Project has been planned and designed to avoid significant environmental impacts. As discussed in the analysis throughout Section 3 of this ISMND, the Project would not have environmental effects that would cause substantial adverse direct or indirect effects on human beings. The impact would be less than significant.

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5. Report Preparers

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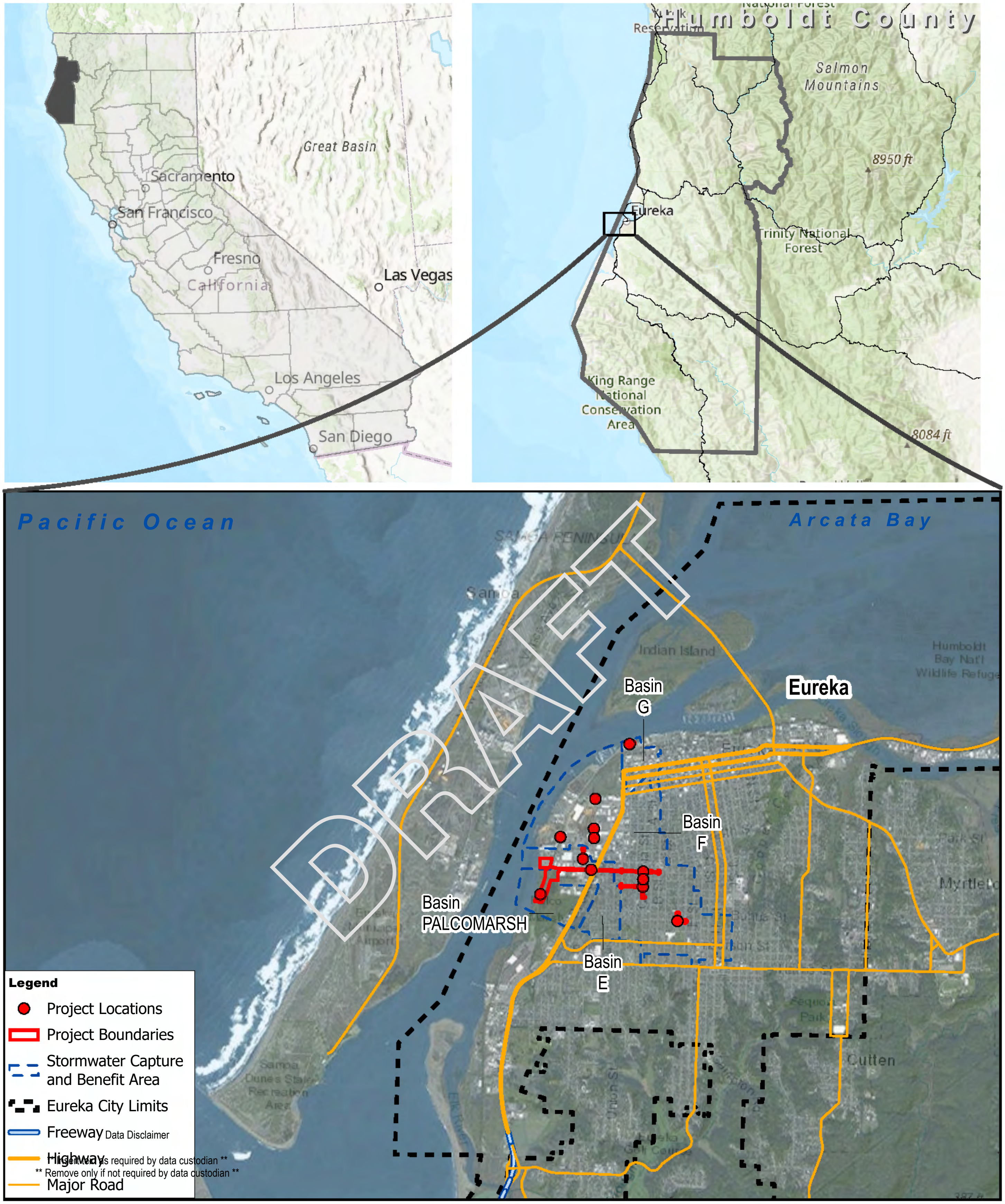
Appendices

Appendix A

Figures



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City of Eureka
Flood Reduction and
Sea Level Rise Mitigation Project

Project Concept
Location Map

Project No. **12566459**
Revision No. **-**
Date **Jun 2022**

FIGURE 1

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City of Eureka
Flood Reduction and
Seal Level Rise Resiliency Project

Project No. **12566459**
Revision No. **A**
Date **Jul 2022**

Project Boundary Map

FIGURE 2

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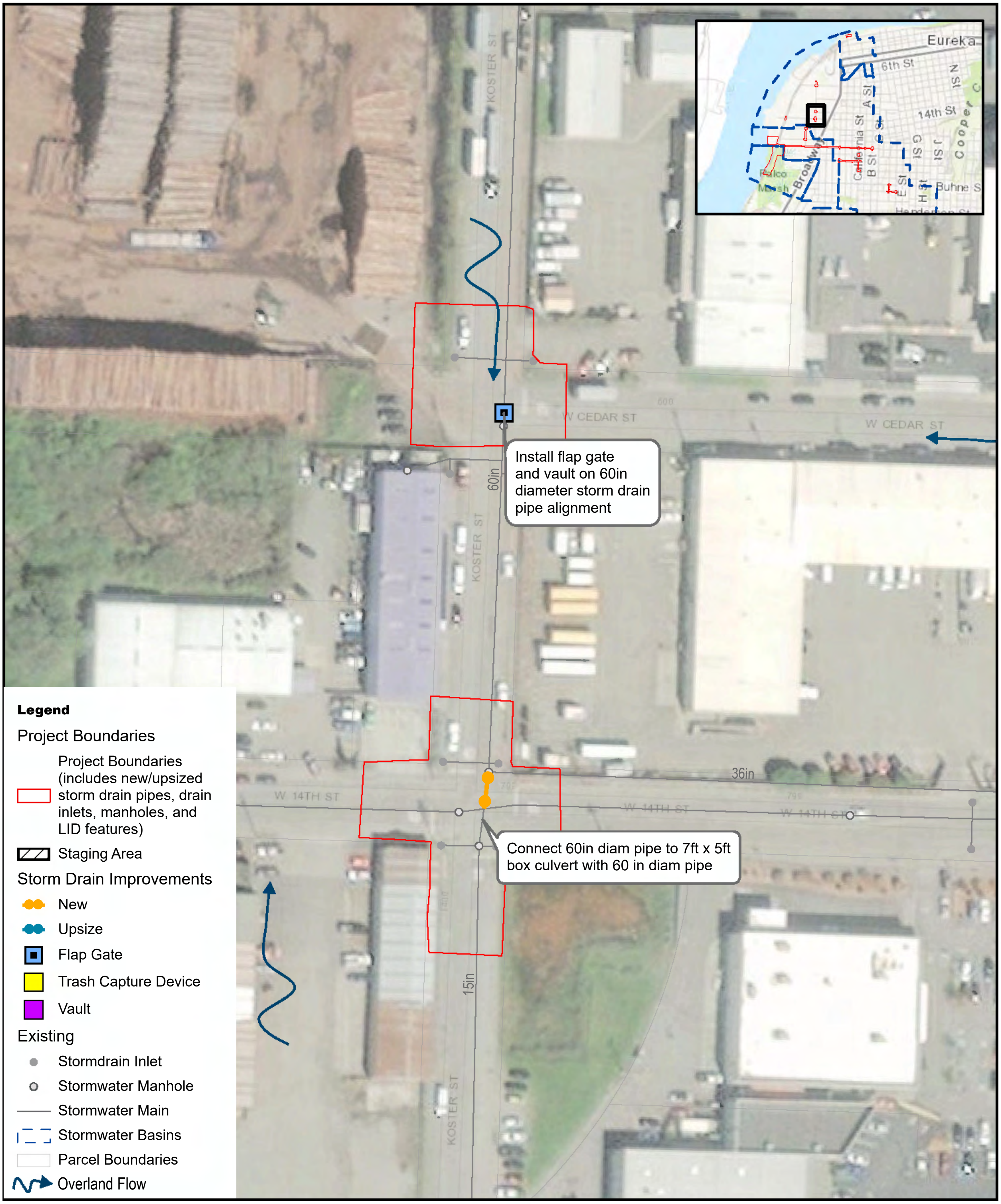

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City of Eureka
Flood Reduction and
Seal Level Rise Resiliency Project

Project Concept
Koster Region

Project No. **12566459**
Revision No. **-**
Date **Jun 2022**

FIGURE 2.1

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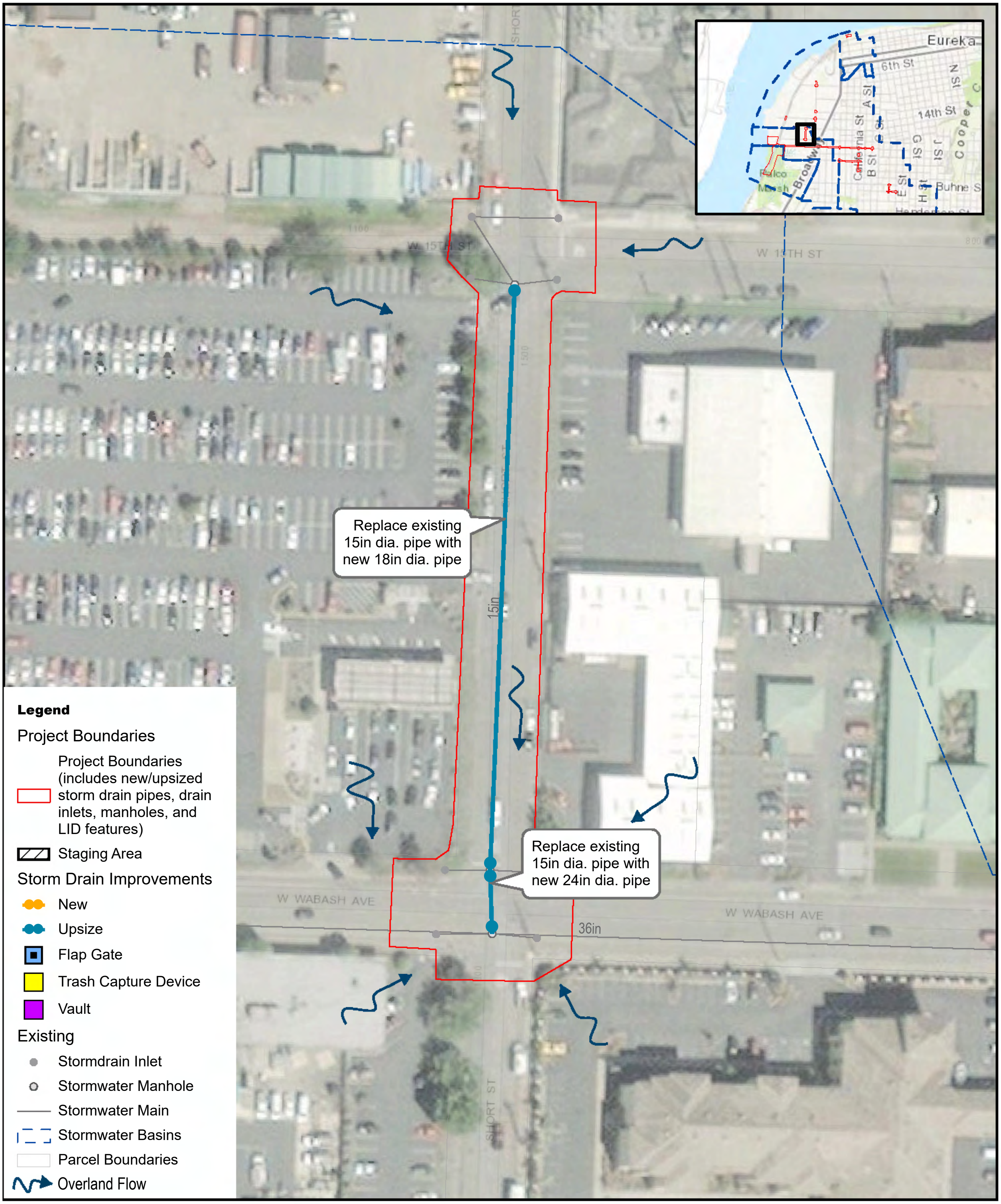

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City of Eureka
Flood Reduction and
Seal Level Rise Resiliency Project

Project Concept
Short Region

Project No. **12566459**
Revision No. **-**
Date **Jun 2022**

FIGURE 2.2

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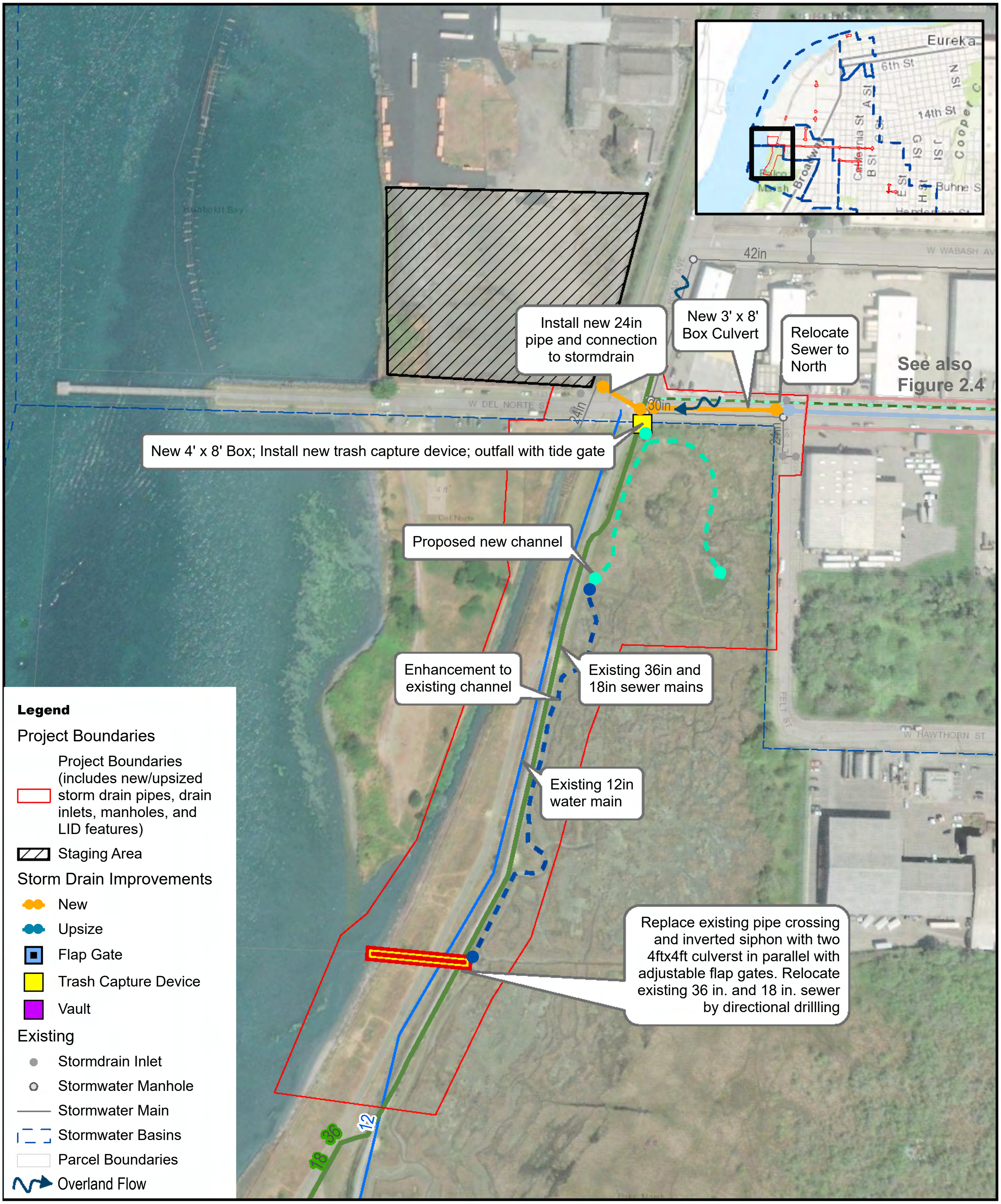

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City of Eureka
Flood Reduction and
Seal Level Rise Resiliency Project

Project Concept
Railroad Region & Staging Area

Project No. **12566459**
Revision No. **A**
Date **Jul 2022**

FIGURE 2.3

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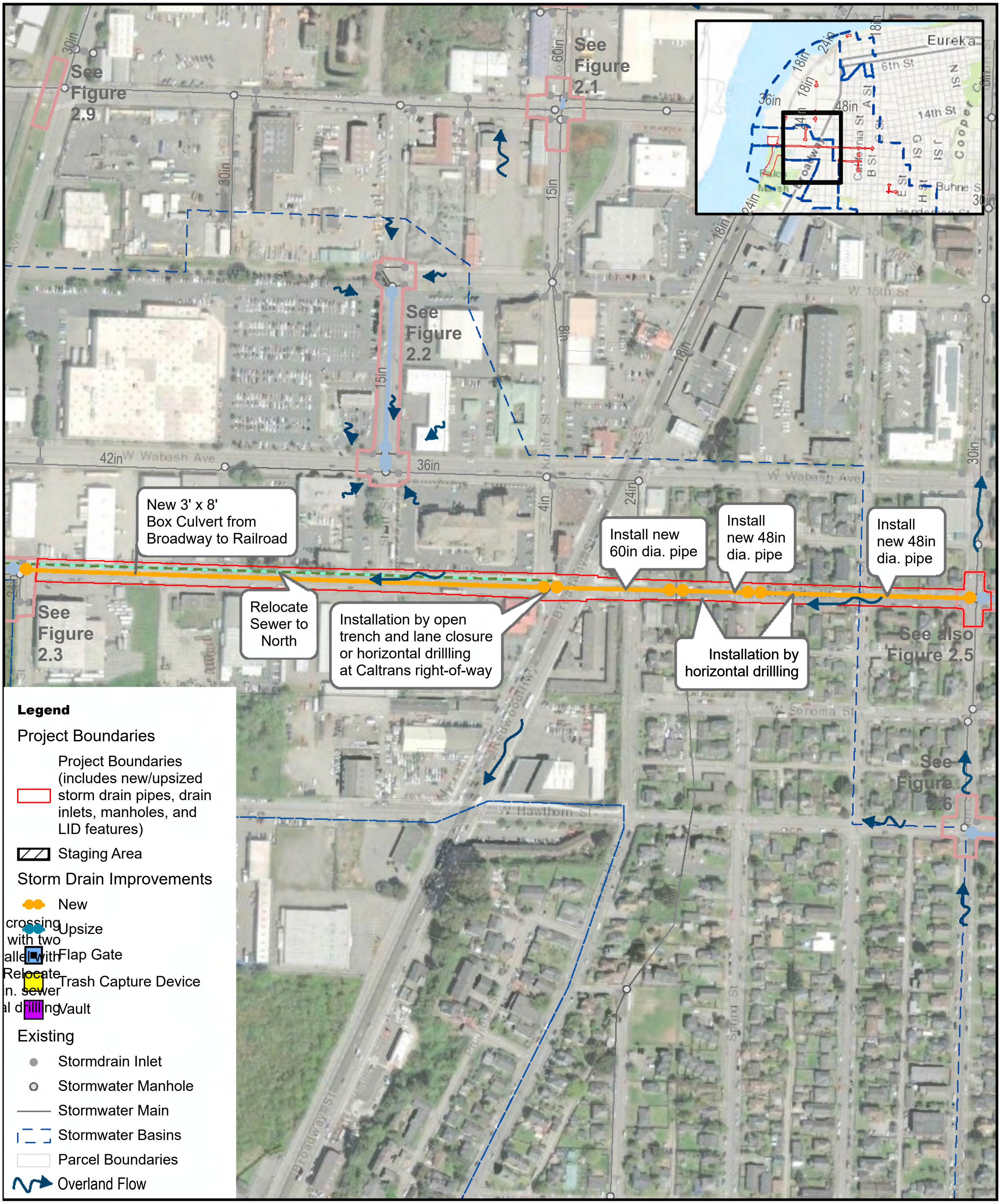

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City of Eureka
Flood Reduction and
Seal Level Rise Resiliency Project

Project Concept
Del Norte Region - West

Project No. **12566459**
Revision No. **-**
Date **Jun 2022**

FIGURE 2.4

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City of Eureka
Flood Reduction and
Seal Level Rise Resiliency Project

Project Concept
Union, California, Del Norte Region - East

Project No. **12566459**
Revision No. **-**
Date **Jun 2022**

FIGURE 2.5

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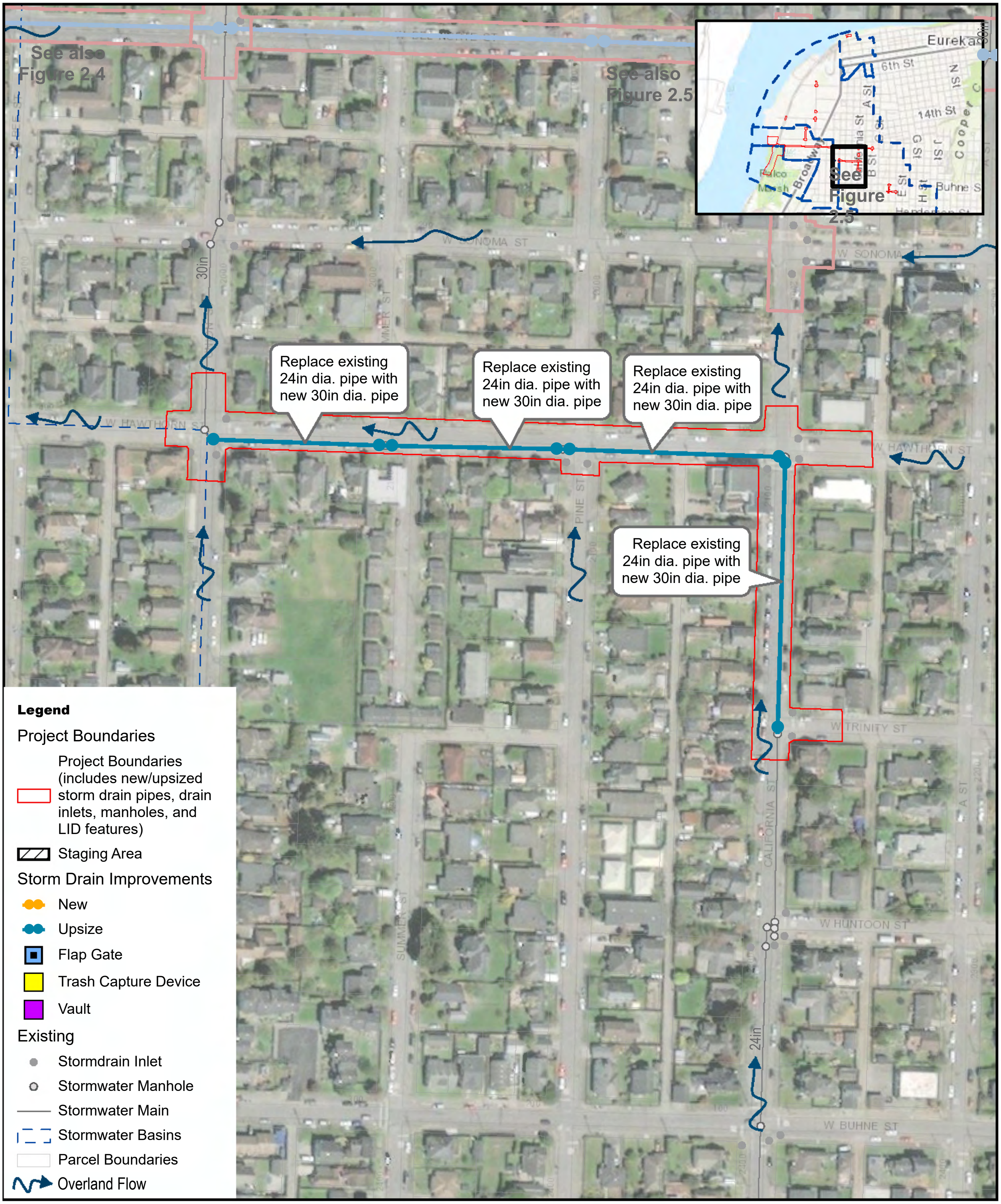

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City of Eureka
Flood Reduction and
Seal Level Rise Resiliency Project

Project Concept
Hawthorn Region

Project No. 12566459
Revision No. -
Date Jun 2022

FIGURE 2.6

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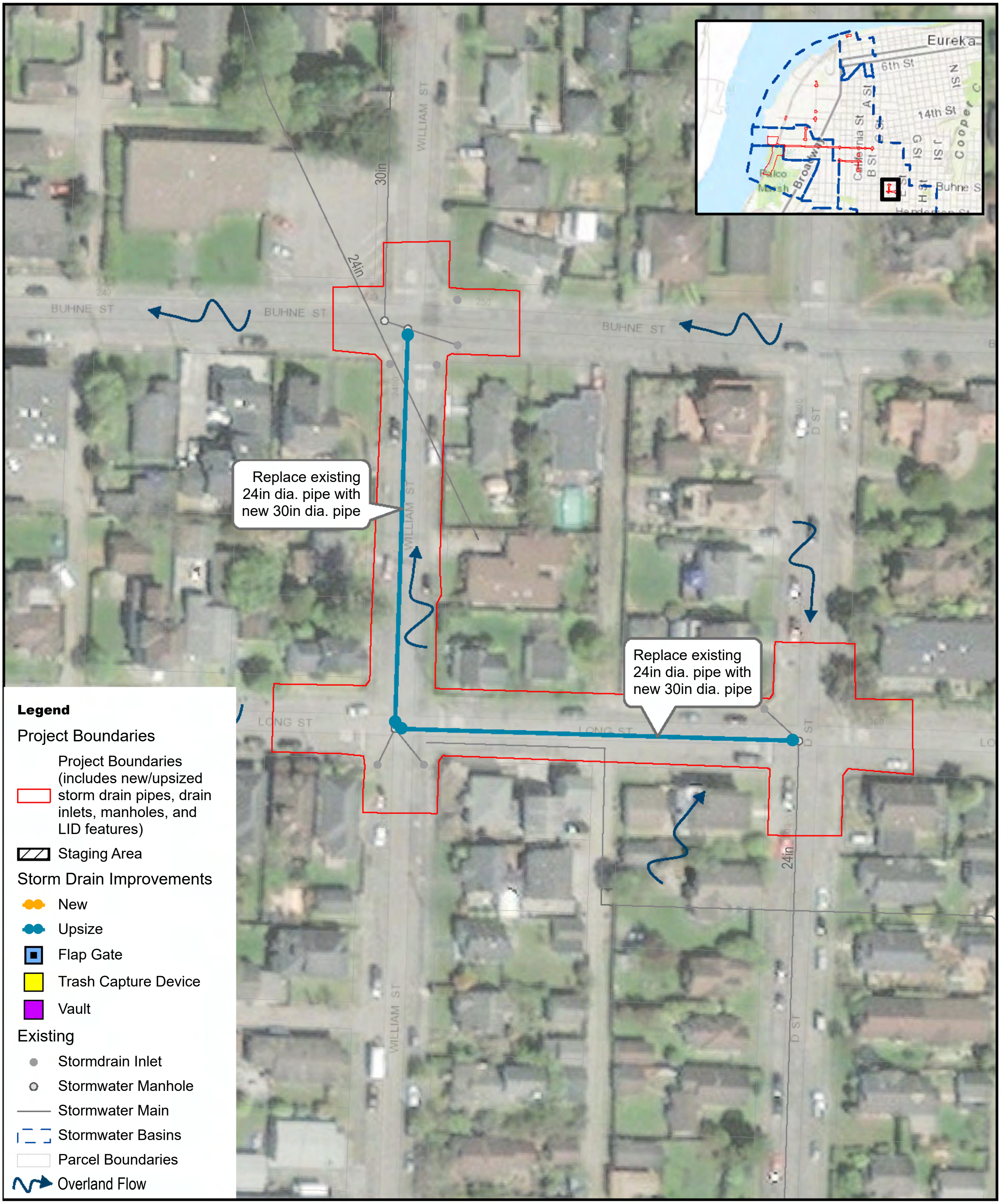

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City of Eureka
Flood Reduction and
Seal Level Rise Resiliency Project

Project Concept
Williams Region

Project No. **12566459**
Revision No. **-**
Date **Jun 2022**

FIGURE 2.7

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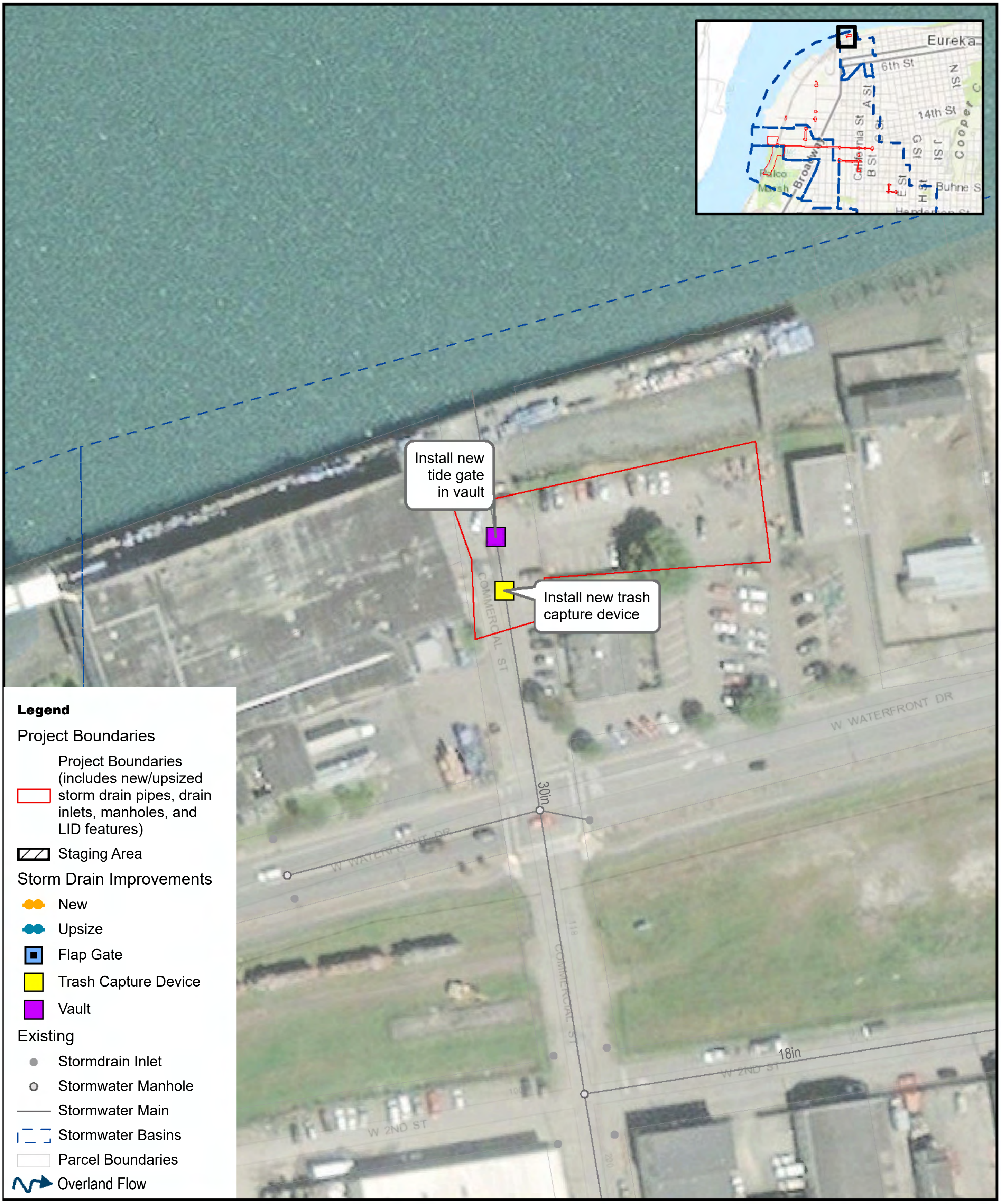

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City of Eureka
Flood Reduction and
Seal Level Rise Resiliency Project

Project Concept
Commercial Region

Project No. **12566459**
Revision No. **-**
Date **Jun 2022**

FIGURE 2.8

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City of Eureka
Flood Reduction and
Seal Level Rise Resiliency Project

Project Concept
14th Region

Project No. **12566459**
Revision No. **-**
Date **Jun 2022**

FIGURE 2.9

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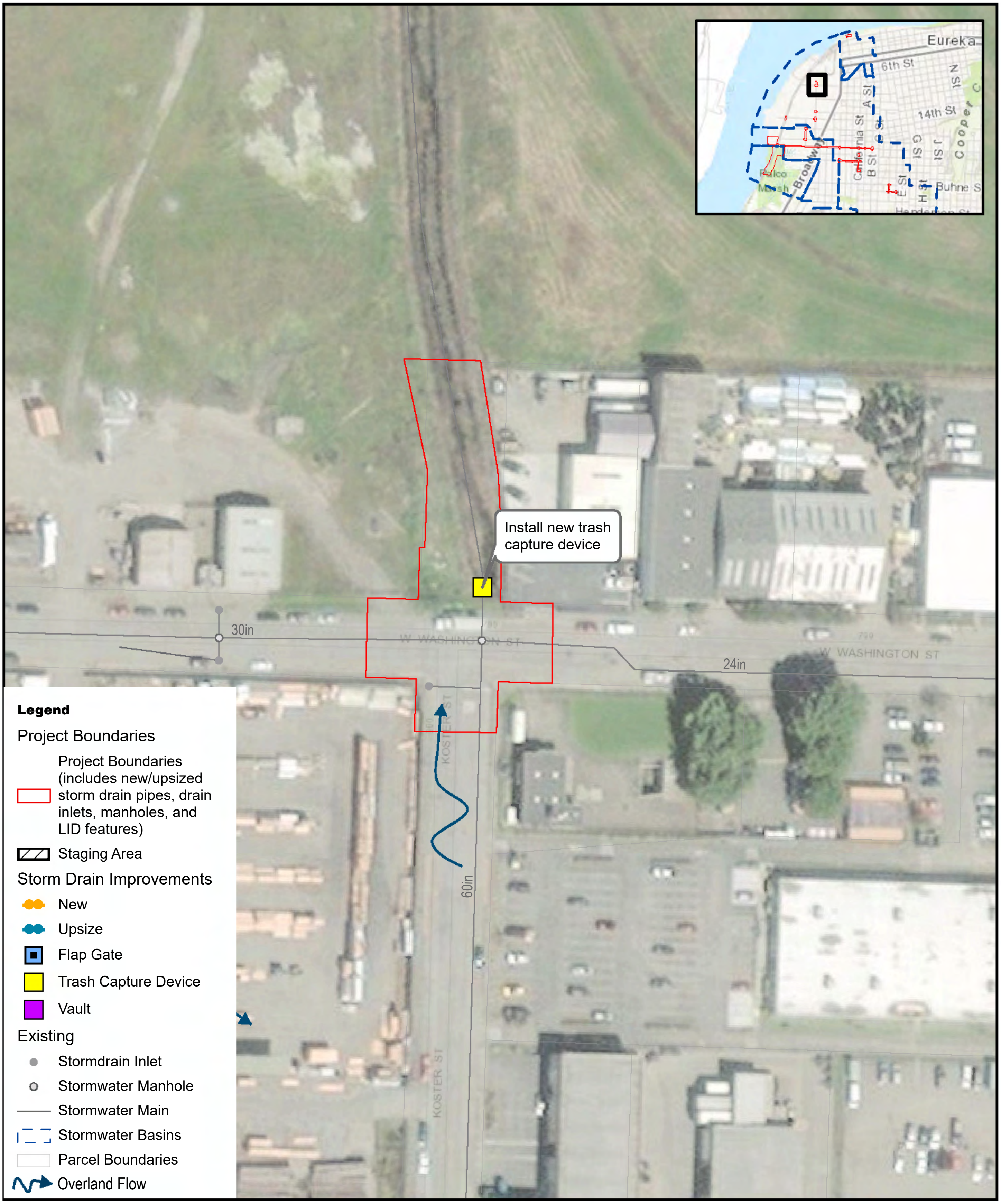

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City of Eureka
Flood Reduction and
Seal Level Rise Resiliency Project

Project Concept
Washington Region

Project No. **12566459**
Revision No. **-**
Date **Jun 2022**

FIGURE 2.10

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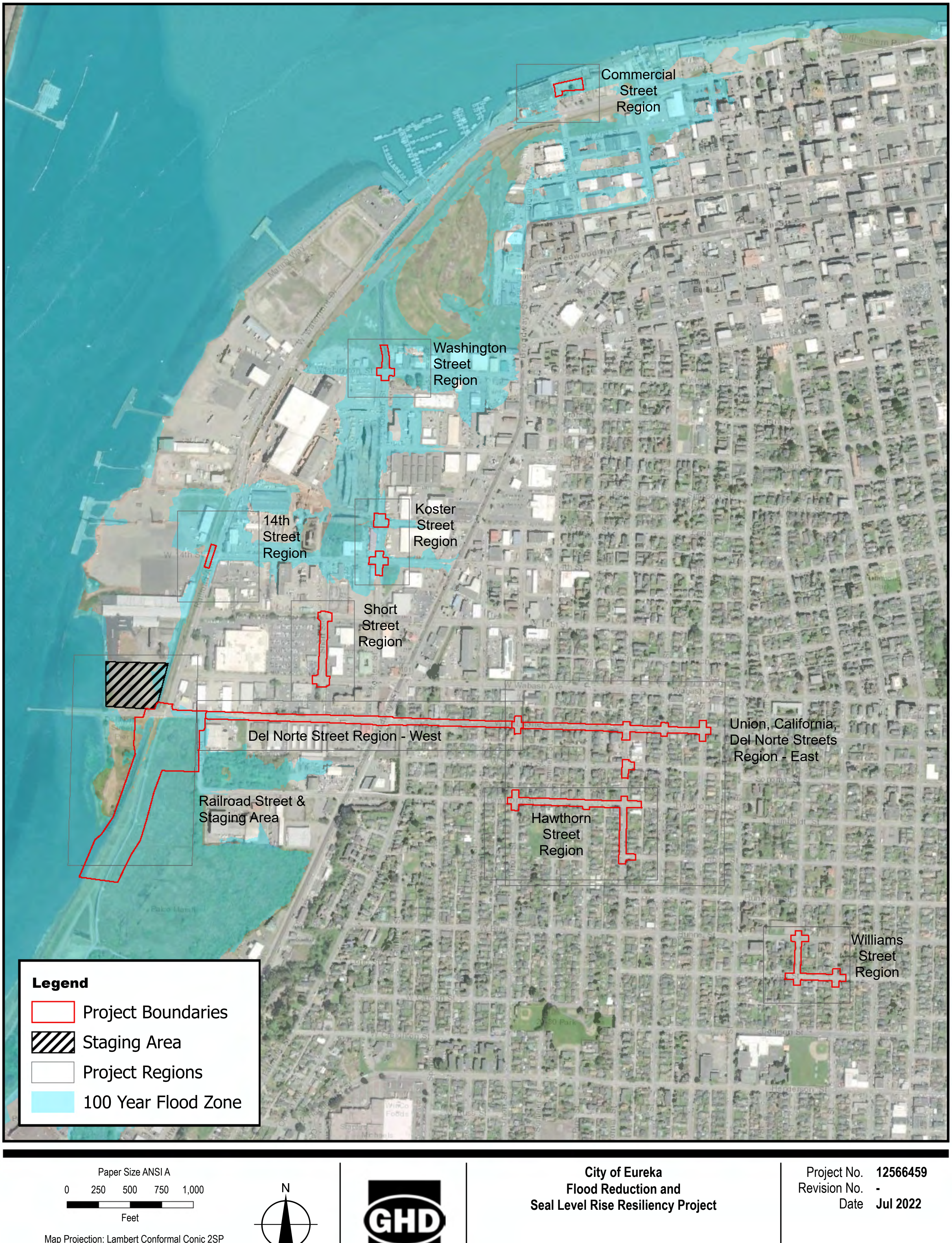

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City of Eureka
Flood Reduction and
Seal Level Rise Resiliency Project

Project No. **12566459**
Revision No. **-**
Date **Jul 2022**

FEMA 100 Year Flood Zone

FIGURE 3

N:\US\Eureka\Projects\561\12566459\GIS\Maps\Deliverables\12566459_EKA_FloodRed_SLRR_RevA.aprx - 12566459_003_EKA_SLR_Index__FEMA
Print date: 07 Jul 2022 - 09:15

Data source: World_Imagery; Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
World Topographic Map; Bureau of Land Management, Esri, HERE, Garmin, Intermap, USGS, METI/NASA, EPA, USDA. Created by: djones3

Paper Size ANSI A

0 50 100 150 200

Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

N

GHD

City of Eureka
Flood Reduction and
Seal Level Rise Mitigation Project

Botanical and Aquatic
Resources Survey Area

Project No. **12566459**
Revision No. **-**
Date **July 2022**

FIGURE 4

N:\US\Eureka\Projects\561\11220813\GIS\Maps\Deliverables\Aquatic_Resources_Delineation\11220813_Aquatic_Resources_Delineation_RevB.aprx - 11220813_12566459_004_BotanicalAquaticResourceSurveyArea
Print date: 08 Jul 2022 - 09:39

Data source: World_Transportation; Esri, HERE, GeoTechnologies, Inc., World Imagery; Maxar, Microsoft, GHD. Created by: djones3

Paper Size ANSI A

0 50 100 150 200

Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

N

GHD

City of Eureka
Flood Reduction and
Seal Level Rise Mitigation Project

Delineated Aquatic Resources

Project No. **12566459**
Revision No. **A**
Date **August 2022**

FIGURE 5.1

N:\US\Eureka\Projects\561\12566459\GIS\Maps\Deliverables\12566459_EKA_FloodRed_SLRR_RevA.aprx - 12566459_005_1_EKA_SLR_DARPMA_RevA
Print date: 09 Aug 2022 - 06:51

Data source: World Imagery; Maxar, Microsoft, GHD. Created by: djones3

Paper Size ANSI A

0 5 10 15 20 25

Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

N

GHD

City of Eureka
Flood Reduction and
Seal Level Rise Mitigation Project

Delineated Aquatic Resources

Project No. 12566459
Revision No. A
Date August 2022

FIGURE 5.2

N:\US\Eureka\Projects\561\12566459\GIS\Maps\Deliverables\12566459_EKA_FloodRed_SLRR_RevA.aprx
12566459_005_2_EKA_SLR_DARPMA_RevA
Print date: 09 Aug 2022 - 06:56

Data source: GHD, NOAA, World Imagery; Maxar, Microsoft. Created by: djones3

Appendix B

Air Quality Modeling Results

Eureka Flood Reduction adn SLR Project - Humboldt County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Eureka Flood Reduction adn SLR Project

Humboldt County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Parking	1.00	User Defined Unit	1.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	103
Climate Zone	1			**Operational Year**	2024
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Construction Only

Land Use - Land Use for Construction Emissions Analysis Only

Construction Phase - Construction Schedule from Project Engineer

Off-road Equipment - Project Specific Equipment Mix and Activity

Trips and VMT - Default Worker Trip Rates

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	21.00
tblConstructionPhase	NumDays	2.00	45.00
tblConstructionPhase	NumDays	5.00	20.00
tblConstructionPhase	NumDays	1.00	21.00
tblConstructionPhase	NumDays	2.00	20.00
tblConstructionPhase	PhaseEndDate	7/20/2022	6/29/2023
tblConstructionPhase	PhaseEndDate	7/25/2022	9/1/2023

Eureka Flood Reduction adn SLR Project - Humboldt County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblConstructionPhase	PhaseEndDate	12/19/2022	10/27/2023
tblConstructionPhase	PhaseEndDate	7/21/2022	6/29/2023
tblConstructionPhase	PhaseStartDate	7/7/2022	6/1/2023
tblConstructionPhase	PhaseStartDate	7/22/2022	7/1/2023
tblConstructionPhase	PhaseStartDate	12/13/2022	10/1/2023
tblConstructionPhase	PhaseStartDate	7/21/2022	6/1/2023
tblLandUse	LotAcreage	0.00	1.00
tblOffRoadEquipment	HorsePower	158.00	162.00
tblOffRoadEquipment	HorsePower	158.00	162.00
tblOffRoadEquipment	HorsePower	158.00	162.00
tblOffRoadEquipment	HorsePower	158.00	4.00
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.37	0.37
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.37	0.37
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.50	0.50
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.36	0.36
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType		Concrete/Industrial Saws
tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Bore/Drill Rigs
tblOffRoadEquipment	OffRoadEquipmentType		Excavators

Eureka Flood Reduction adn SLR Project - Humboldt County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType		Paving Equipment
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	8.00	2.00
tblOffRoadEquipment	UsageHours	7.00	2.00
tblOffRoadEquipment	UsageHours	1.00	3.00
tblOffRoadEquipment	UsageHours	6.00	3.00
tblOffRoadEquipment	UsageHours	6.00	3.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOffRoadEquipment	UsageHours	7.00	2.00
tblOffRoadEquipment	UsageHours	8.00	2.00
tblOffRoadEquipment	UsageHours	7.00	2.00

Eureka Flood Reduction adn SLR Project - Humboldt County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.0593	0.4957	0.7045	1.2600e-003	0.0631	0.0233	0.0864	0.0305	0.0222	0.0527	0.0000	109.8169	109.8169	0.0226	2.6000e-004	110.4596
Maximum	**0.0593**	**0.4957**	**0.7045**	**1.2600e-003**	**0.0631**	**0.0233**	**0.0864**	**0.0305**	**0.0222**	**0.0527**	**0.0000**	**109.8169**	**109.8169**	**0.0226**	**2.6000e-004**	**110.4596**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	1. Demolition	Demolition	6/1/2023	6/29/2023	5	21	
2	2. Site Preparation	Site Preparation	6/1/2023	6/29/2023	5	21	
3	3. Grading	Grading	7/1/2023	9/1/2023	5	45	
4	4. Trenching - In Road	Trenching	6/1/2023	9/27/2023	5	85	
5	5. Trenching - Laterals	Trenching	10/1/2023	10/20/2023	5	15	
6	6. Horizontal Directional Drilling	Grading	7/1/2023	7/28/2023	5	20	
7	7. Paving	Paving	10/1/2023	10/27/2023	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 8.44

Acres of Paving: 1

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating –

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Eureka Flood Reduction adn SLR Project - Humboldt County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
1. Demolition	Concrete/Industrial Saws	1	2.00	81	0.73
1. Demolition	Rubber Tired Dozers	1	3.00	247	0.40
1. Demolition	Excavators	1	6.00	158	0.38
1. Demolition	Tractors/Loaders/Backhoes	1	3.00	97	0.37
2. Site Preparation	Tractors/Loaders/Backhoes	1	2.00	97	0.37
2. Site Preparation	Excavators	1	6.00	162	0.38
2. Site Preparation	Generator Sets	1	8.00	84	0.74
3. Grading	Rubber Tired Dozers	1	3.00	247	0.40
3. Grading	Tractors/Loaders/Backhoes	1	4.00	97	0.37
3. Grading	Excavators	1	6.00	158	0.38
4. Trenching - In Road	Tractors/Loaders/Backhoes	1	4.00	97	0.37
4. Trenching - In Road	Excavators	1	6.00	162	0.38
4. Trenching - In Road	Generator Sets	1	8.00	84	0.74
4. Trenching - In Road	Concrete/Industrial Saws	1	1.00	81	0.73
5. Trenching - Laterals	Tractors/Loaders/Backhoes	1	4.00	97	0.37
5. Trenching - Laterals	Excavators	1	4.00	162	0.38
6. Horizontal Directional Drilling	Bore/Drill Rigs	1	6.00	221	0.50
6. Horizontal Directional Drilling	Excavators	1	4.00	4	0.38
6. Horizontal Directional Drilling	Generator Sets	1	8.00	84	0.74
6. Horizontal Directional Drilling	Tractors/Loaders/Backhoes	1	2.00	97	0.37
7. Paving	Rollers	1	2.00	80	0.38
7. Paving	Tractors/Loaders/Backhoes	1	2.00	97	0.37
7. Paving	Paving Equipment	1	6.00	132	0.36

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
1. Demolition	4	10.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

Eureka Flood Reduction adn SLR Project - Humboldt County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2. Site Preparation	3	8.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
3. Grading	3	8.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
4. Trenching - In Road	4	10.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
7. Paving	3	8.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
5. Trenching - Laterals	2	5.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
6. Horizontal Directional Drilling	4	10.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Eureka Flood Reduction adn SLR Project - Humboldt County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 1. Demolition - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.6500e-003	0.0531	0.0563	1.0000e-004		2.5000e-003	2.5000e-003		2.3200e-003	2.3200e-003	0.0000	9.0155	9.0155	2.5300e-003	0.0000	9.0787
Total	**5.6500e-003**	**0.0531**	**0.0563**	**1.0000e-004**		**2.5000e-003**	**2.5000e-003**		**2.3200e-003**	**2.3200e-003**	**0.0000**	**9.0155**	**9.0155**	**2.5300e-003**	**0.0000**	**9.0787**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.4000e-004	3.7000e-004	3.5000e-003	1.0000e-005	8.1000e-004	1.0000e-005	8.2000e-004	2.2000e-004	1.0000e-005	2.2000e-004	0.0000	0.6785	0.6785	3.0000e-005	3.0000e-005	0.6873
Total	**5.4000e-004**	**3.7000e-004**	**3.5000e-003**	**1.0000e-005**	**8.1000e-004**	**1.0000e-005**	**8.2000e-004**	**2.2000e-004**	**1.0000e-005**	**2.2000e-004**	**0.0000**	**0.6785**	**0.6785**	**3.0000e-005**	**3.0000e-005**	**0.6873**

3.3 2. Site Preparation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.1300e-003	0.0451	0.0707	1.2000e-004		2.1600e-003	2.1600e-003		2.0900e-003	2.0900e-003	0.0000	10.3161	10.3161	1.6800e-003	0.0000	10.3580
Total	**5.1300e-003**	**0.0451**	**0.0707**	**1.2000e-004**	**0.0000**	**2.1600e-003**	**2.1600e-003**	**0.0000**	**2.0900e-003**	**2.0900e-003**	**0.0000**	**10.3161**	**10.3161**	**1.6800e-003**	**0.0000**	**10.3580**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.4000e-004	3.0000e-004	2.8000e-003	1.0000e-005	6.5000e-004	0.0000	6.5000e-004	1.7000e-004	0.0000	1.8000e-004	0.0000	0.5428	0.5428	2.0000e-005	2.0000e-005	0.5499
Total	**4.4000e-004**	**3.0000e-004**	**2.8000e-003**	**1.0000e-005**	**6.5000e-004**	**0.0000**	**6.5000e-004**	**1.7000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**0.5428**	**0.5428**	**2.0000e-005**	**2.0000e-005**	**0.5499**

Eureka Flood Reduction adn SLR Project - Humboldt County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 3. Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0553	0.0000	0.0553	0.0284	0.0000	0.0284	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0107	0.1037	0.1066	1.9000e-004		4.8500e-003	4.8500e-003		4.4600e-003	4.4600e-003	0.0000	17.1023	17.1023	5.5300e-003	0.0000	17.2406
Total	**0.0107**	**0.1037**	**0.1066**	**1.9000e-004**	**0.0553**	**4.8500e-003**	**0.0601**	**0.0284**	**4.4600e-003**	**0.0329**	**0.0000**	**17.1023**	**17.1023**	**5.5300e-003**	**0.0000**	**17.2406**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.3000e-004	6.3000e-004	6.0000e-003	1.0000e-005	1.3900e-003	1.0000e-005	1.4000e-003	3.7000e-004	1.0000e-005	3.8000e-004	0.0000	1.1631	1.1631	5.0000e-005	5.0000e-005	1.1783
Total	**9.3000e-004**	**6.3000e-004**	**6.0000e-003**	**1.0000e-005**	**1.3900e-003**	**1.0000e-005**	**1.4000e-003**	**3.7000e-004**	**1.0000e-005**	**3.8000e-004**	**0.0000**	**1.1631**	**1.1631**	**5.0000e-005**	**5.0000e-005**	**1.1783**

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Eureka Flood Reduction adn SLR Project - Humboldt County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 4. Trenching - In Road - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0242	0.2125	0.3296	5.5000e-004		0.0102	0.0102		9.9000e-003	9.9000e-003	0.0000	47.5693	47.5693	7.8900e-003	0.0000	47.7665
Total	**0.0242**	**0.2125**	**0.3296**	**5.5000e-004**		**0.0102**	**0.0102**		**9.9000e-003**	**9.9000e-003**	**0.0000**	**47.5693**	**47.5693**	**7.8900e-003**	**0.0000**	**47.7665**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2000e-003	1.5000e-003	0.0142	3.0000e-005	3.2800e-003	2.0000e-005	3.3000e-003	8.7000e-004	2.0000e-005	8.9000e-004	0.0000	2.7461	2.7461	1.3000e-004	1.1000e-004	2.7821
Total	**2.2000e-003**	**1.5000e-003**	**0.0142**	**3.0000e-005**	**3.2800e-003**	**2.0000e-005**	**3.3000e-003**	**8.7000e-004**	**2.0000e-005**	**8.9000e-004**	**0.0000**	**2.7461**	**2.7461**	**1.3000e-004**	**1.1000e-004**	**2.7821**

Eureka Flood Reduction adn SLR Project - Humboldt County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 5. Trenching - Laterals - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.2900e-003	0.0117	0.0209	3.0000e-005		5.8000e-004	5.8000e-004		5.3000e-004	5.3000e-004	0.0000	2.7749	2.7749	9.0000e-004	0.0000	2.7974
Total	**1.2900e-003**	**0.0117**	**0.0209**	**3.0000e-005**		**5.8000e-004**	**5.8000e-004**		**5.3000e-004**	**5.3000e-004**	**0.0000**	**2.7749**	**2.7749**	**9.0000e-004**	**0.0000**	**2.7974**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9000e-004	1.3000e-004	1.2500e-003	0.0000	2.9000e-004	0.0000	2.9000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2423	0.2423	1.0000e-005	1.0000e-005	0.2455
Total	**1.9000e-004**	**1.3000e-004**	**1.2500e-003**	**0.0000**	**2.9000e-004**	**0.0000**	**2.9000e-004**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**0.0000**	**0.2423**	**0.2423**	**1.0000e-005**	**1.0000e-005**	**0.2455**

Eureka Flood Reduction adn SLR Project - Humboldt County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.7 6. Horizontal Directional Drilling - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.0600e-003	0.0464	0.0576	1.4000e-004		1.9700e-003	1.9700e-003		1.9100e-003	1.9100e-003	0.0000	12.5955	12.5955	2.4900e-003	0.0000	12.6578
Total	**5.0600e-003**	**0.0464**	**0.0576**	**1.4000e-004**	**0.0000**	**1.9700e-003**	**1.9700e-003**	**0.0000**	**1.9100e-003**	**1.9100e-003**	**0.0000**	**12.5955**	**12.5955**	**2.4900e-003**	**0.0000**	**12.6578**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2000e-004	3.5000e-004	3.3300e-003	1.0000e-005	7.7000e-004	1.0000e-005	7.8000e-004	2.1000e-004	0.0000	2.1000e-004	0.0000	0.6461	0.6461	3.0000e-005	3.0000e-005	0.6546
Total	**5.2000e-004**	**3.5000e-004**	**3.3300e-003**	**1.0000e-005**	**7.7000e-004**	**1.0000e-005**	**7.8000e-004**	**2.1000e-004**	**0.0000**	**2.1000e-004**	**0.0000**	**0.6461**	**0.6461**	**3.0000e-005**	**3.0000e-005**	**0.6546**

Eureka Flood Reduction adn SLR Project - Humboldt County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.8 7. Paving - 2023

Unmitigated Construction On-Site

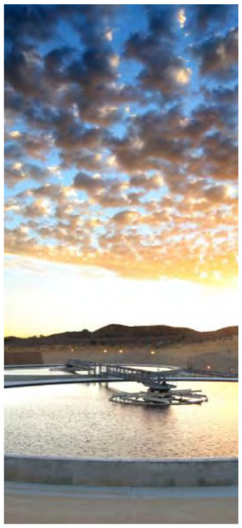
	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.0300e-003	0.0197	0.0291	4.0000e-005		9.9000e-004	9.9000e-004		9.1000e-004	9.1000e-004	0.0000	3.9077	3.9077	1.2600e-003	0.0000	3.9392
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.0300e-003**	**0.0197**	**0.0291**	**4.0000e-005**		**9.9000e-004**	**9.9000e-004**		**9.1000e-004**	**9.1000e-004**	**0.0000**	**3.9077**	**3.9077**	**1.2600e-003**	**0.0000**	**3.9392**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.2000e-004	2.8000e-004	2.6700e-003	1.0000e-005	6.2000e-004	0.0000	6.2000e-004	1.6000e-004	0.0000	1.7000e-004	0.0000	0.5169	0.5169	2.0000e-005	2.0000e-005	0.5237
Total	**4.2000e-004**	**2.8000e-004**	**2.6700e-003**	**1.0000e-005**	**6.2000e-004**	**0.0000**	**6.2000e-004**	**1.6000e-004**	**0.0000**	**1.7000e-004**	**0.0000**	**0.5169**	**0.5169**	**2.0000e-005**	**2.0000e-005**	**0.5237**

Appendix C

Biological Resources Evaluation





Biological Resources Evaluation

Eureka Flood Reduction and Sea Level Rise Resiliency Project

Prepared for the City of Eureka

GHD | 718 Third Street, Eureka, California, 95501 USA

11220813 | Report No 1 | July 13, 2022

Table of Contents

Table Index

Appendix Index

List of Acronyms

BARSA	Botanical and Aquatic Resources Survey Area
BRE	Biological Resources Evaluation
Cal OES	California Governor's Office of Emergency Services
CCR	California Code of Regulations
CCC	California Coastal Commission
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRPR	California Rare Plant Ranking
CWA	Clean Water Act
DPS	Distinct Population Segment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
ESA	Endangered Species Act
ESHA	Environmentally Sensitive Habitat Area
ESU	Evolutionarily Significant Unit
F	Fahrenheit
FEMA	Federal Emergency Management Agency
FGC	Fish and Game Code
FMP	Fishery Management Plant
FP	Fully Protected
HAPC	Habitat Areas of Particular Concern
HCP	Habitat Conservation Plan
HMG	Hazard Mitigation Grant
ITP	Incidental Take Permit
LCP	Local Coastal Program
LF	linear feet
LID	Low Impact Drain
LSAA	Lake and Streambed Alteration Agreement
MBPA	Migratory Bird Protection Act
MBTA	Migratory Bird Treaty Act
MHHW	mean higher high water
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
NCCP	Natural Community Conservation Planning
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPPA	Native Plant Protection Act
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
PBF	Physical and Biological Features

PCE	Primary Constituent Elements
PFMC	Pacific Fisheries Management Council
PSB	Project Study Boundary
RWQCB	Regional Water Quality Control Board
SAL	Special Animals List
SC	State Candidate
SE	State Endangered
SFA	Sustainable Fisheries Act
SNC	Sensitive Natural Communities
SR	State Rare
SSC	Species of Special Concern
ST	State Threatened
USACE	U.S. Army Corps of Engineers
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

1. Executive Summary

The purpose of this Biological Resources Evaluation (BRE) is to investigate and determine which sensitive biological resources (if any), including plant and wildlife species and sensitive habitats, may occur in the footprint or vicinity of the City of Eureka Flood Reduction and Sea Level Rise Mitigation Project (hereafter "Project," described below) and address any potential effects of the Project on these sensitive biological resources. The BRE is also designed to provide supporting biological information for the Project's California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) processes. The Project proponent, the City of Eureka ("City"), has received funding from the Federal Emergency Management Agency (FEMA) through a Hazard Mitigation Grant (HMP) administered by the California Governor's Office of Emergency Services (Cal OES) for this Project. This requires any environmental review to meet NEPA requirements.

Based on the GHD site visits and surveys on May 11, 24 and 27, 2021, July 8, and July 26, 2021, and May 18, 2022, as well as a thorough database and literature search, the Project occurs within the range of several federally listed and state special status wildlife and plant species, as well as a sensitive natural community (SNC) and aquatic resources. This submittal represents an initial analysis, to determine whether consultation is required with the U.S. Fish and Wildlife Service (USFWS) and/or the National Marine Fisheries Service (NMFS) under Section 7 of the Endangered Species Act (ESA) (16 U.S.C. §§ 1536) for the proposed Project and to support NEPA. This report also addresses impacts to state special status species and habitats to inform the Project's CEQA document.

Fisheries sampling within Palco Marsh and Clark Slough, including field seine netting and laboratory eDNA methods indicate the absence of federally- and/or state-listed species including: Coho Salmon, Chinook Salmon, Steelhead (collectively known as "salmonids"), and Tidewater Goby (RTA and Cal Poly Humboldt 2022). Temporary dewatering within Palco Marsh (a tidal channel), and potentially within Clark Slough (an intermittent freshwater-dominant waterway located 0.25 mile upstream of a leaking tide gate) would occur. Dewatering within Palco Marsh would occur in tandem with the low tide, i.e. the construction work area would be isolated during low tide which may preclude or significantly reduce the need to use pumps or other methods of dewatering except to dewater small, shallow, isolated areas. Aquatic species would be relocated from the small, shallow, isolated areas of remaining water following dewatering, and into suitable habitat (within Humboldt Bay). Following dewatering, it is unlikely that federally and/or state listed aquatic species would occur within the remaining isolated pools of Palco Marsh, and thus need to be relocated, due to the eDNA results (absence) and daily extreme low tides which only leave isolated pools of available habitat. It is unlikely that federally and/or state listed aquatic species would occur within Clark Slough because the existing tide gate blocks upstream access to fish.

Based on Project-specific studies which have showed an absence of federally listed species, and the analysis herein, it is unlikely that federally listed Coho Salmon, Chinook Salmon or Steelhead would need to be relocated during temporary dewatering of the tidal channel within the Action Area (defined in Section 2.7). However, it is possible that a small number of these species may be present and thus need to be relocated. Therefore, the Project may affect but is not likely to adversely affect federally listed Coho Salmon, Chinook Salmon, and Steelhead (i.e., relocation of fish may be required during dewatering). Formal consultation is not expected with NMFS or USFWS. The Project will have no effect on federally designated critical or essential fish habitat.

Longfin Smelt (an ESA candidate species, and California Endangered Species Act [CESA] listed species) was not considered during eDNA analysis however this species was not observed during seining and fisheries monitoring. The closest record of this species to the Action Area was in Humboldt Bay in 2005. Fisheries monitoring and eDNA analysis did not detect summer run steelhead, a CESA listed species, within Palco Marsh or Clark Slough. Similarly to above, it is unlikely that these species would occur within Palco Marsh or Clark Slough, and that relocation of these species during dewatering would occur. However, if these species were encountered during dewatering CESA coverage via an Incidental Take Permit (ITP) or other method from the California Department of Fish and Wildlife (CDFW), such as a letter of concurrence, would be required.

Take of federally and state listed species would be avoided or minimized through implementation of measures described in Section 8 and additional measures that may be developed in future consultation and permitting documents.

Potential Project impacts on other protected biological resources including aquatic resources, SNCs, rare plants, and state special status species (Species of Special Concern [SSC], Fully Protected [FP], and those on the Special Animals List [SAL]) are expected to be less than significant with mitigation incorporated.

2. Project Description

2.1 Proposed Project

The City of Eureka proposes the Eureka Flood Reduction and Sea Level Rise Resiliency Project (Project) within urbanized coastal areas to reduce flooding, increase sea level rise resiliency, and improve water quality in Humboldt Bay. The Project would increase the storage capacity and conveyance of the storm drain network, implement flow attenuation and water quality improvements, reduce trash conveyance into waterways, and enhance tidal circulation to provide flood reduction and sea level rise resiliency. Increased storage capacity and conveyance would be achieved by replacing undersized storm drain pipes with larger diameter pipes, installation of tide gates at strategic locations within the system, and construction of a new storm drain pipe alignment. Flow attenuation and water quality improvements would be accomplished with Low Impact Development (LID) features (e.g., rain gardens) and trash capture devices. Rain gardens would be placed along or upstream of storm drain improvements, and trash capture devices would be installed in key locations along the storm drain alignments. Water quality benefits would be achieved by reducing peak flows and runoff volumes that can cause erosion and carry sediment to Humboldt Bay. The LID features would provide additional pollutant removal from urban runoff via the increased holding time, contact with vegetation, and percolation of runoff into soil. The trash capture devices (TCDs) would also reduce pollutants entering Humboldt Bay and assist the City in meeting their MS4 requirements. Enhancements to the existing muted tidal system at Palco Marsh include channel excavation and replacement of the existing hydraulic conveyance structure between the marsh and Humboldt Bay with larger capacity culverts and adjustable flap gates. The new culverts would increase the lower tidal range, match existing tidal inundation duration, store peak water levels within the marsh area and avoid offsite flooding, enhance sediment exchange from the Bay to Palco Marsh, reduce velocities within the crossing, and enhance sediment deposition on the marsh plain to promote adaptation of the marsh ecosystem to rising sea levels.

The main components of this Project are to:

- Replacement of approximately 3,200 lineal feet of existing storm drain pipe with larger capacity pipes ranging from 18 to 36-inches in diameter
- Installation of approximately 3,700 lineal feet of new storm drain pipe ranging from 36 to 60-inch diameter and boxes ranging from 8-foot by 3 to 4-foot
- New storm drain manholes and junction boxes
- Install up to 10 low impact development features
- Install four tide gates to control tidal flow direction
- Rehabilitate two existing storm drain outfalls
- Install four trash capture devices upstream of the storm water system's outfalls that drain to Humboldt Bay.
- Excavation of approximately 700 feet of new channel located in the northern extent of Palco Marsh and deepening and enhancements to an additional 850 feet of existing channel that the new channel will flow into.

2.2 Project Location

The Project is located in Eureka, Humboldt County, California. Various Project components occur throughout the city, but the Project is generally bordered to the east by E Street, to the south at Henderson Street, and to the north and west by Humboldt Bay (see Appendix A, Figure 1). The northern-most point of proposed construction is located at the northern terminus of Commercial Street (40°48'17.0"N, 124°10'28.0"W) and the southern-most point of construction is located near at the intersection of Dollison and D Street (40°47'02.5"N, 124°09'56.7"W). The Project's staging area is proposed just north of the Del Norte Street Pier. Specifically, the majority of Project components are located within various street segments and intersections throughout the City by Project region as described below.

Stormwater Pipe Replacement

- Del Norte Street (St.) between B St. and the Eureka Waterfront Trail;
- Short St. between 15th St. and Wabash Ave.;
- Koster St. between Washington St. and 4th St.;
- Hawthorne St. between Union St. and California St.;
- California St. between Hawthorne St. and Trinity St.;
- Williams St. between Long St. and Buhne St.;
- Long St. between Williams St. and D St.;

Low Impact Development Installation

- Del Norte St. and California St.;
- Sonoma St. and California St.

Trash Capture Device Installation

- Washington and Koster St.;
- 14th St. and Eureka Waterfront Trail

Tide Gate Installation

- Koster St. and Cedar St.
- Commercial St. and Waterfront Dr. (replacement of existing tide gate)
- Del Norte St. at Palco Marsh
- Palco Marsh at Humboldt Bay (Adjustable to maintain existing tidal exchange)

Improvements to Palco Marsh would occur in Palco Marsh located south of the western extent of Del Norte Street. The Project Area is bordered by residential, industrial, and open space uses.

2.3 Construction Staging and Equipment

Prior to and during construction, the contractor would mobilize resources to a staging area that would be located just north of the Del Norte Street Pier and west of Railroad Avenue in Eureka. The proposed staging area is a paved, vacant lot (contiguous with an industrial storage area to the north) with no natural habitat present (see Appendix A, Figure 1). A variety of construction equipment would be used to build the Project, including various excavators, loaders, backhoe, worker trucks, dump truck, water truck, rollers, and pavers.

2.4 Construction Schedule

Construction dates are currently unknown, as the City is in the process of applying for grant funding for the Project, and construction will be contingent on funding approval. It is anticipated that construction would occur within five years. Construction within Palco Marsh, Clark Slough and in Project areas adjacent to aquatic resources would occur during the dry season (June 15 through October 15) to limit potential water quality impacts.

2.5 Other Public Agencies Whose Approval May be Required

Federal, State, and local approvals that may be required for the Project are listed below.

- U.S. Army Corps of Engineers Clean Water Act Section 404 Permit and associated ESA Section 7 Consultation with the NMFS and USFWS
- North Coast Regional Water Quality Control Board: Section 401 Water Quality Certification
- California Department of Fish and Wildlife: Section 1602 Notification of Lake or Streambed Alteration

- California Coastal Commission Coastal Development Permit Amendment (Permit # 1-90-104)
- City of Eureka Coastal Development Permit
- City of Eureka Use Permit
- City of Eureka Grading Permit

2.6 Definition of the Project Area

The Project Area encompasses the construction areas, staging areas, and access roads (see Appendix A, Figure 1). The Project Area is synonymous with all areas of proposed ground disturbance for the Project.

2.7 Definition of the Federal Endangered Species Act (ESA) Action Area

The Action Area serves as the "study area" for the purposes of a Section 7 Biological Assessment. The Action Area includes the Project Area, as defined in Section 2.6, buffered by an area of 50 feet. Federally listed species were evaluated at the level of the Action Area in this BRE. This large buffer around the Project Area is designed to account for any construction-related auditory and visual disturbance to wildlife in the vicinity, vegetation clearing, and other potential impacts such as increased dust or sediment releases. The Project is within a developed residential/industrial/commercial landscape with construction impacts largely confined to existing developed or disturbed areas (with the exception of impacts at Palco Marsh and in the adjacent tidal channel). The Action Area is shown in Appendix A, Figure 3.

2.8 Definition of the Project Study Boundary

For the purposes of this BRE, the Project Study Boundary (PSB) includes the Project Area as defined in Section 2.6, buffered by an area of 50 feet. The extent of the PSB is the same as that of the Action Area. Different terminology referencing the same study area extent is related to regulatory requirements (i.e., "Action Area" is the study area terminology for the purpose of an ESA analysis/NEPA, and "PSB" is the study area terminology for a non-ESA analysis). State special status wildlife species with no federal status were evaluated at the level of the PSB. The PSB is shown in Appendix A, Figure 3.

2.9 Definition of the Botanical and Aquatic Resources Survey Area

The Botanical and Aquatic Resources Survey Area (BARSA) is a smaller survey extent within the Project Area (defined in Section 2.6), that represents the area in which protocol-level rare plants surveys, SNC survey, and an aquatic resource delineation were conducted (see Appendix A, Figure 2). These surveys were not conducted throughout the entire Project Area, as much of it is hardscape/non-habitat.

3. Regulatory Background

The following is an overview of agencies that have potential oversight of the proposed Project related to biological resources. The regulatory setting is divided into sections on federal, state, and local jurisdiction.

3.1 Federal Jurisdiction

3.1.1 National Environmental Policy Act

The National Environmental Policy Act of 1969 requires federal agencies to prepare environmental documentation that discloses to decision-makers and the interested public a clear, accurate description of potential environmental effects resulting from proposed federal actions and reasonable alternatives to those actions. Through NEPA, the U.S. Congress directed federal agencies to integrate environmental factors in their planning and decision-making processes and encourage and facilitate public involvement in decisions that affect the quality of the human environment. Federal agencies are required to consider the environmental effects of a Proposed Action, alternatives to the Proposed Action, and a No Action alternative (assessing the potential environmental effects of not undertaking the Proposed Action).

3.1.2 Endangered Species Act

The ESA of 1973 (16 United States Code [USC] 1531 et seq.) establishes a national policy that all federal departments and agencies provide for the conservation of threatened and endangered species and their ecosystems. The Secretary of the Interior and the Secretary of Commerce are designated in the ESA as responsible for: (1) maintaining a list of species likely to become endangered within the foreseeable future throughout all or a significant portion of its range (threatened) and that are currently in danger of extinction throughout all or a significant portion of its range (endangered); (2) carrying out programs for the conservation of these species; and (3) rendering opinions regarding the impact of proposed federal actions on listed species. The ESA also outlines what constitutes unlawful taking, importation, sale, and possession of listed species and specifies civil and criminal penalties for unlawful activities.

Pursuant to the requirements of the ESA, an agency reviewing a proposed project within its jurisdiction must determine whether any federally listed or proposed species may be present in the project region, and whether the proposed project would result in a “take” of such species. The ESA prohibits “take” of a single threatened and endangered species except under certain circumstances and only with authorization from the USFWS or the National Oceanic and Atmospheric Administration (NOAA) Fisheries through a permit under Section 7 (for federal entities or federal actions) or 10(a) (for non-federal entities) of the Act. “Take” under the ESA includes activities such as “harass, harm, pursue, hunt shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” USFWS regulations define harm to include “significant habitat modification or degradation.” On June 29, 1995, a U.S. Supreme Court ruling further defined harm to include habitat modification “…where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering.”

In addition, the agency is required to determine whether the project is likely to jeopardize the continued existence of any species proposed to be listed under the ESA or result in the destruction or adverse modification of critical habitat for such species (16 USC 1536[3][4]). If it is determined that a project may result in the "take" of a federally listed species, consultation would be required under Section 7 or Section 10 of the ESA.

Critical habitat is defined by the ESA as a specific geographic area containing features essential for the conservation of an endangered or threatened species. Under Section 7 of the ESA, critical habitat should be evaluated if designated for federally listed species that may be present in the project Action Area (federally designated term for a “Project Study Boundary”).

Habitat Conservation Plans (HCPs)

Conservation plans were incorporated into the ESA in 1982 (sections 10(a)(1)(B) and 10(a)(2)(A) of the ESA, as amended) to create a pathway for take exemptions under the Act for federal and non-federal entities (previously prohibited under Section 9 of the Act). HCPs are planning documents that provide measures to minimize or mitigate project impacts to listed or candidate species (as well as eagles, following 2011 guidance) at an ecosystem versus single-species level. An HCP provides a degree of assurance for private entities that measures agreed upon in the HCP by federal regulators and the entity would be upheld and not altered for the lifespan of the document, and no additional obligations (financial, land use, or other) would be required at a later date with respect to the species covered in the HCP (referred to as the “No Surprises Rule”; 63 FR 8859). Requirements for issuance of an HCP require that all take is incidental, take would be minimized and mitigated to the maximum extent practical, adequate funds are available to implement the plan, and the incidental take would not appreciably reduce the survival and recovery potential of the species, among others. HCPs are also must comply with the Five Point Policy (65 FR 35242) that requires the incorporation of biological goals and objectives for each species in the document, adaptive management, monitoring, a set time frame for implementation, and public participation through the NEPA process.

Habitat Conservation Plans That Overlap the Project

The Project Area, PSB, and Action Area do not overlap any existing active or proposed HCPs according to a current list from the USFW ECOS website (USFWS 2021a), and the CDFW list of HCPs and Natural Community Conservation Planning (NCCP)s (CDFW 2021c).

3.1.3 Executive Order 13112, Invasive Species

Executive Order 13112 was issued in 1999 to enhance federal coordination and response to the complex and accelerating problem of invasive species. It provides policy direction to promote coordinated efforts of federal, state, and local agencies in monitoring, detecting, preventing, evaluating, managing, and controlling the spread of invasive species and increasing the effectiveness of scientific research and public outreach affecting the spread and impacts of invasive species.

3.1.4 Migratory Bird Treaty Act (MBTA)

The MBTA of 1918 (16 USC 703-712) as amended established federal responsibilities for the protection of nearly all species of birds, their eggs, and nests. A migratory bird is defined as any species or family of birds that live, reproduce, or migrate within or across international borders at some point during their annual life cycle. The MBTA prohibits the take, possession, buying, selling, purchasing, or bartering of any migratory bird listed in 50 CFR Part 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). Only exotic species such as Rock Pigeons (*Columba livia*), House Sparrows (*Passer domesticus*), and European Starlings (*Sturnus vulgaris*) are exempt from protection.

3.1.5 Clean Water Act (CWA)

The CWA (1977, as amended) establishes the basic structure for regulating discharges of pollutants into waters of the U.S. It gives the U.S. Environmental Protection Agency (EPA) the authority to implement pollution control programs, including setting wastewater standards for industry and water quality standards for contaminants in surface waters. The CWA makes it unlawful for any person to discharge any pollutant from a point source into navigable waters, without a permit under its provisions.

Discharge of fill material into "waters of the U.S.," including wetlands, is regulated by the U.S. Army Corps of Engineers (USACE) under Section 404 of the CWA (33 USC 1251-1376). USACE regulations implementing Section 404 define "waters of the U.S." to include intrastate waters (such as, lakes, rivers, streams, wetlands, and natural ponds) that the use, degradation, or destruction of could affect interstate or foreign commerce. Wetlands are defined for regulatory purposes as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3; 40 CFR 230.3). The placement of structures in "navigable waters of the U.S." is also regulated by the USACE under Section 10 of the Federal Rivers and Harbors Act (33 USC 401 et seq.). Projects are approved by USACE under standard (i.e., individual) or general (i.e., nationwide, programmatic, or regional) permits. The type of permit is determined by the USACE and based on project parameters.

The Fish and Wildlife Coordination Act requires consultation with the USFWS, NOAA Fisheries, and responsible state wildlife agency for any federally authorized action to control or modify surface waters. Therefore, any project proposed or permitted by the USACE under the CWA Section 404 must also be reviewed by the federal wildlife agencies and CDFW.

Section 401 of the CWA requires any applicant for a federal license or permit, which involves an activity that may result in a discharge of a pollutant into waters of the U.S., obtain a certification that the discharge will comply with applicable effluent limitations and water quality standards. CWA 401 certifications are issued by Regional Water Quality Control Boards (RWQCBs) under the California Environmental Protection Agency.

3.1.6 Executive Order 11990

Executive Order 11990 (1977) furthers the protection of wetlands under NEPA through avoidance of long and short-term adverse impacts associated with the destruction or modification of wetlands where practicable. The order requires all federal agencies managing federal lands, sponsoring federal projects, or funding state or local projects to assess the effects of their actions on wetlands. The agencies are required to follow avoidance, mitigation, and preservation procedures. The Presidential Wetland Policy of 1993 and subsequent reaffirmation of the policy in 1995 supports effective protection and restoration of wetlands, while advocating for increased fairness of federal regulatory programs.

3.1.7 Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) of 1976 (as amended)

The Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) (16 U.S.C. 1801 et seq.) provides the federal government with the authority to manage fisheries in the U.S. Exclusive Economic Zone (EEZ) (from state waters which end three nautical miles offshore to a distance of 200 nautical miles). In addition, the Act mandates inter-agency cooperation in achieving protection, conservation, and enhancement of Essential Fish Habitat (EFH). The Act defines EFH as "Those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. For the purpose of interpreting the definition of EFH: 'waters' include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; 'substrate' includes sediment, hard bottom, structures underlying the waters, and associated biological communities; 'necessary' means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and “spawning, breeding, feeding, or growth to maturity” covers a species' full life cycle" (50 CFR 600.10).

EFH guidelines also address Habitat Areas of Particular Concern (HAPCs) that should be evaluated within EFH. HAPCs may include both designated areas and designated habitat types. HAPCs are designated by the Fishery Management Council based on:

- “The importance of the ecological function provided by the habitat;
- The extent to which the habitat is sensitive to human-induced environmental degradation;
- Whether, and to what extent, development activities are or would be stressing the habitat type; and
- The rarity of the habitat type” (50 CFR 600.815(a)(8)).

EFH designations serve to highlight the importance of habitat conservation for sustainable fisheries and sustaining valuable fish populations. EFH relates directly to the physical fish habitat and indirectly to factors that contribute to degradation of this habitat. Important features of EFH that deserve attention are adequate water quality, temperature, food source, water depth, and cover/vegetation. Adverse effects to EFH are considered to be “any impact that reduces quality and/or quantity of EFH. Adverse effects may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality and/or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions” (50 CFR 600.10). Federal agencies are required to consult with NMFS regarding any actions (may include funding, permitting, or activities) that may adversely impact EFH.

3.1.8 Sustainable Fisheries Act of 1996

The Sustainable Fisheries Act (SFA) (Public Law 104-107) serves as an amendment to the MSFCMA to “authorize appropriations, to provide for sustainable fisheries, and for other purposes”. The SFA includes requirements for describing EFH in Fishery Management Plans (FMP) and also mandates the protection EFH. According to the SFA, “[o]ne of the greatest long-term threats to the viability of commercial and recreational fisheries is the continuing loss of marine, estuarine, and other aquatic habitats. Habitat considerations should receive increased attention for the conservation and management of fishery resources of the United States.” This act also mandates the delineation of EFH for all managed species.

3.2 State Jurisdiction

3.2.1 California Environmental Quality Act (CEQA)

CEQA applies to certain activities of state and local public agencies. A public agency must comply with CEQA when it undertakes an activity defined by CEQA as a "project." A project is an activity undertaken by a public agency or a private activity which must receive some discretionary approval. Under CEQA, a variety of technical studies including biological, cultural, traffic, and air quality studies as well as research and professional knowledge are considered to determine whether the project may have an “adverse effect” on the environment. Lead agencies are charged with evaluating the best available data when determining what specifically should be considered an “adverse effect” to the environment.

3.2.2 Porter-Cologne Water Quality Act

The Porter-Cologne Act provides for statewide coordination of water quality regulations by establishing the California State Water Resources Control Board. The State Board is the statewide authority that oversees nine separate RWQCBs that collectively oversee water quality at regional and local levels. California RWQCBs issue CWA Section 401 Water Quality Certifications for possible pollutant discharges into waters of the U.S. or state. On April 2, 2019 the California State Water Resources Control Board adopted new definitions and procedures for discharges of dredged or fill material to Waters of the State.

3.2.3 California Endangered Species Act

The CESA includes provisions for the protection and management of species listed by the State of California as endangered, threatened, or designated as candidates for such listing (California Fish and Game Code (FGC) Sections 2050 through 2085). The CESA generally parallels the main provisions of the ESA and is administered by the CDFW, who maintains a list of state threatened and endangered species as well as candidate species. The CESA prohibits the “take” of any species listed as threatened or endangered unless authorized by the CDFW in the form of an Incidental Take Permit. Under FGC, “take” is defined as to “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.”

3.2.4 Other State Special Status Species and Communities

The CDFW maintains a list of species of special concern. These are broadly defined as species that are of concern to the CDFW because of population declines and restricted distributions, and/or they are associated with habitats that are declining in California. The criteria used to define special status species are described by the CDFW. Impacts to special status plants, animals, and sensitive natural communities may be considered significant under CEQA.

State Species of Special Concern include those plants and wildlife species that have not been formally listed yet are proposed or may qualify as endangered or threatened. In addition, USFWS Birds of Conservation Concern, and CDFW special status invertebrates are considered special status species by CDFW.

3.2.5 Sensitive Natural Communities

CDFW provides oversight of habitats (i.e., plant communities) listed as Sensitive in the California Natural Diversity Database (CNDDB) and on the California Sensitive Natural Communities List, based on global and state rarity rankings. The natural communities are broken down to alliance and association levels for vegetation types affiliated with ecological sections in California. The alliances on the California Sensitive Natural Communities List coincide with A Manual of California Vegetation (Sawyer et al. 2009). CDFW considers alliances and associations with a state rank of S1 to S3 to be Sensitive. The application of ranking for determination of Sensitive Communities is summarized as follows in Table 1 (NatureServe 2021):

Table 3.1 NatureServe Conservation Status Ranks

Name	Calculated Status Rank	Status Description
Score ≤ 1.5	G1, N1, S1	Critically Imperiled
1.5 ≤ Score ≤ 2.5	G2, N2, S2	Imperiled
2.5 ≤ Score ≤ 3.5	G3, N3, S3	Vulnerable
3.5 ≤ Score ≤ 4.5	G4, N4, S4	Apparently Secure
Score > 4.5	G5, N5, S5	Secure

3.2.6 California Fish and Game Code (FGC)

Natural Community Conservation Planning Act

The Natural Community Conservation Act (Sections 2800-2835 of the FGC, as amended) is administered by the CDFW through their NCCP program. The program involves broad-based conservation planning for regions (multispecies and multihabitat coverage that serve as an alternative to project-by-project mitigation), while allowing for compatible economic activity and development. The Act's conservation requirements are more stringent than existing state and federal requirements for mitigation, as it requires that plan preparers actively participate in the recovery of sensitive species and habitats (while conserving ecosystem function, biological diversity, and ecological integrity of habitats). NCCPs are developed in coordination with landowners, regulatory agencies (including the USFWS and NMFS, as appropriate), and environmental organizations. The purpose of NCCPs are to provide a clear framework for project proponents to avoid, minimize, and mitigate impacts to sensitive resources within the coverage area of the NCCP and allow for an adaptive management approach to conservation. NCCPs and HCPs are often combined into one planning document for particular geographic regions of California.

The Project Area, PSB, and Action Area do not overlap any existing NCCPs.

Native Plant Protection Act

The CDFW administers the Native Plant Protection Act (Sections 1900–1913 of the FGC). These sections allow the California Fish and Game Commission to designate endangered and rare plant species and to notify landowners of the presence of such species. Plant species on California Native Plant Society's (CNPS) California Rare Plant Ranking (CRPR) Lists 1 and 2 are considered eligible for state listing as Endangered or Threatened pursuant to the California Fish and Game Code and CDFW has oversite of these special status plant species as a trustee agency. As part of the CEQA process, such species should be considered as they meet the definition of Threatened or Endangered under Sections 2062 and 2067 of the California Fish and Game Code. CRPR List 3 and 4 plants may warrant protection under CEQA Guidelines 15380 only in special circumstances. CDFW publishes and periodically updates lists of special status species which include, for the most part, the above categories. Additionally, there are 64 plant species designated as "rare" which is a special designation created before plants were rolled into CESA in the 1980s. The CESA and the Native Plant Protection Act (NPPA) required a project to have a "Scientific, Educational, or Management Permit" from CDFW for activities that would result in "take," possession, import, or export of state-listed plant species including research, seed banking, reintroduction efforts, habitat restoration, and other activities relating to any plant designated SE (State endangered), ST (State threatened), SR (State rare), or SC (State candidate for listing).

Birds of Prey and Native Nesting Birds

Sections 3503 and 3513 of the FGC prohibits the take, possession, or needless destruction of the nest or eggs of any bird. Subsection 3503.5 specifically prohibits the take, possession, or destruction of any birds in the orders Falconiformes (hawks and eagles) or Strigiformes (owls) and their eggs or nests. These provisions, along with the federal MBTA, essentially serve to protect nesting native birds. Non-native species, including the European Starling, Rock Dove, and House Sparrow, are not afforded protection under the MBTA or FGC.

Fully Protected Species

The CDFW enforces the FGC, which provides protection for "fully protected birds" (Section 3511), "fully protected mammals" (Section 4700), "fully protected reptiles and amphibians" (Section 5050), and "fully protected fish" (Section 5515). As fully protected species, the CDFW cannot authorize any project or action that would result in "take" of these species, even with an incidental take permit.

Migratory Bird Protection Act (MBPA)

The California Migratory Bird Protection Act (MBPA; FGC Section 3513, as amended) was introduced in the California State Assembly 2019 by Assembly Member Ash Kalra and co-sponsored by the National Audubon Society. The text of the Act specifies that it is unlawful to take or possess any migratory nongame bird as designated in the federal Migratory Bird Treaty Act (16 USC 703-712) before January 1, 2017. This upholds the interpretation of the MBTA under Clinton's

EO 13166, where “take” was defined as both “unintentional as well as intentional.” Governor Gavin Newson signed the Act into law on September 27, 2019. The MBPA effectively closes the federal MBTA loophole on incidental take of migratory birds in California.

Lake or Streambed Alteration Agreement

Streams, lakes, and riparian vegetation that serve as habitat for fish and other wildlife species are subject to jurisdiction by the CDFW under Sections 1600-1616 of the FGC. Any activity that would do one or more of the following: 1) substantially obstruct or divert the natural flow of a river, stream, or lake; 2) substantially change or use any material from the bed, channel, or bank of a river, stream, or lake; or 3) deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into a river, stream, or lake; generally require a 1602 Lake and Streambed Alteration Agreement (LSAA). The term “stream,” which includes creeks and rivers, is defined in the California Code of Regulations (CCR) as follows: “a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation” (14 CCR 1.72). In addition, the term stream can include ephemeral streams, dry washes, watercourses with subsurface flows, canals, aqueducts, irrigation ditches, and other means of water conveyance if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife. Riparian is defined as, “on, or pertaining to, the banks of a stream;” therefore, riparian vegetation is defined as, “vegetation which occurs in and/or adjacent to a stream and is dependent on, and occurs because of, the stream itself.” Removal of riparian vegetation also requires a Section 1602 Lake and Streambed Alteration Agreement from the CDFW.

3.2.7 Coastal Act

The California Coastal Act (California Public Resources Code sections 30000 et seq) was enacted by the State Legislature in 1976 to provide long-term protection of California’s 1,100-mile coastline for the benefit of current and future generations. Coastal Act policies constitute the standards used by the California Coastal Commission (Commission or CCC) in its coastal development permit decisions and for the review of local coastal programs (LCPs) prepared by local governments and submitted to the Commission for approval. These policies are also used by the Commission to review federal activities that affect the Coastal Zone. Among other things, the policies require:

- Protection and expansion of public access to the shoreline;
- Protection, enhancement and restoration of environmentally sensitive habitats;
- Protection of productive agricultural lands, commercial fisheries, and archaeological resources; and
- Protection of the scenic beauty of coastal landscapes and seascapes;

Portions of the Project are located within the Coastal Zone, partially within the State’s Jurisdiction, which is regulated by the Coastal Commission under the Coastal Act. The Palco Marsh is the only portion of the Project within the state’s permitting authority jurisdiction, all other areas are within the local permitting authority’s jurisdiction. An existing Coastal Development Permit exists for activities occurring within the Palco Marsh, and its expected that the existing permit (#1-90-104) would be amended. All new development proposed on tide and submerged lands, and other public trust lands must receive a permit from the Commission (PRC 30519(b), and 30416(d)).

The Coastal Act defines an “environmentally sensitive habitat area” (ESHA) as an “area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments” (Section 30107.5). Three important elements define an ESHA:

1) A geographic area can be designated ESHA because of the presence of individual species of plants or animals or because of the presence of a particular habitat;
2) In order for an area to be designated as ESHA, the species or habitat must be either rare or it must be especially valuable; and
3) The area must be easily disturbed or degraded by human activities.

Coastal Act Section 30240 states in part that:

a) ESHA shall be protected against significant disruption of habitat values, and only uses dependent on such resources shall be allowed within such areas.
b) Development in areas adjacent to ESHA and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.

While there is not a specific list of habitats considered to be ESHA for the state or county, the Commission through the Coastal Act and counties or municipalities through the Local Coastal Program (LCP) are the jurisdictional agencies that exert authority in identifying and protecting ESHA in the course of project activities. In order for the Commission to determine if areas are to be classified as ESHA’s, they often refer to CDFW’s list of California Sensitive Natural Communities. CDFW does not use the term ESHA, but it has been inferred that CDFW terminology of “sensitive natural community ” might be somewhat synonymous to Commission ESHA terminology. The Commission relies on this list to determine if habitats are considered sensitive natural communities and thus potentially ESHA. The global and state rarity ranking can be used to identify areas that may be considered ESHA and subject to protection by the Commission.

Article 4 Section 30231 of the Coastal Act provides that “(t)he biological productivity and the quality of coastal water, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and where feasible restored...” Section 30233 discusses allowable uses of fill in coastal wetlands, of which incidental public service purposes is one of the allowable uses.

3.3 Local Jurisdiction

The Project is located within the jurisdiction of the City of Eureka. The western portion of the Project is within the Coastal Zone, either within the state’s jurisdiction or local jurisdiction. Specifically, Palco Marsh is within the state’s jurisdiction and is therefore regulated by the CCC. An existing Coastal Development Permit for activities in Palco Marsh would be amended to enable Project activities. Other portions of the Project within the Coastal Zone, but outside of Palco Marsh, are under the jurisdiction of the City of Eureka through their Local Coastal Program and a new Coastal

Development Permit would be required for Project activities in those areas. The Project is also anticipated to require a Conditional Use Permit, and Grading Permit from the City.

4. Baseline Conditions

4.1 General Environmental Baseline within the PSB and Action Area

Project components are located throughout the western portion of the City, primarily in areas of commercial, residential, or industrial development (i.e., paved hardscape such as road right-of-way [ROWs]). Project work is also planned just south of Del Norte Street Pier, within wetlands and an existing tidal outfall channel that is hydrologically connected to Humboldt Bay. Portions of the Project occur within the Coastal Zone, with Palco Marsh occurring in the primary permitting jurisdiction of the Coastal Commission, and Clark Slough and other Project components occurring within the local primary permitting jurisdiction, i.e. the City of Eureka. The potential for sensitive biological resources to occur was investigated during the reconnaissance field survey, aquatic resources delineation, and rare plant and SNC surveys (see Section 5.3.).

4.2 Topography and Soils

The elevation of the PSB and Action Area is between 0 and 40 feet (depending on location), and topography is characterized by a generally flat landscape. The U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) identifies the following soil units as occurring within the vicinity of the PSB and Action Area: hydraquents mucky silt loam, strongly saline, 0 to 1 percent slopes (frequently flooded mucky silt loam, characteristic of tidal marshes); urban land-anthraltic xerorthents association, 0 to 2 percent slopes (characteristic of developed lands found upon fluviomarine terraces); hydraquents-wassents, 0 to 3 percent slopes (characteristic of tidal flats), and urban land-halfbluff-redsands complex, 0 to 5 percent slopes (complex sandy loam) (NRCS 2021; Appendix E).

4.3 Habitat Elements

The PSB and Action Area are bordered by urban commercial, residential, or industrial areas. High quality natural habitat of any kind is not present within the PSB and Action Area. Marginal habitat is present that would support some species along the northern end of Palco Marsh (just east of the Del Norte Street Pier) and within the tidal channel south of the Del Norte Street Pier. Outside of these areas, existing habitat is generally not expected to support species but the most urban-adapted species.

4.4 Hydrology and Climate

The hydrologic setting includes Palco Marsh, Clark Slough, the City's storm drainage network on paved urban streets and a tidal inlet/channel of Humboldt Bay located in the western portion of the Project Area. The PSB and Action Area are surficially hydrologically connected to Humboldt Bay either directly or via tide gates which drain Palco Marsh and the wetland ditch west of the marsh to

Humboldt Bay. The tidal channel and all aquatic resources connected to it within the PSB (i.e. Palco Marsh and the wetland ditch adjacent to Palco Marsh) experience two daily high and low tides. Water levels draw down considerably during low tide to expose the mudflat or channel bottoms with small, shallow, isolated pools remaining. This daily tidal extreme does not provide consistent aquatic habitat within the PSB due to the absence of a connected water column within Palco Marsh and the tidal channel during low tide (isolated pools remain within Palco Marsh at low tide). A tide gate exists between Clark Slough and Humboldt Bay, located approximately 0.25 miles downstream of the portion of Clark Slough within the PSB. The Project's staging area is completely paved. Runoff from it drains to wetlands located west of it (outside the Project Area) which connect to Humboldt Bay.

The climate in Eureka is relatively mild and cool due to year-round coastal influences, including fog in the summer months. Precipitation primarily falls in the form of rain at this low elevation. Annual rainfall averages 39.57 inches per year in Eureka (WRCC 2021). Air temperatures vary, with winter/summer highs from the lower 40s (degrees Fahrenheit [°F]) to lower 60s, respectively.

4.5 Habitat Access, Connectivity, and Migratory Corridors

The PSB and Action Area are located within the Pacific Flyway for migratory birds. However, no large expanses of high quality natural habitat exist that would support high levels of migratory species stopover use, breeding, or wintering specifically within the Project Area (although there is considerable suitable habitat in the vicinity, around Humboldt Bay). No "essential connectivity areas," "natural landscape blocks," or "small natural landscape areas" have been identified or mapped in the Project vicinity by the California Essential Habitat Connectivity Project (CDFW 2022a).

The Humboldt Bay tidal channel within the PSB is connected to Palco Marsh, but is not connected surficially to any creek, streams, or rivers. There is no opportunity for upstream migration to other aquatic habitats within the PSB from the tidal channel, and daily high and low tides do not provide consistent habitat for aquatic species within the PSB. The Project does not include any features that would interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors. In addition, the Project would not impede the use of native wildlife nursery sites. The Project would not result in the creation of barriers to fish passage. The Project does not include fencing or other structures that would impede wildlife and would not preclude wildlife mobility, breeding, or reproduction beyond the existing conditions.

5. Methods

5.1 Project Area, Project Study Boundary, and Action Area

Investigations were conducted at various spatial scales to meet the requirements of both CEQA and Section 7 of the ESA. For federally listed species, the Project was evaluated at the level of the ESA Action Area (as defined in Section 2.7). For state special status wildlife species, the Project was evaluated at the level of the PSB (as defined in Section 2.8). For state special status plant species, aquatic resources, and SNCs, the Project was evaluated at the level of the Project Area (as defined in Section 2.6).

5.2 Preliminary Investigation

5.2.1 Database Searches (CNDDB, CNPS, IPaC, and NMFS)

A database search for sensitive plant and wildlife species and SNCs that may occur in the Project vicinity was conducted by GHD on July 12, 2022. Database searches included the CNDDB (CDFW 2022b), CNPS Inventory of Rare and Endangered Vascular Plants (CNPS 2022), USFWS Information for Planning and Conservation (IPaC; USFWS 2022b), and the NOAA Fisheries West Coast Region California Species List Tools (NOAA Fisheries 2021). The search encompassed the U.S. Geological Survey (USGS) quadrangle (quad) centered on the Project Area (Eureka). In addition, citizen science databases were reviewed for additional local wildlife and botanical information (BAMVT 2022, Bumble Bee Watch 2022, eBird 2022, iNaturalist 2022).

Plant species on CNPS CRPR Lists 1 and 2 are considered eligible for state listing as endangered or threatened pursuant to the FGC. The CDFW has oversight of these special status plant species as a trustee agency. As part of the CEQA process, such species should be considered as they meet the definition of threatened or endangered under Sections 2062 and 2067 of the FGC. Scoping for special status plant species included any state or federally listed plants as well as plant species on CNPS CRPR Lists 1 and 2. These database searches are included in Appendix B.

5.2.2 National Wetlands Inventory (NWI)

A search of the USFWS NWI was conducted on June 28, 2021 (and reviewed on July 12, 2022 for any potential changes of which there were none) for the immediate Project vicinity. The NWI mapping for the Project can be found in Appendix D.

5.3 Field Surveys

5.3.1 Special Status Plants

GHD Botanist Rose Dana conducted floristic surveys for special status plants on May 12, and July 26, 2021. Upon addition of an area into the PSB, a third floristic survey occurred by GHD Botanist Jane Cipra on May 18, 2022. The special status plant surveys followed *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* by the California Natural Resource Agency (CDFW 2018) and General Rare Plant Survey Guidelines by the Endangered Species Recovery Program (USFWS 2002).

The Botanical and Aquatic Resources Survey Area (BARSA; defined in Section 2.9) was systematically traversed on foot while searching for potential special status plants and cataloging all plant species encountered. Because the Project includes mudflats that are challenging to navigate, binoculars were used to examine mudflats in the PSB from the bank. Plants were identified to the lowest taxonomic level necessary for rare plant identification. Nomenclature follows *The Jepson Manual* (Baldwin et al 2012). A list of species observed within the BARSA is included in the Botanical Technical Memo (see Appendix G). Surveys were appropriately timed to identify 128-blooming species throughout the BARSA. One special status plant species was detected within the

Project Survey Area, Point Reyes bird's-beak (*Chloropyron maritimum* ssp. *palustre*). An eelgrass (*Zostera marina*) survey was conducted, and none was found in the BARSA.

5.3.2 Sensitive Natural Communities (SNCs)

SNCs were visually assessed in the field on May 11, 24 and 27, 2021, and May 18, 2022 during the aquatic resources delineation. No protocol-level or formal mapping has been conducted at this time, however the Palco Marsh (delineated as a component of GHD's aquatic resources delineation) is considered an SNC by CDFW according to their CNDDB (CDFW 2022b).

5.3.3 Aquatic Resources Delineation

GHD conducted the aquatic resources delineation fieldwork on May 11, 2021 and conducted a follow up site visit to confirm conditions and collect additional data on May 24, 27, 2021 and May 18, 2022. The delineation was conducted within the BARSA as shown in Appendix A, Figure 2. USACE three-parameter wetlands were mapped based on wetland indicative vegetation, hydric soils, and wetland hydrology, the high tide line and the Ordinary High Water Mark (considered Other Waters of the U.S.) line features based on vegetation and hydrology indicators. The Project is within the Coastal Zone, predominantly within the State's Jurisdiction, which is regulated by the Coastal Commission under the Coastal Act and also within the local jurisdiction regulated by the City of Eureka's Local Coastal Program. Therefore one- or two-parameter wetlands were also mapped per the Coastal Act, however no one-parameter wetlands were observed. Both three- and two-parameter wetlands, and Other Waters of the U.S. (tidal resources below the high tide line, freshwater resources below the Ordinary High Water Mark), were mapped. See Figure 3A and 3B in Appendix F for a map of delineated aquatic resources.

5.3.4 Reconnaissance Level Survey and Habitat Evaluation Methods

A reconnaissance-level biological field survey was conducted by Genevieve Rozhon, GHD Wildlife Biologist (hereafter surveyor), on July 7, 2021 from 0930 to 1200. Weather conditions included overcast skies, fog drip, temperatures in the high 50s to low 60s (degrees Fahrenheit), with winds less than 5 miles per hour (Beaufort scale 1 to 2). The surveyor started at the intersection of Dollison and D Streets in Eureka, gradually moving west and north while investigating Project Area components (see Appendix A, Figure 1). The surveyor ended the survey at the north end of Commercial Street.

With the exception of the Project Area components located at the western end of Del Norte Street, and the new proposed trash capture device at Koster Street and Washington Street, all Project components were located within the road ROW/existing pavement and surrounded by either single-family residential areas or a mix of residential and commercial areas. In these locations, no natural habitat was present/remaining with the exception of marginal habitat provided by landscaped front yards.

The survey methods were intended to identify sensitive habitat and detect wildlife activity. Where the habitat allowed the surveyor to walk without risk of damaging potential habitat (such as nests) and surrounding vegetation, the survey included a physical search of the area. This included inspecting the ground, shrubs, culverts, holes, etc. for the presence of any wildlife species. Additionally, the ground layer under vegetation was inspected for evidence of wildlife species, such as feathers, pellets, whitewash, scat, tracks, etc. This reconnaissance-level survey was conducted to identify general wildlife resources and habitat in the PSB and Action Area. No protocol-level surveys for special status wildlife were conducted at this time.

5.3.5 Fisheries Monitoring and eDNA Sampling

Fisheries presence/absence sampling and environmental DNA (eDNA) sampling occurred on April 27, 2022 in Palco Marsh and Clark Slough by Ross Taylor and Associates (RTA) and Cal Poly Humboldt. No special status fish or other aquatic species (such as lamprey) were captured or observed. According to the RTA and Cal Poly Humboldt (2022) report:

The sampling occurred near the top of the high tide and flow from Humboldt Bay was still slowly moving into the Palco Marsh channel. Approximately 800 feet of the Palco Marsh channel was sampled and approximately 100 feet of Clark's Slough was sampled. At the Palco Marsh site, the reach sampled extended from W. Del Norte Street, south to the culvert outflow into Humboldt Bay (where tidal exchange occurs) (see Figure 2 in Appendix H). At the Palco Marsh site, the water samples for eDNA sampling were collected at four locations, spaced approximately 150 feet apart. The water samples were collected prior to the seine netting so that stirred-up bottom sediments didn't contaminate the water samples. After the water samples were collected the entire Palco Marsh reach was sampled with a 10-foot-long seine net with an 1/8-inch mesh, so that if present, salmonids, Longfin Smelt and Tidewater Goby would be captured by the small mesh. The seine netting pass was made against the current of the incoming tide and we periodically lifted the net to remove fish (see Figure 3 in Appendix H). All fish were temporarily held in a five-gallon pail with a battery powered aerator.

At Clark Slough, the field methods were similar, with the eDNA water samples collected and water quality measured prior to seine netting. Three water samples were collected at Clark's Slough, one right at the culvert outlet and two more, taken approximately 50 feet and 100 feet downstream of the culvert outlet. Approximately 100 feet of channel was netted and three passes were made with a 20-foot-long seine net with an 1/8-inch mesh (see Figure 4 in Appendix H). All fish were temporarily held in a five-gallon pail with a battery powered aerator.

The channel reach at Palco Marsh was relatively uniform with a mud bottom, with minimal cover habitat for fish, and depths between 0.5 and 1.0 feet; except adjacent to the tidal exchange culvert where the maximum depth was 2.3 feet. The only species of fish caught at this location was Pacific Staghorn Sculpin and a total of 27 fish were caught. Water quality measurements taken at the five eDNA sample locations yielded depths of predominantly 0.5 feet (with one location having a depth of 1.5 feet), dissolved oxygen ranging from 9.79 mg/L to 10.38 mg/L, temperatures from 12.3 to 13.5 degrees (°) Celsius (C) (54° to 56° Fahrenheit [F]) and salinity content of 29.1 to 30.5 parts per thousand (ppt).

The channel reach at Clark's Slough was relatively uniform with a firm mud bottom, overhanging herbaceous riparian vegetation, and depths between 2.5 and 3.0 feet. Two species of fish were caught at this location; Pacific Staghorn Sculpin (44 fish caught) and three-spine stickleback (61 fish caught). Water quality measurements taken near the culvert outlet, from the near surface to the bottom, in 0.5- to 1-foot intervals yielded dissolved oxygen ranging from 7.27 mg/L (at 0.5 feet) to 5.93 mg/L (at 3.0 feet), temperatures of 13.3°C/56°F (at 0.5 feet) to 13.4°C/56°F (at 3.0 feet), and salinity concentration of 13.9 ppt (at 0.5 feet) to 28.5 ppt (at 3.0 feet). The salinity concentration suggests that tidal water is leaking into Clark Slough at an unknown concentration or frequency.

5.3.6 Agency Coordination

Official species lists for the Project quadrangle (Eureka) were obtained from the USFWS and NMFS. No further agency coordination has occurrence at this time.

6. Results

6.1 Summary of General Biological Resources

Based on occurrence records, field surveys, and habitat availability, several special status plants, SNCs, and jurisdictional aquatic resources have potential to occur or are known to occur in the Project Area or PSB. In addition, several special status wildlife species have some low potential to occur in the Project Area, PSB, or Action Area, as described further below. Common, urban-adapted wildlife species are most likely to occur based on existing habitat conditions (but are not addressed herein).

6.2 Special Status Plants

6.2.1 Federally listed Plant Species

Three federally listed plant species (all endangered) that are regulated by the USFWS under the ESA were identified as being previously recorded within the vicinity of the Project Area (i.e., within the 1 quad search area): beach layia (*Layia carnosa*), Menzies' wallflower (*Erysimum menziesii*), and western lily (*Lilium occidentale*). These species are also California state listed under CESA and have state rare plants rankings of S1 or S2. None of these records overlapped with the Action Area or occurred in the immediate Project vicinity (nearest occurrences all associated with coastal dune) with the exception of a non-specific record for western lily. No suitable habitat (i.e., coniferous forest, freshwater marsh, or coastal grassland) for western lily is present in the Action Area; species occurrences are well-documented, and none are known from the Project vicinity (closest known population at Table Bluff Ecological Reserve, approximately six miles to the south) (USFWS 2009, CDFW 2022d). All of these species were excluded from further consideration based on a lack of suitable habitat within the Action Area.

6.2.2 California State Listed or Special Status Plant Species

No CESA listed plants, other than the three previously described (those also listed as federally endangered) above in Section 6.2.1., and eliminated from further consideration due to a lack of habitat present, were identified during scoping. Twenty-five species with rare plant rankings of 1 or 2, tracked by the CNDDB or CNPS, were identified during scoping in the vicinity of the Project Area (i.e., within the 1 quad search area). Of these, nine have high potential to occur: coastal marsh milk-vetch (*Astragalus pycnostachyus* var. *pycnostachyus*), Humboldt Bay owl's clover (*Castilleja ambigua* var *humboldtiensis*), Point Reyes bird's beak (*Chloropyron maritimum* ssp. *palustre*), Pacific gilia (*Gilia capitata* ssp. *pacifica*), marsh pea (*Lathyrus palustris*), Howell's montia (*Montia *howellii*), Siskiyou checkerbloom (*Sidalcea malviflora* ssp. *patula*), western sand-spurrey (*Spergularia canadensis* var. *occidentalis*), and alpine marsh violet (*Viola palustris*). Potential to occur was determined based on 1) current species distribution in relation to the Project, 2) nearby occurrence records, 3) potentially suitable habitat present, 4) professional judgement based on field surveys. Several of these records overlapped with the Project Area or were documented in the immediate Project vicinity (it is important to note though, that these were non-specific record locations, and by no means indicative of species presence within the Project Area). See Appendix B for database search results.

One special status plant species, Point Reyes bird's-beak, was observed during floristic surveys within the BARSA. No special status plants were observed in the initial May 12, 2021 survey. The May survey was appropriately timed to observe potentially occurring early-blooming special status plants such as Howell's montia (*Montia howellii*), which has been documented in similar roadside habitats. The July 26, 2021 survey was appropriately timed to observe the many later-blooming special status plants that have the potential to occur in the area, including western sand-spurrey . Point Reyes bird's-beak was discovered on July 26th in a small relatively confined population of approximately 100 plants and was just beginning to bloom, see Figure 3 in Appendix G for the location of the observed population. Point Reyes bird's-beak has also been seen emerging during July in other similar habitats. The floristic survey that occurred on July 26th was conducted during a negative ocean tide of -1.1 feet, which was appropriate for surveying eelgrass, and none was found rooted in the BARSA. An additional survey occurred on May 18, 2022, throughout a portion of the BARSA; no special status plants were observed during the May 2022 survey. Surveys were appropriately timed for the blooming period, which appeared to have shifted slightly earlier this year likely due to the dry and warm conditions. No additional special status plant surveys are needed within the designated PSB.

6.3 Sensitive Natural Communities

One SNC was identified during scoping in the vicinity of the Project Area (i.e., within the 1 quad search area): Northern Coastal Saltmarsh. Its potential (and the potential of other SNCs and/or upland ESHA) to occur in the BARSA was visually assessed during the site visit on May 11, 2021. This SNC (Northern Coastal Saltmarsh) was documented during this survey in Wetland 2. Because this SNC is also an aquatic resource, it is described below as an aquatic resource and potential impacts to it are analyzed under the Clean Water Act.

6.4 Aquatic Resources

The wetland delineation resulted in four three-parameter wetlands with hydric soil, hydrophytic vegetation, and hydrology indicators located at Palco Marsh (W2), on the upstream (W3) and downstream (W4) side of a culvert near Felt Street, and in a muted tidal ditch located immediately west of the recreational trail (W5) (see Appendix F). The total area of three-parameter wetlands within the Project Area is 213,575 ft^2 (4.90 acres). A tidal inlet of Humboldt Bay is located in the western portion of the Project Area, and a total of 43,350 ft2 (1.00 acres) is considered below the high tide line, and Clark Slough (a historically tidal waterway that is disconnected from Humboldt Bay via a tide gate) contains approximately 4,095 ft^2 (0.09 acre) of aquatic resources below the Ordinary High Water Mark. A two-parameter wetland was identified near the terminus of Del Norte

Street (W1) and occupies 930 ft2 (0.02 acres). Wetland 1 lacked a dominance of hydrophytic vegetation, however contained hydric soils and wetlands hydrology. Wetlands 1 through 5 (W1-W5) are all surficially hydrologically connected to Humboldt Bay, and it is anticipated that all aquatic resources delineated will be USACE and RWQCB jurisdictional resources. Additionally, all delineated aquatic resources are within the Coastal Zone, either under the jurisdiction of the California Coastal Commission or under local jurisdiction, i.e. the City of Eureka.

6.5 Special Status Wildlife

6.5.1 Wildlife Reconnaissance Survey and Habitat Evaluation Results

With the exception of the Project Area components located at the western end of Del Norte Street, and the new proposed trash capture device at Koster Street and Washington Street, the Project is surrounded by residential, industrial, or commercial properties and areas of hardscape. No natural habitat remains in or around Project components located on the eastern side of the PSB. The only vegetation present consists of landscaped front yards (including some trees, although the majority are largely ornamental in type). Patchy trees and structures such as buildings in this area may provide some nesting habitat for common avian species protected under the MBTA and FGC. However, no habitat suitable for special status species is present.

The only remaining natural habitat in the Project Area consists of wetlands (Palco Marsh; described in Section 6.4), Clark Slough, and the tidal channel located south of the Del Norte Street Pier, within the southwest portion of the Project Area. Palco Marsh is expected to provide foraging and nesting habitat for a bird species protected under the MBTA and FGC and for salt tolerant special status amphibians. The tidal channel may also provide habitat for fish and benthic invertebrates, and foraging habitat for wading birds and shore birds. The shallow, dynamic nature of the tidal channel, low tide extremes which leaves very little aquatic habitat, lack of channel complexity, lack of connection to upstream habitat is expected to restrict use by special status fish species. This expected absence of fish species is reinforced by fisheries monitoring and eDNA sampling which indicated an absence of coho salmon, chinook salmon, steelhead and tidewater goby. However, potential presence cannot be completely ruled out. See photos of the Project vicinity in Appendix C.

6.5.2 Federally listed Wildlife Species

The following fourteen federally listed or under review wildlife species (including three endangered and ten threatened, and one under review) that are regulated by the USFWS or NMFS under the ESA were identified during scoping in the vicinity of the Action Area (i.e., the 1-quad search area): Ridgway's rail (*Rallus obsoletus obsoletus*; endangered), green sturgeon (*Acipenser medirostris*; threatened) southern Distinct Population Segment (DPS), Western snowy plover (*Charadrius nivosus nivosus*; threatened), Southern Oregon Northern California Coast (SONCC) coho salmon (*Oncorhynchus kisutch*; threatened) Evolutionarily Significant Unit (ESU), California Coast (CC) chinook salmon (*Oncorhynchus tshawytscha*; threatened) ESU, Northern California (NC) steelhead (*Oncorhynchus mykiss irideus*; threatened) DPS, eulachon (*Thaleichthys pacificus*; threatened), longfin smelt (*Spirinchus thaleichthys*; under review), tidewater goby (*Eucyclogobius newberryi*; endangered), Pacific marten (*Martes caurina*; threatened) coastal DPS, marbled murrelet (*Brachyramphus marmoratus*; threatened), northern spotted owl (*Strix occidentalis caurina*;

threatened), short-tailed albatross (*Phoebastria* [=*Diomedea*] *albatrus*; endangered), and yellow-billed cuckoo (*Coccyzus americanus*; threatened) Western DPS.

All terrestrial federally listed species noted above have no potential to occur in the Action Area based on a lack of suitable habitat present and/or the fact that the Action Area is outside the species current range. Fully marine species (i.e., turtles and marine mammals) also came up during scoping within the 1-quad search area. However, these species are not discussed herein, due to a lack of open, marine habitat in the Action Area. In addition, fish species above preferring open water habitat in the Bay (e.g., green sturgeon [Pinnix 2010]) were excluded based on the lack of suitable conditions in the Action Area (i.e., narrow, shallow tidal channel). Eulachon were discounted based on a lack of recent records outside of the Klamath River (Allen et al. 2006, Gustafson et al. 2016), and negligible potential for presence in Humboldt Bay.

There is marginal aquatic habitat present within the Action Area (specifically the tidal channel south of the Del Norte Street pier; an extension of Humboldt Bay) that may occasionally support some level of use by federally-listed fish species. There are records of salmon caught off the immediately adjacent Del Norte Street Pier (Pier Fishing in California 2018) and nearby records of longfin smelt (Garwood 2017). However, regular presence of special status fish is not expected within the tidal channel itself, as water levels draw down considerably during low tide (and overall depths appear quite shallow). In addition, while eelgrass beds that serve as habitat/refugia for many fish species have been documented in the immediate vicinity off the Del Norte Street pier (CDFW 2021a), none has been mapped within the tidal channel itself. Rooted eelgrass was not observed in the channel during the July 7, 2021 site visit, although floating fragments were present (likely carried into the channel by currents in the bay) (see photos in Appendix C). Fisheries monitoring and eDNA sampling found an absence of Coho Salmon, Chinook Salmon, Steelhead, and Tidewater Goby [Note to City: Cal Poly is re-doing the eDNA analysis for Tidewater Goby] (no Longfin Smelt were observed however no eDNA sampling was conducted for this species) (RTA and Cal Poly Humboldt 2022). The potential for these species to occur would be low, particularly during low tide when only isolated pools within Palco Marsh remain. Project dewatering within Palco Marsh would occur in tandem with the low tide, further reducing the likelihood of these species occurring within Palco Marsh.

Special status fish are not expected to occur at Clark Slough because of the existing tide gate that (at least partially) blocks tidal water from entering the slough channel, and access upstream for migrating anadromous fish. Additionally, similarly to the monitoring within Palco Marsh, fisheries monitoring and eDNA sampling of Clark Slough yielded an absence of Coho Salmon, Chinook Salmon, Steelhead, and Tidewater Goby (no Longfin Smelt were observed however no eDNA sampling was conducted for this species) (RTA and Cal Poly 2022).

It is unlikely these species would occur within the portion of the Humboldt Bay tidal inlet where work is proposed, Palco Marsh or Clark Slough for the aforementioned reasons, however presence of the following federally and state listed or under review species in these areas cannot be completed discounted: Longfin Smelt, Coho Salmon, Chinook Salmon, Steelhead and Tidewater Goby.

6.5.3 California State Listed or Special Status Wildlife Species

Six state listed or candidate wildlife species (including two endangered, three threatened, and one candidate species) that are regulated by the CDFW under the CESA were identified during scoping in the vicinity of the PSB (i.e., the 1-quad search area). These include the Bank Swallow (*Riparia riparia*; threatened), Western Bumble Bee (*Bombus occidentalis*; candidate endangered), and Northern California Summer Steelhead (*Oncorhynchus mykiss irideus*; endangered), as well as the following species described above in Section 6.5.2 (which are also state listed or state candidates for listing): Ridgway's Rail, Coho Salmon, and Longfin Smelt. None of these species have potential to occur in the PSB with the exception of Summer Steelhead, Coho Salmon, and Longfin Smelt (specifically within the Humboldt Bay tidal inlet).

In addition, occurrences for 20 other wildlife species with special state protections (or tracked via the CNDDB) were identified within the 1-quad search area. The majority of these species were excluded from analysis due to the lack of suitable habitat or the fact the that Project Area and PSB are outside the current range of these species. However, one aquatic species was identified as having potential to occur in the PSB: Pacific Lamprey (*Entosphenus tridentatus*; CDFW Species of Special Concern [SSC]). In addition, terrestrial species likely to occur in the PSB include the Northern Red-legged Frog (*Rana aurora*; CDFW SSC), Great Egret (*Ardea alba*; CDFW Special Animals List [SAL]), Great Blue Heron (*Ardea herodias*; SAL), Northern Harrier (*Circus hudsonius*; SSC), Snowy Egret (*Egretta thula*; SAL), White-tailed Kite, (*Elanus leucurus*; CDFW Fully Protected), and Black-crowned Night Heron (*Nycticorax nycticorax*; SAL). See Appendix B for a full list of all special status species considered during scoping.

6.6 Critical Habitat

The Action Area overlaps federally designated critical habitat within Humboldt Bay for the Green Sturgeon, southern DPS. Critical habitat was designated for this species effective November 9, 2009 (74 FR 52299). This designation includes Humboldt Bay up to the mean higher high water (MHHW) line within portions of the Project Area and Action Area specifically within the tidal channel south of the Del Norte Street Pier. The only work proposed in the tidal inlet is the installation of two culverts to replace the existing outfall that drains into Humboldt Bay from Palco Marsh. Work would occur during low tide and cofferdam (or similar) would be installed to isolate the work area. No aquatic species relocation would occur in this area because at low tide no water remains, just mudflat, and thus no fish are present; mudflat habitat would not be modified following Project activities.

The USFWS recently revised their guidance on critical habitat (both in terms of designation and Section 7 consultations). The term “Primary Constituent Elements” (PCEs) has been replaced with “physical or biological features” (PBFs) to describe elements necessary for the conservation of the species (84 FR 45020). In terms of Section 7 consultations, Project proponents are required to analyze impacts to PBFs within designated critical habitat. A “may affect” finding is made if “the proposed action or other activities that are caused by the proposed action may result in changes to one or more critical habitat PBFs in the Action [A]rea” (USFWS 2020). For the purposes of this analysis, we considered elements previously defined as green sturgeon PCEs (as PBFs have not been defined).

PCEs for green sturgeon, southern DPS in estuarine areas include the following (reprinted from 74 FR 52299).:

1) *Food resources*. Abundant prey items within estuarine habitats and substrates for juvenile, subadult, and adult life stages. Prey species for juvenile, subadult, and adult green sturgeon within bays and estuaries primarily consist of benthic invertebrates and fishes, including crangonid shrimp, burrowing thalassinidean shrimp (particularly the burrowing ghost shrimp), amphipods, isopods, clams, annelid worms, crabs, sand lances, and anchovies. These prey species are critical for the rearing, foraging, growth, and development of juvenile, subadult, and adult green sturgeon within the bays and estuaries.

2) *Water flow*. Within bays and estuaries adjacent to the Sacramento River (i.e., the Sacramento-San Joaquin Delta and the Suisun, San Pablo, and San Francisco bays), sufficient flow into the bay and estuary to allow adults to successfully orient to the incoming flow and migrate upstream to spawning grounds.

3) *Water quality*. Water quality, including temperature, salinity, oxygen content, and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages. Suitable water temperatures for juvenile green sturgeon should be below 24 °C.

4) *Migratory corridor*. A migratory pathway necessary for the safe and timely passage of Southern DPS fish within estuarine habitats and between estuarine and riverine or marine habitats. Within bays and estuaries outside of the Delta and the Suisun, San Pablo, and San Francisco bays, unimpeded passage is necessary for adult and subadult green sturgeon to access feeding areas, holding areas, and thermal refugia, and to ensure passage back out into the ocean.

5) *Water depth*. A diversity of depths necessary for shelter, foraging, and migration of juvenile, subadult, and adult life stages. Subadult and adult Green Sturgeon occupy a diversity of depths within bays and estuaries for feeding and migration. Tagged adults and subadults within the San Francisco Bay estuary primarily occupied waters over shallow depths of less than 10 m, either swimming near the surface or foraging along the bottom

6) *Sediment quality*. Sediment quality (i.e., chemical characteristics) necessary for normal behavior, growth, and viability of all life stages. This includes sediments free of elevated levels of contaminants (e.g., selenium, PAHs, and pesticides) that can cause adverse effects on all life stages of green sturgeon.

The presence and extent of PCEs within Action Area (specifically aquatic habitat within the tidal channel) were visually evaluated by the GHD Wildlife Biologist during the reconnaissance level survey on July 7, 2021. PCEs related to upstream migration (#2, and #4) are not present, as they are related to staging or orientation for upstream migration (Sacramento and San Joaquin Rivers are the known spawning grounds for this DPS); southern DPS green sturgeon are not known to spawn in any rivers hydrologically connected to Humboldt Bay. PCE #5 is also absent, as the tidal channel is narrow, channelized, shallow, and does not contain a diversity of depths in relation to aquatic habitat. PCEs #1, #2, and #6 may be present but would require aquatic and benthic sampling to confirm. However, presence of these PCEs does not in any way serve as evidence that green sturgeon may occur in the Action Area (as stated in Section 6.5.2., overall habitat in the tidal channel is not believed to be suitable for this species during summer presence/feeding in the Bay [Pinnix 2010]). While Project activities will occur in the tidal channel (which is designated critical habitat), temporary dewatering and installation of outfall drains are not expected to significantly alter the quality or quantity of any PCEs (if present) in the channel.

6.7 Essential Fish Habitat

Essential Fish Habitat (EFH) has been defined for the purposes of the MSFCMA as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity". NOAA Fisheries has further added the following interpretations to clarify this definition:

- "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish, and may include areas historically used by fish where appropriate;
- "Substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities;
- "Necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and
- "Spawning, breeding, feeding, or growth to maturity" covers the full life cycle of a species.

Adverse effect means any effect that reduces quality and/or quantity of EFH, and may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey or reduction in species fecundity), or site-specific or habitat-wide effects, including individual, cumulative, or synergistic consequences of actions. EFH consultation with the NOAA Fisheries is required regarding any federal agency action that may adversely affect EFH, including actions that occur outside EFH, such as certain upstream and upslope activities.

The MSFCMA requires that EFH be identified for all federally managed species including all species managed by the Pacific Fisheries Management Council (PFMC). The PFMC is responsible for managing commercial fisheries resources along the coast of Washington, Oregon, and California. Managed species that have a potential to occur in the action area are described in a Fishery Management Plan (FMP). The PFMC is "guided by the principle that there should be no net loss of the productive capacity of marine, estuarine, and freshwater habitats that sustain commercial, recreational, and tribal salmon fisheries beneficial to the nation" (PFMC 2016).

Humboldt Bay within the Project Area is mapped as EFH for species managed under the Pacific Coast Salmon FMP, the Pacific Groundfish FMP, and the Coastal Pelagics FMP (mapping not fine scale enough to determine if tidal channel included, but conservatively assuming so for the purposes of this analysis) (NOAA 2020a). The Pacific Coast Salmon FMP (PFMC 2021) designates five Habitat Areas of Particular Concern, which include complex channels and floodplain habitats, thermal refugia, spawning habitat, estuaries, and marine and estuarine submerged aquatic vegetation (SAV). The Coastal Pelagics Fishery Management Plan (as amended) was created to promote efficient, sustainable, and profitable fishery practices and to prohibit the harvest of krill species (PFMC 2019). The Highly Migratory Species Fishery Management Plan (as amended) seeks to manage sustainable fisheries in the eastern Pacific Ocean across jurisdictional boundaries (PFMC 2018). The Pacific Coast Groundfish Fishery Management Plan (as amended) prohibits activities such as bottom trawling and dredging that could result in long-term damage to the ocean floor. In addition, the plan designates HAPCs such as kelp, eelgrass beds, and estuaries (PFMC 2020).

Due to the nature of the Project, the following adverse effects could potentially occur to EFH:

- Short-term loss of habitat within the tidal channel
- Short-term increased turbidity and suspended sediment
- Contaminant release

However, the Project makes up a very small portion of aquatic habitat within Humboldt Bay, and activities would be of a short duration and located on the bank of Humboldt Bay (not within the channel bottom). No HAPCs (e.g., eelgrass) are known to occur or were observed during the reconnaissance level survey within the Action Area. Conservation measures would be implemented to ensure that the Project avoids and/or minimizes any adverse effects. Proposed effects on EFH would be insignificant.

6.8 Limitations That May Influence Results

Conclusions for this BRE were drawn from historic surveys and studies, as well as web-based sensitive species database and literature searches, recent studies, and field surveys. As these studies/surveys only serve as a snapshot of conditions during a short time period, they may not accurately reflect actual occurrence of species presence in the Project vicinity at a given time. Therefore, conclusions in this BRE have been based more on the assumption of their presence or non-presence given existing habitat in the PSB and Action Area, and impact minimization measures have been developed accordingly. In addition, all determinations herein were based on the current Project footprint (Appendix A, Figure 1) and proposed Project description. If the Project footprint or construction methods change significantly prior to Project implementation, determinations would need to be revisited, to ensure that they are still accurate.

6.9 Assessment of Project Effects

In general, Project activities would be localized and temporary and are not expected to result in any long term or significant impacts to sensitive biological resources. However, based on the current Project description and footprint, it is anticipated that effects could occur to aquatic resources, Northern Red-legged Frogs, and migratory birds via the following activities: clearing and grubbing, placement of fill (including installation of a new outfall along the bank of the tidal channel, and installation of new pipes between the outfall and Palco Marsh), temporary dewatering to accommodate work in a small area of the tidal channel, as well as Palco Marsh and Clark Slough, and the potential need to relocate fish from Palco Marsh and/or Clark Slough in association with dewatering. As mentioned in Section 5.3.5, it is unlikely special status fish species would be encountered and relocated during dewatering because of the daily extreme low tides, absence of these species during fisheries monitoring and eDNA sampling, and because dewatering would occur in tandem with the low tide which is when little aquatic habitat (besides potential isolated pools) to support fish species or lamprey exists.

7. Future Actions

7.1.1 Reasonably Foreseeable Potential Non-Federal Actions

There are no known, reasonably certain to occur, non-federal actions proposed within the Action Area.

7.1.2 Reasonably Foreseeable Potential Federal Actions

No foreseeable potential federal actions are expected or known for the Action Area at this time.

8. Recommended Avoidance and Minimization Measures

8.1 Proposed Avoidance and Minimization Measures

With implementation of the avoidance and minimization measures proposed below, it is anticipated at this stage of the Project that impacts to all biological resources would be reduced to less than significant with mitigation incorporated.

8.1.1 Plants

Rare plant surveys have been completed, and one additional survey is proposed to document the observed population of Point Reyes bird's-beak for construction avoidance. The identified area with rare Point Reyes bird's-beak will be avoided and no impact would occur.

8.1.2 Sensitive Natural Communities

The Palco Marsh is considered a Sensitive Natural Community, although it contains a dominant population of invasive dense-flowered cordgrass. Standard construction BMPs will be implemented to reduce potential sediment input into Palco Marsh. Because Palco Marsh is an aquatic resource, potential impacts to it would be addressed and mitigated for under Section 404 of the Clean Water Act in consultation with the USACE.

8.1.3 Aquatic Resources

Aquatic resources would be avoided as much as possible during Project implementation. Temporary impacts to aquatic resources (within Palco Marsh) would occur, however following construction areas of temporary impact would be restored to pre-Project conditions which may include supplemental planting of CA native vegetation. Potential permanent impacts to aquatic resources would be addressed and mitigated for under Section 404 of the Clean Water Act in consultation with the USACE at a ratio of at least 1:1.

8.1.4 Wildlife

8.1.4.1 Federally Listed Salmonids

To minimize impacts to special status fish and lamprey species, the following avoidance and minimization measures are proposed:

- Silt fences and other erosion control measures shall be deployed along construction areas adjacent to Humboldt Bay, wetlands, and waters to prevent sediment input into these resources. If the silt fences are not adequately containing sediment, construction activity shall cease until remedial measures are implemented that prevent sediment from entering the waters below the construction area.
- Construction materials, debris, or dredge material, shall not be placed or stored where it could enter into aquatic resources.
- Fueling and equipment maintenance shall occur at least 100 feet away from wetlands and waterways.
- Prior to the start of construction activities, and if water is present within the Project construction limits, surveys for federal and/or state listed fish species (which for the purpose of this measure include salmonids, Tidewater Goby and/or Longfin Smelt) shall be conducted by a qualified biologist in pooled or moving water within the work area. If no water and/or federal and/or state listed species are present, no further actions related to surveys for listed species and relocation are required.
- If standing water and federal and/or state listed fish species are identified, additional fish protection activities (such as relocation) would be coordinated with NMFS, CDFW and USFW under incidental take authority. Non-listed, but special status aquatic species (such as lamprey) would also be relocated. A suitable release location would be identified in advance within Humboldt Bay, and a relocation plan prepared for agency approval. Relocation of federal and/or state listed fish species would be carried out by a qualified biologist pre-approved by NMFS, CDFW and USFW.
- Based on NMFS, CDFW and USFW-approval of the relocation plan, a qualified fisheries biologist or aquatic ecologist would then perform appropriate seining, dip netting, or other trapping procedures to a point at which the biologist/ecologist is assured that all federal and/or state listed fish species individuals (and/or other special status aquatic species individuals) within the construction area have been caught. These individuals would be kept in insulated coolers equipped with battery operated aerators to ensure survival and would be relocated to appropriate habitat as identified and agreed upon by NMFS, CDFW and USFW. Non special status fish would be relocated as is feasible.
- If mortalities of federal and/or state listed fish species, or special status aquatic species occur, individuals shall be collected and frozen for delivery to NMFS, CDFW and USFW. Construction activities shall be prohibited from unnecessarily disturbing aquatic habitat.
- Prior to the start of construction activities, a qualified biologist shall provide on-site worker environmental awareness training (tailboard) for crews at the commencement of construction. The training would include identification and life history of sensitive species (including the special status salmonids), applicable regulations, species and habitat protection measures, fines and penalties, and procedures to be followed if sensitive species are observed on-site.

8.1.4.2 Northern Red-legged Frogs

Impacts to northern red-legged frogs in the Project Area and PSB may include temporary habitat destruction as well as injury or mortality as a result of crushing or burying from vehicle use and excavation/earth moving. However, it is unlikely that northern red-legged frogs would be substantially impacted due to the absence of freshwater dominant habitat. Salinities within Palco Marsh were at approximately 30 ppt, and were between 14 and 28 ppt in Clark Slough. Typical tolerance levels of California red-legged frog (which is genetically similar to northern red-legged frog) for egg laying and tadpoles are 4.5 ppt and 6.6 ppt, respectively (Reiss 1999). Adult frogs have a higher tolerance for saline conditions. In addition, elevated levels of noise may mask species calls during the breeding season (some species call during both the day and night). To avoid impacts to northern red-legged frogs, the following avoidance and minimization measures are proposed.:

- No more than one week prior to commencement of ground disturbance within 50 feet of suitable amphibian habitat, a qualified biologist shall perform a pre-construction survey for Northern Red-legged Frogs and shall relocate any individuals or egg masses that occur within the work-impact zone to nearby suitable habitat.
- In the event that a Northern Red-legged Frog is observed in an active construction zone, the contractor shall halt construction activities in the immediate area where observed and the frog(s) shall be moved to a safe location in similar habitat outside of the construction zone.

8.1.4.3 Nesting Birds

There is potential for common and state special status avian species, protected under the MBTA and FGC to nest in the PSB. However, no tree removal would occur which would reduce potential impacts to avian species. Potential Project impacts to special status birds during construction may include visual disturbance, habitat destruction, and noise disturbance. The following measures are proposed to avoid potential impacts.

- Ground disturbance and vegetation clearing shall be conducted, if possible, during the fall and/or winter months and outside of the avian nesting season (generally March 15 – August 15) to avoid any direct effects to protected birds. If ground disturbance cannot be confined to work outside of the nesting season, a qualified ornithologist shall conduct pre-construction surveys within the vicinity of the Project Area, to check for nesting activity of native birds and to evaluate the site for presence of raptors and special status bird species. The ornithologist shall conduct at minimum a one-day pre-construction survey within the 7-day period prior to vegetation removal and ground-disturbing activities. If ground disturbance or vegetation removal work lapses for seven days or longer during the breeding season, a qualified ornithologist shall conduct a supplemental avian pre-construction survey before Project work is reinitiated.
- If active nests are detected within the construction footprint or up to 500 feet from construction activities, the ornithologist shall flag a buffer around each nest (assuming property access). Construction activities shall avoid nest sites until the ornithologist determines that the young have fledged or nesting activity has ceased. If nests are documented outside of the construction (disturbance) footprint, but within 500 feet of the construction area, buffers would be

implemented as needed (buffer size dependent on species). Buffer sizes for common species would be determined on a case-by-case basis in consultation with the CDFW and, if applicable, with USFWS. Buffer sizes would consider factors such as (1) noise and human disturbance levels at the construction site at the time of the survey and the noise and disturbance expected during the construction activity; (2) distance and amount of vegetation or other screening between the construction site and the nest; and (3) sensitivity of individual nesting species and behaviors of the nesting birds.

- If active nests are detected during the survey, the qualified ornithologist shall monitor all nests at least once per week to determine whether birds are being disturbed. Activities that might, in the opinion of the qualified ornithologist, disturb nesting activities (e.g., excessive noise), shall be prohibited within the buffer zone until such a determination is made. If signs of disturbance or distress are observed, the qualified ornithologist shall immediately implement adaptive measures to reduce disturbance. These measures may include, but are not limited to, increasing buffer size, halting disruptive construction activities in the vicinity of the nest until fledging is confirmed or nesting activity has ceased, placement of visual screens or sound dampening structures between the nest and construction activity, reducing speed limits, replacing and updating noisy equipment, queuing trucks to distribute idling noise, locating vehicle access points and loading and shipping facilities away from noise-sensitive receptors, reducing the number of noisy construction activities occurring simultaneously, and/or reorienting and/or relocating construction equipment to minimize noise at noise-sensitive receptors.

9. Effects Determinations

9.1 ESA Listed Species Determinations

This BRE has been prepared in compliance with Section 7(c) of the ESA to evaluate the potential adverse effects of the proposed Project on federally listed endangered or threatened species. The proposed Project is described in Section 2. Of the 17 federally listed species with potential to occur in the Action Area (three plants and 14 wildlife species), all federally listed terrestrial wildlife species were excluded from further analysis due to the lack of suitable habitat in the Action Area and/or because the Action Area lies outside of the species' known current geographic range. The Project could, but is not likely to, result in take of several federally listed fish species. Potential (but unlikely) take would be associated with temporary dewatering of a small portion of the tidal channel south of the Del Norte Street Pier, as well as Palco Marsh and Clark Slough. Take of fish species would not likely occur because fish species are unlikely to be present in the Action Area at low tide (which is when dewatering would occur) as supported by fish monitoring and eDNA analysis (RTA and Cal Poly Humboldt 2022).

As the Project is outside the species range and/or suitable habitat is absent within the Action area, the Project would have no effect on the following species:

- beach layia
- Menzies' wallflower

- western lily
- Ridgway's Rail
- Green Sturgeon
- Western Snowy Plover
- Eulachon
- Pacific Marten
- Northern Spotted Owl
- Marbled Murrelet
- Short-tailed Albatross
- Yellow-billed Cuckoo

Because temporary dewatering of the small portion of the tidal channel, Palco Marsh and Clark Slough within the Action Area is unlikely to require relocation of the following fish species, the Project may affect, but is not likely to adversely affect the following species:

- Coho Salmon
- Steelhead
- Chinook Salmon
- Tidewater Goby
- Longfin Smelt

9.2 CESA Listed Species Determinations

The Project could but is not likely to result in take of CESA listed Longfin Smelt, Summer Steelhead, and Coho Salmon, because fish relocation of these species is not likely to be occur during temporary dewatering of the tidal channel.

9.3 Critical Habitat Determinations

The only critical habitat present within the Action Area is within the tidal channel (federally designated critical habitat for Green Sturgeon, southern DPS). As Project activities would be short-term and temporary in nature, and not result in permanent effects to or conversion of any PCEs, the Project would have no effect on federally designated critical habitat for Green Sturgeon, southern DPS.

9.4 Essential Fish Habitat Determination

Due to the nature of the Project, there is a potential for adverse effects to EFH from potential sediment or contaminant releases into the tidal channel. However, the Project makes up a very small portion aquatic habitat within the watershed, and activities will be of a short duration. In addition, conservation measures will be implemented to ensure that the Project avoids and/or minimizes adverse effects. The Project would have no effect on EFH.

10. Conclusion

Based on the analysis herein:

- The Project would result in no impacts to terrestrial or aquatic wildlife movement, habitat connectivity, or migration. Construction would be of short-term duration and no permanent barriers would be constructed. Migration routes would not be impacted by operation of the Project. No impacts to aquatic habitat connectivity or migration corridors for fish species is expected.
- The Project does not conflict with any local policies or ordinances and the Project does not overlap any existing HCPs or NCCPs.
- One rare plant, Point Reyes bird's-beak was observed in the Project Area. A pre-construction survey would be implemented to document the location and to avoid this species.
- The SNC within the Project is also an aquatic resource protected under Section 404 of the Clean Water Act. Potential impacts to the SNC (and aquatic resource) will be managed under a Section 404 permit administered by the USACE.
- The majority of aquatic resources within the Project Area will be avoided, however some impacts are anticipated to occur. Most impacts would be temporary, however some minor potential impacts may occur. These potential impacts will be addressed and mitigated for under a Section 404/401 permit administered by the USACE and the Regional Water Quality Control Board, respectively.
- The proposed Project may affect but is not likely to adversely affect federally listed Coho Salmon, Chinook Salmon, Steelhead, Tidewater Goby and Longfin Smelt (under review) associated with a potential (but unlikely) need for relocation during temporary tidal channel, Palco Marsh and Clark Slough dewatering. The proposed Project would have no effect on any other federally listed or candidate species addressed in Section 6. Formal consultation with NMFS and USFWS for federally listed fish species is not expected.
- The proposed Project would have no effect on federally designated critical habitat.
- The proposed Project would have no effect on EFH.
- The proposed Project could, but is unlikely, to result in take of CESA listed Coho Salmon, Summer Run Steelhead, and longfin smelt. Pending review of this BRE, it is anticipated that either a letter of concurrence with the determination of the BRE, or incidental take permitting by CDFW would occur.
- Impacts to Northern Red-legged Frogs would be avoided with implementation of measure 8.1.4.2. described above.

- Impacts to migratory and state special status avian species, protected under the MBTA and FGC would be avoided with implementation of measure 8.1.4.3. described above.

Based on this evaluation, the Project is expected to have a less than significant impact on sensitive biological resources with conservation measures incorporated.

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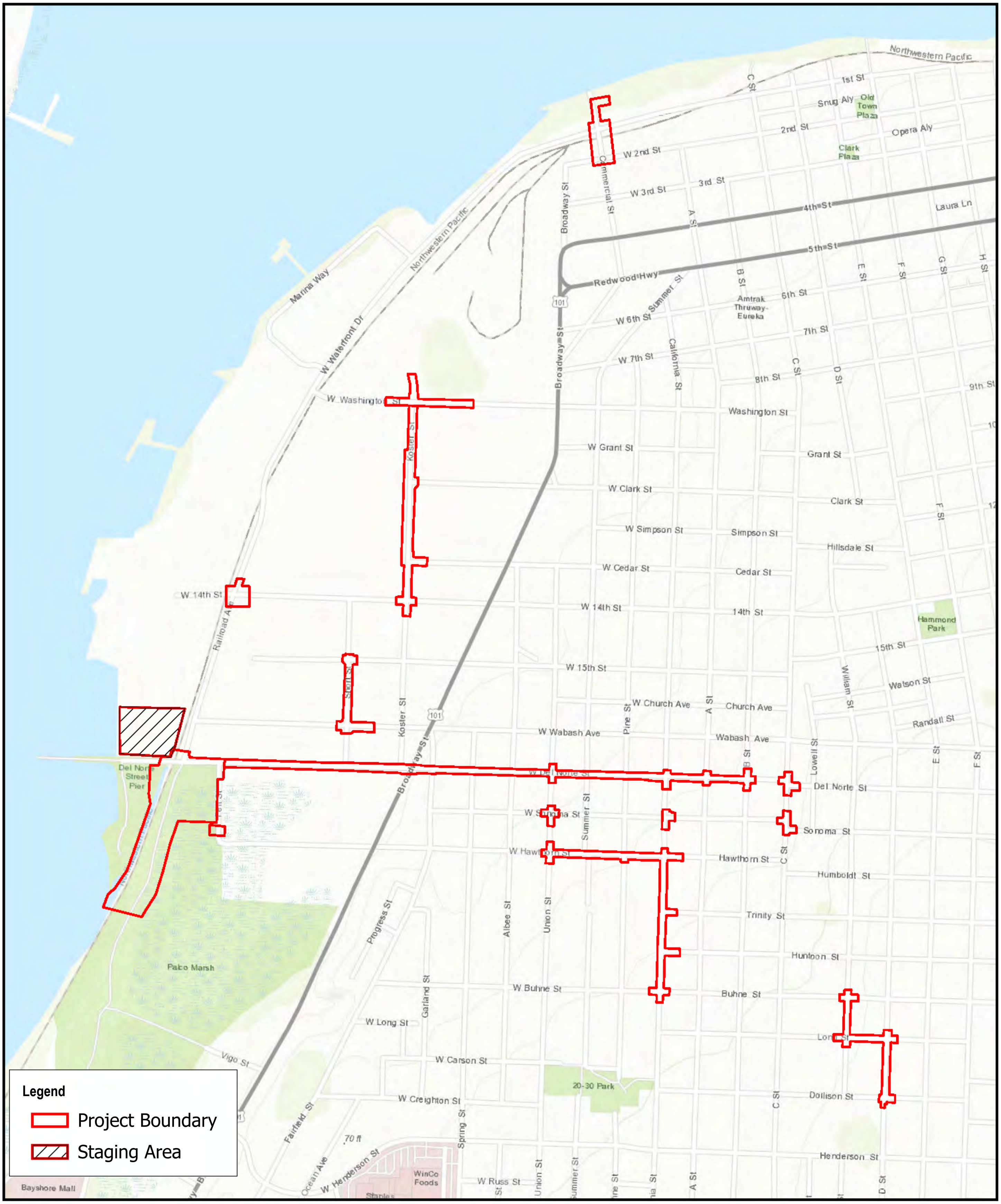
Appendices

Appendix A
Appendices
Figures



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City of Eureka
Flood Reduction and
Seal Level Rise Mitigation Project

Project No. **11220813**
Revision No. **-**
Date **June 2022**

Project Area

FIGURE 1

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City of Eureka
Flood Reduction and
Seal Level Rise Mitigation Project

Botanical and Aquatic Resources Survey Area

Project No. **11220813**
Revision No. **-**
Date **June 2022**

FIGURE 3

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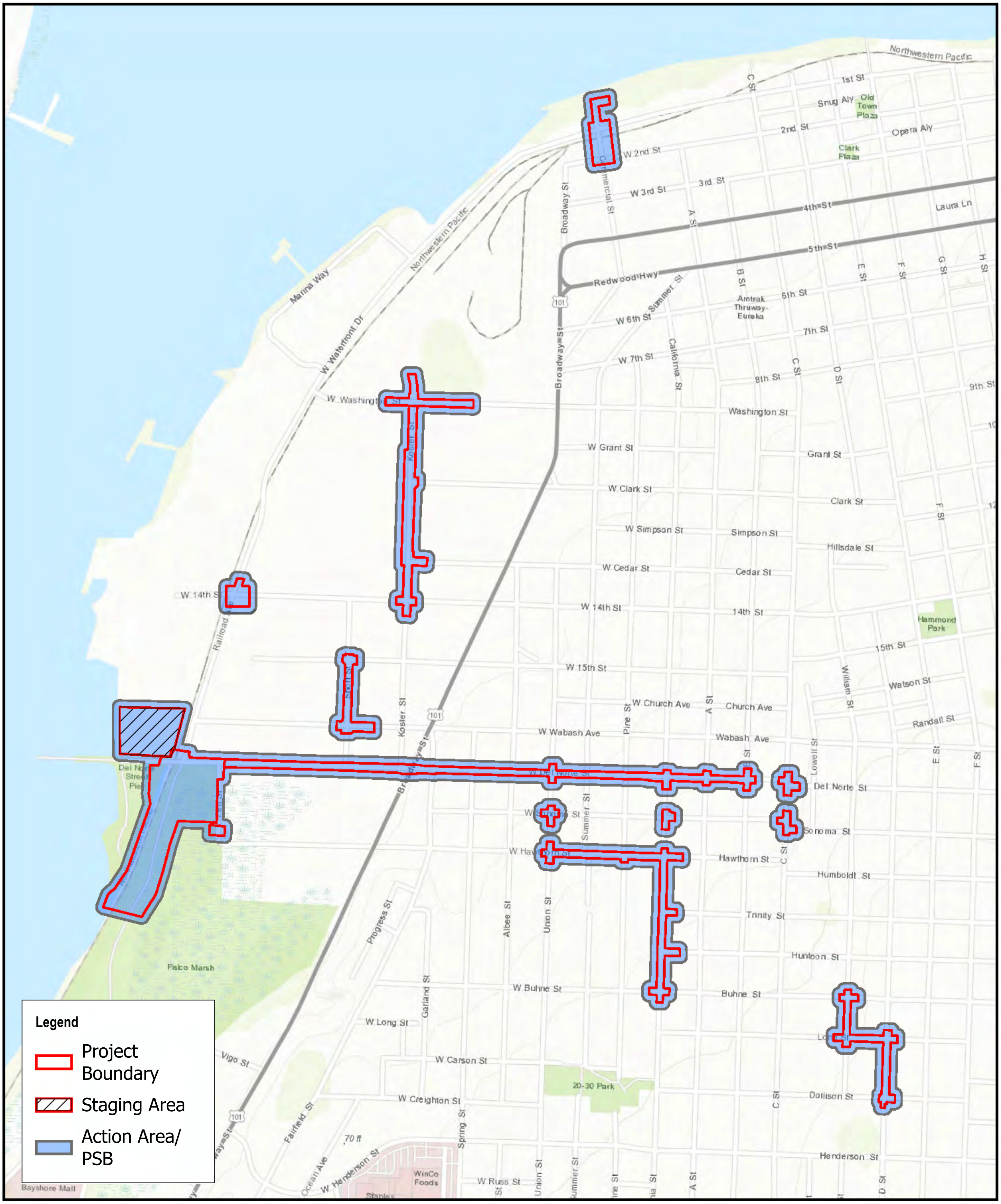

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City of Eureka
Flood Reduction and
Seal Level Rise Mitigation Project

Project No. **11220813**
Revision No. **-**
Date **June 2022**

Action Area/PSB

FIGURE 3

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Data source: World Topographic Map; Bureau of Land Management, Esri, HERE, Garmin, Intermap, USGS, METI/NASA, EPA, USDA. Created by: djones3

Appendix B

CNDDB, CNPS, IPaC, and NMFS Database Search Results

CNDDB Search - Eureka USGS 24K Quadrangle - 07122022											
SciName	**ComName**	**TaxonGroup**	**FedList**	**CalList**	**GRank**	**SRank**	**RPlantRank**	**OthrStatus**	**Habitats**	**GenHab**	**MicroHab**
Abronia umbellata var. breviflora	pink sand-verbena	Dicots	None	None	G4G5T2	S2	1B.1	BLM_S-Sensitive | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Coastal dunes	Coastal dunes and coastal strand.	Foredunes and interdunes with sparse cover. A. umbellata var. breviflora is usually the plant closest to the ocean. 0-75 m.
Acipenser medirostris pop. 1	green sturgeon - southern DPS	Fish	Threatened	None	G2T1	S1		AFS_VU-Vulnerable | IUCN_NT-Near Threatened	Aquatic | Estuary | Marine bay | Sacramento/San Joaquin flowing waters	Spawning site fidelity. Spawns in the Sacramento, Feather and Yuba Rivers. Presence in upper Stanislaus and San Joaquin Rivers may indicate spawning. Non-spawning adults occupy marine/estuarine waters. Delta Estuary is important for rearing juveniles.	Spawning occurs primarily in cool (11-15 C) sections of mainstem rivers in deep pools (8-9 meters) with substrate containing small to medium sized sand, gravel, cobble, or boulder.
Anodonta californiensis	California floater	Mollusks	None	None	G3Q	S2?		USFS_S-Sensitive	Aquatic	Freshwater lakes and slow-moving streams and rivers. Taxonomy under review by specialists.	Generally in shallow water.
Aplodontia rufa humboldtiana	Humboldt mountain beaver	Mammals	None	None	G5TNR	SNR			Coastal scrub | Redwood | Riparian forest	Coast Range in southwestern Del Norte County and northwestern Humboldt County.	Variety of coastal habitats, including coastal scrub, riparian forests, typically with open canopy and thickly vegetated understory.
Ardea alba	great egret	Birds	None	None	G5	S4		CDF_S-Sensitive | IUCN_LC-Least Concern	Brackish marsh | Estuary | Freshwater marsh | Marsh & swamp | Riparian forest | Wetland	Colonial nester in large trees.	Rookery sites located near marshes, tide-flats, irrigated pastures, and margins of rivers and lakes.

Ardea herodias	great blue heron	Birds	None	None	G5	S4		CDF_S-Sensitive | IUCN_LC-Least Concern	Brackish marsh | Estuary | Freshwater marsh | Marsh & swamp | Riparian forest | Wetland	Colonial nester in tall trees, cliffsides, and sequestered spots on marshes.	Rookery sites in close proximity to foraging areas: marshes, lake margins, tide-flats, rivers and streams, wet meadows.
Astragalus pycnostachyus var. pycnostachyus	coastal marsh milk-vetch	Dicots	None	None	G2T2	S2	1B.2	BLM_S-Sensitive | SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden | SB_SBBG-Santa Barbara Botanic Garden | SB_UCBG-UC Botanical Garden at Berkeley	Coastal dunes | Coastal scrub | Marsh & swamp | Wetland	Coastal dunes,marshes and swamps, coastal scrub.	Mesic sites in dunes or along streams or coastal salt marshes. 0-155 m.
Bombus caliginosus	obscure bumble bee	Insects	None	None	G2G3	S1S2		IUCN_VU-Vulnerable		Coastal areas from Santa Barbara County to north to Washington state.	Food plant genera include Baccharis, Cirsium, Lupinus, Lotus, Grindelia and Phacelia.
Bombus occidentalis	western bumble bee	Insects	None	None	G2G3	S1		USFS_S-Sensitive		Once common and widespread, species has declined precipitously from central CA to southern B.C., perhaps from disease.	
Carex arcta	northern clustered sedge	Monocots	None	None	G5	S1	2B.2	IUCN_LC-Least Concern	Bog & fen | North coast coniferous forest | Wetland	Bogs and fens, north coast coniferous forest.	Mesic sites. 60-1405 m.
Carex lyngbyei	Lyngbye's sedge	Monocots	None	None	G5	S3	2B.2	IUCN_LC-Least Concern	Marsh & swamp | Wetland	Marshes and swamps (brackish or freshwater).	0-200 m.
Carex praticola	northern meadow sedge	Monocots	None	None	G5	S2	2B.2		Meadow & seep | Wetland	Meadows and seeps.	Moist to wet meadows. 15-3200 m.

Castilleja ambigua var. humboldtiensis	Humboldt Bay owl's-clover	Dicots	None	None	G4T2	S2	1B.2	BLM_S-Sensitive	Marsh & swamp | Salt marsh | Wetland	Marshes and swamps.	In coastal saltmarsh with Spartina, Distichlis, Salicornia, Jaumea. 0-20 m.
Castilleja litoralis	Oregon coast paintbrush	Dicots	None	None	G3	S3	2B.2		Coastal bluff scrub | Coastal dunes | Coastal scrub	Coastal bluff scrub, coastal dunes, coastal scrub.	Sandy sites. 5-255 m.
Charadrius montanus	mountain plover	Birds	None	None	G3	S2S3		BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_NT-Near Threatened | NABCI_RWL-Red Watch List | USFWS_BCC-Birds of Conservation Concern	Chenopod scrub | Valley & foothill grassland	Short grasslands, freshly plowed fields, newly sprouting grain fields, and sometimes sod farms.	Short vegetation, bare ground, and flat topography. Prefers grazed areas and areas with burrowing rodents.
Charadrius nivosus nivosus	western snowy plover	Birds	Threatened	None	G3T3	S2		CDFW_SSC-Species of Special Concern | NABCI_RWL-Red Watch List	Great Basin standing waters | Sand shore | Wetland	Sandy beaches, salt pond levees and shores of large alkali lakes.	Needs sandy, gravelly or friable soils for nesting.
Chloropyron maritimum ssp. palustre	Point Reyes salty bird's-beak	Dicots	None	None	G4?T2	S2	1B.2	BLM_S-Sensitive	Marsh & swamp | Salt marsh | Wetland	Coastal salt marsh.	Usually in coastal salt marsh with Salicornia, Distichlis, Jaumea, Spartina, etc. 0-115 m.
Cicindela hirticollis gravida	sandy beach tiger beetle	Insects	None	None	G5T2	S2			Coastal dunes	Inhabits areas adjacent to non-brackish water along the coast of California from San Francisco Bay to northern Mexico.	Clean, dry, light-colored sand in the upper zone. Subterranean larvae prefer moist sand not affected by wave action.

Circus hudsonius	northern harrier	Birds	None	None	G5	S3		CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | USFWS_BCC-Birds of Conservation Concern	Coastal scrub | Great Basin grassland | Marsh & swamp | Riparian scrub | Valley & foothill grassland | Wetland	Coastal salt and freshwater marsh. Nest and forage in grasslands, from salt grass in desert sink to mountain cienagas.	Nests on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas.
Collinsia corymbosa	round-headed Chinese-houses	Dicots	None	None	G1	S1	1B.2		Coastal dunes	Coastal dunes.	0-30 m.
Coturnicops noveboracensis	yellow rail	Birds	None	None	G4	S1S2		CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | NABCI_RWL-Red Watch List | USFS_S-Sensitive | USFWS_BCC-Birds of Conservation Concern	Freshwater marsh | Meadow & seep	Summer resident in eastern Sierra Nevada in Mono County.	Freshwater marshlands.
Egretta thula	snowy egret	Birds	None	None	G5	S4		IUCN_LC-Least Concern	Marsh & swamp | Meadow & seep | Riparian forest | Riparian woodland | Wetland	Colonial nester, with nest sites situated in protected beds of dense tules.	Rookery sites situated close to foraging areas: marshes, tidal-flats, streams, wet meadows, and borders of lakes.
Elanus leucurus	white-tailed kite	Birds	None	None	G5	S3S4		BLM_S-Sensitive | CDFW_FP-Fully Protected | IUCN_LC-Least Concern	Cismontane woodland | Marsh & swamp | Riparian woodland | Valley & foothill grassland | Wetland	Rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland.	Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.

Emys marmorata	western pond turtle	Reptiles	None	None	G3G4	S3		BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_VU-Vulnerable | USFS_S-Sensitive	Aquatic | Artificial flowing waters | Klamath/North coast flowing waters | Klamath/North coast standing waters | Marsh & swamp | Sacramento/San Joaquin flowing waters | Sacramento/San Joaquin standing waters | South coast flowing waters | South coast standing waters | Wetland	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, below 6000 ft elevation.	Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.
Entosphenus tridentatus	Pacific lamprey	Fish	None	None	G4	S3		AFS_VU-Vulnerable | BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | USFS_S-Sensitive	Aquatic | Klamath/North coast flowing waters | Sacramento/San Joaquin flowing waters | South coast flowing waters	Found in Pacific Coast streams north of San Luis Obispo County, however regular runs in Santa Clara River. Size of runs is declining.	Swift-current gravel-bottomed areas for spawning with water temps between 12-18 C. Ammocoetes need soft sand or mud.

Erethizon dorsatum	North American porcupine	Mammals	None	None	G5	S3		IUCN_LC-Least Concern	Broadleaved upland forest | Cismontane woodland | Closed-cone coniferous forest | Lower montane coniferous forest | North coast coniferous forest | Upper montane coniferous forest	Forested habitats in the Sierra Nevada, Cascade, and Coast ranges, with scattered observations from forested areas in the Transverse Ranges.	Wide variety of coniferous and mixed woodland habitat.
Erysimum menziesii	Menzies' wallflower	Dicots	Endangered	Endangered	G1	S1	1B.1	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden | SB_UCBG-UC Botanical Garden at Berkeley	Coastal dunes	Coastal dunes.	Localized on dunes and coastal strand. 1-25 m.
Erythronium revolutum	coast fawn lily	Monocots	None	None	G4G5	S3	2B.2		Bog & fen | Broadleaved upland forest | North coast coniferous forest | Wetland	Bogs and fens, broadleafed upland forest, north coast coniferous forest.	Mesic sites; streambanks. 60-1405 m.
Eucyclogobius newberryi	tidewater goby	Fish	Endangered	None	G3	S3		AFS_EN-Endangered | IUCN_VU-Vulnerable	Aquatic | Klamath/North coast flowing waters | Sacramento/ San Joaquin flowing waters | South coast flowing waters	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River.	Found in shallow lagoons and lower stream reaches, they need fairly still but not stagnant water and high oxygen levels.
Falco peregrinus anatum	American peregrine falcon	Birds	Delisted	Delisted	G4T4	S3S4		CDF_S-Sensitive | CDFW_FP-Fully Protected		Near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; also, human-made structures.	Nest consists of a scrape or a depression or ledge in an open site.

Gilia capitata ssp. pacifica	Pacific gilia	Dicots	None	None	G5T3	S2	1B.2		Chaparral | Coastal bluff scrub | Coastal prairie | Valley & foothill grassland	Coastal bluff scrub, chaparral, coastal prairie, valley and foothill grassland.	5-1345 m.
Gilia millefoliata	dark-eyed gilia	Dicots	None	None	G2	S2	1B.2	BLM_S-Sensitive	Coastal dunes	Coastal dunes.	1-60 m.
Hesperevax sparsiflora var. brevifolia	short-leaved evax	Dicots	None	None	G4T3	S3	1B.2	BLM_S-Sensitive	Coastal bluff scrub | Coastal dunes | Coastal prairie	Coastal bluff scrub, coastal dunes, coastal prairie.	Sandy bluffs and flats. 0-640 m.
Lampetra richardsoni	western brook lamprey	Fish	None	None	G4G5	S3S4		CDFW_SSC-Species of Special Concern | USFS_S-Sensitive			
Lasthenia californica ssp. macrantha	perennial goldfields	Dicots	None	None	G3T2	S2	1B.2	BLM_S-Sensitive	Coastal bluff scrub | Coastal dunes | Coastal scrub	Coastal bluff scrub, coastal dunes, coastal scrub.	5-185 m.
Lathyrus japonicus	seaside pea	Dicots	None	None	G5	S2	2B.1	IUCN_LC-Least Concern	Coastal dunes	Coastal dunes.	3-65 m.
Lathyrus palustris	marsh pea	Dicots	None	None	G5	S2	2B.2		Bog & fen | Coastal prairie | Coastal scrub | Lower montane coniferous forest | Marsh & swamp | North coast coniferous forest | Wetland	Bogs and fens, lower montane coniferous forest, marshes and swamps, north coast coniferous forest, coastal prairie, coastal scrub.	Moist coastal areas. 2-140 m.

Layia carnosa	beach layia	Dicots	Threatened	Endangered	G2	S2	1B.1	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden | SB_SBBG-Santa Barbara Botanic Garden	Coastal dunes | Coastal scrub	Coastal dunes, coastal scrub.	On sparsely vegetated, semi-stabilized dunes, usually behind foredunes. 3-30 m.
Lilium occidentale	western lily	Monocots	Endangered	Endangered	G1	S1	1B.1	SB_BerrySB-Berry Seed Bank	Bog & fen | Coastal bluff scrub | Coastal prairie | Coastal scrub | Freshwater marsh | Marsh & swamp | North coast coniferous forest | Wetland	Coastal scrub, freshwater marsh, bogs and fens, coastal bluff scrub, coastal prairie, north coast coniferous forest, marshes and swamps.	Well-drained, old beach washes overlain with wind-blown alluvium and organic topsoil; usually near margins of Sitka spruce. 3-110 m.
Monotropa uniflora	ghost-pipe	Dicots	None	None	G5	S2	2B.2		Broadleaved upland forest | North coast coniferous forest	Broadleafed upland forest, north coast coniferous forest.	Often under redwoods or western hemlock. 15-855 m.
Montia howellii	Howell's montia	Dicots	None	None	G3G4	S2	2B.2		Meadow & seep | North coast coniferous forest | Vernal pool | Wetland	Meadows and seeps, north coast coniferous forest, vernal pools.	Vernally wet sites; often on compacted soil. 10-1215 m.
Northern Coastal Salt Marsh	Northern Coastal Salt Marsh	Marsh	None	None	G3	S3.2			Marsh & swamp | Wetland		
Nycticorax nycticorax	black-crowned night heron	Birds	None	None	G5	S4		IUCN_LC-Least Concern	Marsh & swamp | Riparian forest | Riparian woodland | Wetland	Colonial nester, usually in trees, occasionally in tule patches.	Rookery sites located adjacent to foraging areas: lake margins, mud-bordered bays, marshy spots.

Oenothera wolfii	Wolf's evening-primrose	Dicots	None	None	G2	S1	1B.1	SB_BerrySB-Berry Seed Bank	Coastal bluff scrub | Coastal dunes | Coastal prairie	Coastal bluff scrub, coastal dunes, coastal prairie, lower montane coniferous forest.	Sandy substrates; usually mesic sites. 0-125 m.
Oncorhynchus clarkii clarkii	coast cutthroat trout	Fish	None	None	G5T4	S3		AFS_VU-Vulnerable | CDFW_SSC-Species of Special Concern | USFS_S-Sensitive	Aquatic | Klamath/North coast flowing waters	Small coastal streams from the Eel River to the Oregon border.	Small, low gradient coastal streams and estuaries. Needs shaded streams with water temperatures <18C, and small gravel for spawning.
Oncorhynchus kisutch pop. 2	coho salmon - southern Oregon / northern California ESU	Fish	Threatened	Threatened	G5T2Q	S2		AFS_TH-Threatened	Aquatic | Klamath/North coast flowing waters | Sacramento/ San Joaquin flowing waters	Federal listing refers to populations between Cape Blanco, Oregon and Punta Gorda, Humboldt County, California.	State listing refers to populations between the Oregon border and Punta Gorda, California.
Oncorhynchus mykiss irideus pop. 16	steelhead - northern California DPS	Fish	Threatened	None	G5T2T3Q	S2S3		AFS_TH-Threatened	Aquatic | Klamath/North coast flowing waters	Coastal basins from Redwood Creek south to the Gualala River, inclusive.	
Pandion haliaetus	osprey	Birds	None	None	G5	S4		CDF_S-Sensitive | CDFW_WL-Watch List | IUCN_LC-Least Concern	Riparian forest	Ocean shore, bays, freshwater lakes, and larger streams.	Large nests built in tree-tops within 15 miles of a good fish-producing body of water.
Rallus obsoletus obsoletus	California Ridgway's rail	Birds	Endangered	Endangered	G3T1	S1		CDFW_FP-Fully Protected | NABCI_RWL-Red Watch List	Brackish marsh | Marsh & swamp | Salt marsh | Wetland	Salt water and brackish marshes traversed by tidal sloughs in the vicinity of San Francisco Bay.	Associated with abundant growths of pickleweed, but feeds away from cover on invertebrates from mud-bottomed sloughs.
Rana aurora	northern red-legged frog	Amphibians	None	None	G4	S3		CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | USFS_S-Sensitive	Klamath/North coast flowing waters | Riparian forest | Riparian woodland	Humid forests, woodlands, grasslands, and streamsides in northwestern California, usually near dense riparian cover.	Generally near permanent water, but can be found far from water, in damp woods and meadows, during non-breeding season.

Riparia riparia	bank swallow	Birds	None	Threatened	G5	S2		BLM_S-Sensitive | IUCN_LC-Least Concern	Riparian scrub | Riparian woodland	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert.	Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole.
Sidalcea malachroides	maple-leaved checkerbloom	Dicots	None	None	G3	S3	4.2		Broadleaved upland forest | Coastal prairie | Coastal scrub | North coast coniferous forest | Riparian forest	Broadleafed upland forest, coastal prairie, coastal scrub, north coast coniferous forest, riparian forest.	Woodlands and clearings near coast; often in disturbed areas. 4-765 m.
Sidalcea malviflora ssp. patula	Siskiyou checkerbloom	Dicots	None	None	G5T2	S2	1B.2		Coastal bluff scrub | Coastal prairie | North coast coniferous forest	Coastal bluff scrub, coastal prairie, north coast coniferous forest.	Open coastal forest; roadcuts. 5-1255 m.
Sidalcea oregana ssp. eximia	coast checkerbloom	Dicots	None	None	G5T1	S1	1B.2		Lower montane coniferous forest | Meadow & seep | North coast coniferous forest | Wetland	Meadows and seeps, north coast coniferous forest, lower montane coniferous forest.	Near meadows, in gravelly soil. 5-1805 m.
Silene scouleri ssp. scouleri	Scouler's catchfly	Dicots	None	None	G5T4T5	S2S3	2B.2		Coastal bluff scrub | Coastal prairie | Valley & foothill grassland	Coastal bluff scrub, coastal prairie, valley and foothill grassland.	5-315 m.
Spergularia canadensis var. occidentalis	western sand-spurrey	Dicots	None	None	G5T4	S1	2B.1		Marsh & swamp | Wetland	Marshes and swamps (coastal salt marshes).	0-3 m.
Spirinchus thaleichthys	longfin smelt	Fish	Candidate	Threatened	G5	S1			Aquatic | Estuary	Euryhaline, nektonic and anadromous. Found in open waters of estuaries, mostly in middle or bottom of water column.	Prefer salinities of 15-30 ppt, but can be found in completely freshwater to almost pure seawater.

Sulcaria spiralifera	twisted horsehair lichen	Lichens	None	None	G3G4	S2	1B.2	BLM_S-Sensitive	Coastal dunes | North coast coniferous forest	North Coast coniferous forest (immediate coast), coastal dunes.	Usually on conifers. 0-90 m.
Thaleichthys pacificus	eulachon	Fish	Threatened	None	G5	S2			Aquatic | Klamath/North coast flowing waters	Found in Klamath River, Mad River, Redwood Creek, and in small numbers in Smith River and Humboldt Bay tributaries.	Spawn in lower reaches of coastal rivers with moderate water velocities and bottom of pea-sized gravel, sand, and woody debris.
Viola palustris	alpine marsh violet	Dicots	None	None	G5	S1S2	2B.2		Bog & fen | Coastal scrub | Wetland	Coastal scrub, bogs and fens.	Swampy, shrubby places in coastal scrub or coastal bogs. 0-150 m.

CNPS Search - Eureka USGS 24K Quadrangle - 07122022																				
ScientificName	CommonName	Family	Lifeform	CRPR	GRank	SRank	CESA	FESA	BloomingPeriod	Habitat	Elevation Low_m	Elevation Low_ft	Elevation High_m	Elevation High_ft	CAEndemic	Notes	ElementCode	USDAPlantsSymbol	DateAdded	LastUpdate
Abronia umbellata var. breviflora	pink sand-verbena	Nyctaginaceae	annual herb	1B.1	G4G5T2	S2	None	None	Jun-Oct	Coastal dunes	0	0	10	35	FALSE	Most occurrences have few plants. Threatened by vehicles, non-native plants, and foot traffic. State-listed as Endangered in OR.	PDNYC010N4		1/1/1988 0:00	3/1/2022 0:00
Carex praticola	northern meadow sedge	Cyperaceae	perennial herb	2B.2	G5	S2	None	None	May-Jul	Meadows and seeps	0	0	3200	10500	FALSE	On review list in OR.	PMCYP03B20	CAPR7	1/1/1984 0:00	5/26/2021 0:00
Chloropyron maritimum ssp. palustre	Point Reyes salty bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	1B.2	G4?T2	S2	None	None	Jun-Oct	Marshes and swamps	0	0	10	35	FALSE	Once rather common in proper habitat; now greatly reduced by development. Also threatened by foot traffic, non-native plants, hydrological alterations, cattle grazing and trampling. State listed as Endangered in OR. See Proceedings of the California Academy of Science 1:61 (1855) for original description, Brittonia 25:135-158 (1973) for taxonomic treatment, and Madrono 41(4):316-327 (1994) for ecological discussion.	PDSCR0J0C3		1/1/1974 0:00	5/26/2021 0:00
Astragalus rattanii var. rattanii	Rattan's milk-vetch	Fabaceae	perennial herb	4.3	G4T4	S4	None	None	Apr-Jul	Chaparral, Cismontane woodland, Lower montane coniferous forest	30	100	825	2705	TRUE	See Systematic Botany 17(3):367-379 (1992) for distributional information.	PDFAB0F7E2	ASRAR3	1/1/1988 0:00	6/8/2022 0:00
Eleocharis parvula	small spikerush	Cyperaceae	perennial herb	4.3	G5	S3	None	None	(Apr)Jun-Aug(Sep)	Marshes and swamps	1	5	3020	9910	FALSE	See Wasmann Journal of Biology 33(1-2):98 (1975) for discussion of CA distribution.	PMCYP091G0	ELPA5	1/1/1980 0:00	5/26/2021 0:00
Monotropa uniflora	ghost-pipe	Ericaceae	perennial herb (achlorophyllous)	2B.2	G5	S2	None	None	Jun-Aug(Sep)	Broadleafed upland forest, North Coast coniferous forest	10	35	550	1805	FALSE		PDMON03030	MOUN3	1/1/1974 0:00	4/5/2022 0:00
Lathyrus glandulosus	sticky pea	Fabaceae	perennial rhizomatous herb	4.3	G3	S3	None	None	Apr-Jun	Cismontane woodland	300	985	800	2625	TRUE	See Madrono 33(2):136-143 (1986) for original description.	PDFAB251A0	LAGL8	1/1/1988 0:00	1/5/2022 0:00
Layia carnosa	beach layia	Asteraceae	annual herb	1B.1	G2	S2	CE	FT	Mar-Jul	Coastal dunes, Coastal scrub	0	0	60	195	FALSE	Reclassified from federally endangered to threatened on 2022-03-31 due to substantial improvements in the species' overall status since its original listing as endangered in 1992.	PDAST5N010	LACA4	1/1/1988 0:00	6/8/2022 0:00
Lilium occidentale	western lily	Liliaceae	perennial bulbiferous herb	1B.1	G1	S1	CE	FE	Jun-Jul	Bogs and fens, Coastal bluff scrub, Coastal prairie, Coastal scrub, Marshes and swamps, North Coast coniferous forest	2	5	185	605	FALSE	Most CA occurrences under DFG management or voluntarily protected by landowners. Threatened by development, herbivory, inappropriate grazing, vegetation succession, and horticultural collecting. State-listed as Endangered in OR. See Erythea 5:103-105 (1897) for original description.	PMLIL1A0G0	LIOC2	1/1/1974 0:00	2/1/2022 0:00
Listera cordata	heart-leaved twayblade	Orchidaceae	perennial herb	4.2	G5	S4	None	None	Feb-Jul	Bogs and fens, Lower montane coniferous forest, North Coast coniferous forest	5	15	1370	4495	FALSE	Easily overlooked. Threatened by grazing, logging, and road maintenance. Includes L. cordata var. nephrophylla. See Fremontia 17(3):26-27 (1989) and The Wild Orchids of California, p. 95-98 (1995) by R. Coleman for species accounts.	PMORC1N060	LICO6	1/1/1974 0:00	9/27/2021 0:00
Lycopodium clavatum	running-pine	Lycopodiaceae	perennial rhizomatous herb	4.1	G5	S3	None	None	Jun-Aug(Sep)	Lower montane coniferous forest, Marshes and swamps, North Coast coniferous forest	45	150	1225	4020	FALSE		PPLYC01080	LYCL	1/1/1974 0:00	4/5/2022 0:00
Oenothera wolfii	Wolf's evening-primrose	Onagraceae	perennial herb	1B.1	G2	S1	None	None	May-Oct	Coastal bluff scrub, Coastal dunes, Coastal prairie, Lower montane coniferous forest	3	10	800	2625	FALSE		PDONA0C1K0	OEWO	1/1/1980 0:00	4/5/2022 0:00

Castilleja ambigua var. humboldtiensis	Humboldt Bay owl's-clover	Orobanchaceae	annual herb (hemiparasitic)	1B.2	G4T2	S2	None	None	Apr-Aug	Marshes and swamps	0	0	3	10	TRUE	Threatened by coastal development and non-native plants. See C. ambigua ssp. humboldtiensis in TJM 2. See Proceedings of the American Academy of Arts and Sciences IV 16:536 (1927) for original description, Phytologia 90(1):63-82 (2008) for revised nomenclature, and Madrono 45(4):326 for distribution information.	PDSCR0D402		1/1/1974 0:00	5/26/2021 0:00
Angelica lucida	sea-watch	Apiaceae	perennial herb	4.2	G5	S3	None	None	Apr-Sep	Coastal bluff scrub, Coastal dunes, Coastal scrub, Marshes and swamps	0	0	150	490	FALSE	Possibly threatened by non-native plants.	PDAPI070G0	ANLU	1/1/2001 0:00	2/1/2022 0:00
Lasthenia californica ssp. macrantha	perennial goldfields	Asteraceae	perennial herb	1B.2	G3T2	S2	None	None	Jan-Nov	Coastal bluff scrub, Coastal dunes, Coastal scrub	5	15	520	1705	TRUE	Threatened by competition from non-native plants and recreational activities. Potentially threatened by trail construction and foot traffic. See Report of the Pacific Railroad Expedition 4:106 (1857) for original description, University of California Publications in Botany 40:59-62 (1966) for taxonomic treatment, and Madrono 48(3): 208 (2001) for revised nomenclature.	PDAST5L0C5	LACAM3	1/1/2001 0:00	1/5/2022 0:00
Lathyrus japonicus	seaside pea	Fabaceae	perennial rhizomatous herb	2B.1	G5	S2	None	None	May-Aug	Coastal dunes	1	5	30	100	FALSE	Threatened by non-native plants and vehicles, and possibly threatened by trail maintenance and foot traffic.	PDFAB250C0	LAJA	1/1/2001 0:00	7/14/2021 0:00
Erythronium revolutum	coast fawn lily	Liliaceae	perennial bulbiferous herb	2B.2	G4G5	S3	None	None	Mar-Jul(Aug)	Bogs and fens, Broadleafed upland forest, North Coast coniferous forest	0	0	1600	5250	FALSE	Threatened by logging, non-native plants, vehicles, and road maintenance. Possibly threatened by grazing. On watch list in OR, and state-listed as Sensitive in WA. See Madrono 3(2):93-99 (1935) for taxonomic treatment.	PMLIL0U0F0	ERRE5	1/1/2001 0:00	12/9/2021 0:00
Pityopus californicus	California pinefoot	Ericaceae	perennial herb (achlorophyllous)	4.2	G4G5	S4	None	None	(Mar-Apr)May-Aug	Broadleafed upland forest, Lower montane coniferous forest, North Coast coniferous forest, Upper montane coniferous forest	15	50	2225	7300	FALSE	Threatened by logging. State-listed as Sensitive in WA. SeeBulletin of the Torrey Botanical Club 29(2):75 (1902) for original description, and Madrono 3:155 (1935) for revised nomenclature.	PDMON05010		1/1/1974 0:00	6/8/2022 0:00
Pleuropogon refractus	nodding semaphore grass	Poaceae	perennial rhizomatous herb	4.2	G4	S4	None	None	(Mar)Apr-Aug	Lower montane coniferous forest, Meadows and seeps, North Coast coniferous forest, Riparian forest	0	0	1600	5250	FALSE	Threatened by roadside mowing, logging and associated road usage.	PMPOA4Y080	PLRE2	1/1/1974 0:00	6/8/2022 0:00
Puccinellia pumila	dwarf alkali grass	Poaceae	perennial herb	2B.2	G4?	SH	None	None	Jul	Marshes and swamps	1	5	10	35	FALSE	Known in CA from only two occurrences. Need current information on distribution and endangerment. On review list in OR.	PMPOA531L0	PUPU3	1/1/1988 0:00	5/26/2021 0:00
Ribes laxiflorum	trailing black currant	Grossulariaceae	perennial deciduous shrub	4.3	G5?	S3	None	None	Mar-Jul(Aug)	North Coast coniferous forest	5	15	1395	4575	FALSE		PDGRO020V0	RILA3	1/1/1974 0:00	6/8/2022 0:00
Carex leptalea	bristle-stalked sedge	Cyperaceae	perennial rhizomatous herb	2B.2	G5	S1	None	None	Mar-Jul	Bogs and fens, Marshes and swamps, Meadows and seeps	0	0	700	2295	FALSE	Threatened by hydrological alterations, logging, and non-native plants. Apparently extirpated in MRN Co. by wetland conversion. Sensitive in ID.	PMCYP037E0	CALE10	1/1/1994 0:00	7/14/2021 0:00
Collinsia corymbosa	round-headed Chinese-houses	Plantaginaceae	annual herb	1B.2	G1	S1	None	None	Apr-Jun	Coastal dunes	0	0	20	65	TRUE	Scattered distribution. Need quads for HUM Co. and for "Russian colony" (SON Co.). May intergrade with C. bartsiifolia var. bartsiifolia. Possibly threatened by foot traffic.	PDSCR0H060	COCO2	1/1/1994 0:00	5/26/2021 0:00

Hesperevax sparsiflora var. brevifolia	short-leaved evax	Asteraceae	annual herb	1B.2	G4T3	S3	None	None	Mar-Jun	Coastal bluff scrub, Coastal dunes, Coastal prairie	0	0	215	705	FALSE	Threatened by development, competition with non-native plants, foot traffic, and recreational activities. Potentially threatened by trail construction. May intergrade with var. sparsiflora in the San Francisco Bay area. On review list in OR. See Synoptical Flora of North America 1(2):229 (1884) for original description, and Systematic Botany 17:293-310 (1992) for revised nomenclature.	PDASTE5011	HESPB	1/1/1994 0:00	1/5/2022 0:00
Lathyrus palustris	marsh pea	Fabaceae	perennial herb	2B.2	G5	S2	None	None	Mar-Aug	Bogs and fens, Coastal prairie, Coastal scrub, Lower montane coniferous forest, Marshes and swamps, North Coast coniferous forest	1	5	100	330	FALSE	See University of Washington Publications in Botany 15:13 (1952) for taxonomic treatment.	PDFAB250P0	LAPA4	1/1/1994 0:00	1/5/2022 0:00
Lilium kelloggii	Kellogg's lily	Liliaceae	perennial bulbiferous herb	4.3	G3	S3	None	None	May-Aug	Lower montane coniferous forest, North Coast coniferous forest	3	10	1300	4265	FALSE	Endangered in OR.	PMLIL1A0A0	LIKE2	1/1/1974 0:00	3/1/2022 0:00
Montia howellii	Howell's montia	Montiaceae	annual herb	2B.2	G3G4	S2	None	None	(Feb)Mar-May	Meadows and seeps, North Coast coniferous forest, Vernal pools	0	0	835	2740	FALSE	Rediscovered in CA in 1999 by Clare Golec. Did plant occur in DNT Co.? Candidate for state listing in OR.	PDPOR05070	MOHO	1/1/1994 0:00	4/5/2022 0:00
Sidalcea malachroides	maple-leaved checkerbloom	Malvaceae	perennial herb	4.2	G3	S3	None	None	(Mar)Apr-Aug	Broadleafed upland forest, Coastal prairie, Coastal scrub, North Coast coniferous forest, Riparian woodland	0	0	730	2395	FALSE	SCL Co. (427A) occurrence based on old specimen, needs confirmation. Threatened by logging and associated road usage, non-native plants, competition, low reproduction, road maintenance, and development. Endangered in OR. See University of Washington Publications in Biology 18:1-96 (1957) for taxonomic treatment.	PDMAL110E0	SIMA	1/1/1994 0:00	6/8/2022 0:00
Sidalcea malviflora ssp. patula	Siskiyou checkerbloom	Malvaceae	perennial rhizomatous herb	1B.2	G5T2	S2	None	None	(Mar)May-Aug	Coastal bluff scrub, Coastal prairie, North Coast coniferous forest	15	50	1230	4035	FALSE	Threatened by road widening and non-native plants. Possibly threatened by logging, grazing, and trampling.	PDMAL110F9	SIMAP	1/1/1994 0:00	7/11/2022 0:00
Sidalcea oregana ssp. eximia	coast checkerbloom	Malvaceae	perennial herb	1B.2	G5T1	S1	None	None	Jun-Aug	Lower montane coniferous forest, Meadows and seeps, North Coast coniferous forest	5	15	1340	4395	TRUE	Known from approximately ten occurrences. Possibly threatened by trampling. Intergrades with sspp. oregana and spicata. See University of Washington Publications in Biology 18:1-96 (1957) for taxonomic treatment.	PDMAL110K9	SIORE	1/1/1994 0:00	5/26/2021 0:00
Viola palustris	alpine marsh violet	Violaceae	perennial rhizomatous herb	2B.2	G5	S1S2	None	None	Mar-Aug	Bogs and fens, Coastal scrub	0	0	150	490	FALSE	Often overlooked and rarely collected. Possibly threathened by habitat alteration. See Madrono 17(6):173-197 (1964) for taxonomic treatment.	PDVIO041G0	VIPA4	1/1/1994 0:00	5/26/2021 0:00
Astragalus pycnostachyus var. pycnostachyus	coastal marsh milk-vetch	Fabaceae	perennial herb	1B.2	G2T2	S2	None	None	(Apr)Jun-Oct	Coastal dunes, Coastal scrub, Marshes and swamps	0	0	30	100	TRUE	Possibly threatened by cattle trampling, erosion, and competition. See Proceedings of the American Academy of Arts and Sciences 6:526 (1865) for original description, and Memoirs of the New York Botanical Garden 13:811-813 (1964) for taxonomic treatment.	PDFAB0F7B2	ASPYP	1/1/2001 0:00	5/26/2021 0:00
Carex arcta	northern clustered sedge	Cyperaceae	perennial herb	2B.2	G5	S1	None	None	Jun-Sep	Bogs and fens, North Coast coniferous forest	60	195	1400	4595	FALSE	Possibly threatened by logging. Does plant occur in MEN Co.?	PMCYP030X0	CAAR2	1/1/2001 0:00	7/14/2021 0:00
Carex lyngbyei	Lyngbye's sedge	Cyperaceae	perennial rhizomatous herb	2B.2	G5	S3	None	None	Apr-Aug	Marshes and swamps	0	0	10	35	FALSE	Possibly threatened by grazing, non-native plants, and habitat disturbance.	PMCYP037Y0	CALY3	1/1/2001 0:00	7/14/2021 0:00

Castilleja litoralis	Oregon coast paintbrush	Orobanchaceae	perennial herb (hemiparasitic)	2B.2	G3	S3	None	None	Jun	Coastal bluff scrub, Coastal dunes, Coastal scrub	15	50	100	330	FALSE	Threatened by development, recreational activities, and erosion. See C. affinis ssp. litoralis in TJM 2. See Proceedings of the Academy of Natural Sciences of Philadelphia 99:183 (1947) for original description, and Novon 2(3):185 (1992) for alternative nomenclature.	PDSCR0D012		1/1/2001 0:00	10/4/2021 0:00
Gilia capitata ssp. pacifica	Pacific gilia	Polemoniaceae	annual herb	1B.2	G5T3	S2	None	None	Apr-Aug	Chaparral, Coastal bluff scrub, Coastal prairie, Valley and foothill grassland	5	15	1665	5465	FALSE		PDPLM040B6	GICAP	1/1/2001 0:00	3/1/2022 0:00
Gilia millefoliata	dark-eyed gilia	Polemoniaceae	annual herb	1B.2	G2	S2	None	None	Apr-Jul	Coastal dunes	2	5	30	100	FALSE	Threatened by development, vehicles, foot traffic, grazing, and non-native plants. Endangered in OR. See Aliso 3(1):33 (1954) for taxonomic treatment.	PDPLM04130	GIMI	1/1/2001 0:00	1/5/2022 0:00
Glehnia littoralis ssp. leiocarpa	American glehnia	Apiaceae	perennial herb	4.2	G5T5	S2S3	None	None	May-Aug	Coastal dunes	0	0	20	65	FALSE	Threatened by non-native plants and vehicles. See Annals of the Missouri Botanical Garden 15:95 (1928) for original description, and Flora of Alaska and Yukon 7:1180 (1947) for revised nomenclature.	PDAPI13011	GLLIL	1/1/2001 0:00	5/26/2021 0:00
Mitellastra caulescens	leafy-stemmed mitrewort	Saxifragaceae	perennial rhizomatous herb	4.2	G5	S4	None	None	(Mar)Apr-Oct	Broadleafed upland forest, Lower montane coniferous forest, Meadows and seeps, North Coast coniferous forest	5	15	1700	5580	FALSE	Threatened by logging and road maintenance.	PDSAX0N020		1/1/2001 0:00	3/1/2022 0:00
Spergularia canadensis var. occidentalis	western sand-spurrey	Caryophyllaceae	annual herb	2B.1	G5T4	S1	None	None	Jun-Aug	Marshes and swamps	0	0	3	10	FALSE	Known in CA only from Humboldt Bay. Threatened by development. See Rhodora 42:116 (1940) for original description.	PDCAR0W032	SPCAO	1/1/2001 0:00	5/26/2021 0:00
Fissidens pauperculus	minute pocket moss	Fissidentaceae	moss	1B.2	G3?	S2	None	None		North Coast coniferous forest	10	35	1024	3360	FALSE	See Erythea 2:97-101 (1894) for original description.	NBMUS2W0U0	FIPA5	1/1/2001 0:00	5/26/2021 0:00
Trichodon cylindricus	cylindrical trichodon	Ditrichaceae	moss	2B.2	G4G5	S2	None	None		Broadleafed upland forest, Meadows and seeps, Upper montane coniferous forest	50	165	2002	6570	FALSE	Threatened by logging, road maintenance. See Spec. Musc. p. 107 (1801) for original description, and Corroll p. 36 (1856) for revised nomenclature.	NBMUS7N020	TRCY6	1/1/2001 0:00	6/8/2022 0:00
Hosackia gracilis	harlequin lotus	Fabaceae	perennial rhizomatous herb	4.2	G3G4	S3	None	None	Mar-Jul	Broadleafed upland forest, Cismontane woodland, Closed-cone coniferous forest, Coastal bluff scrub, Coastal prairie, Coastal scrub, Marshes and swamps, Meadows and seeps, North Coast coniferous forest, Valley and foothill grassland	0	0	700	2295	FALSE	Designated as Endangered in Canada. Threatened by development, grazing, feral pigs, habitat alteration, and competition. Thought to be a larval food plant of the Federally Endangered lotis blue butterfly (Lycaeides argyrognomon ssp. lotis).	PDFAB2A0D0		1/1/2004 0:00	1/5/2022 0:00
Cardamine angulata	seaside bittercress	Brassicaceae	perennial herb	2B.2	G4G5	S3	None	None	(Jan)Mar-Jul	Lower montane coniferous forest, North Coast coniferous forest	15	50	915	3000	FALSE	Many occurrences are historical; need field surveys. Possibly threatened by foot traffic, and road maintenance. See Flora Boreali-Americana 1(1):44-45 (1829) for original description.	PDBRA0K010	CAAN5	4/10/2012 0:00	10/4/2021 0:00

Erysimum menziesii	Menzies' wallflower	Brassicaceae	perennial herb	1B.1	G1	S1	CE	FE	Mar-Sep	Coastal dunes	0	0	35	115	TRUE	Plants treated as sspp. eurekense (known only from the Humboldt Bay area; threatened by development, vehicles, and non-native plants), menziesii (nearly extirpated on the Monterey Peninsula; seriously threatened by development, vehicles, deer browsing, and non-native plants), and yadonii (known only from near Marina on Monterey Bay; threatened by development and sand mining) are not validly published; see these names in TJM (1993). See Zoe 5(6-8):103 (1901) for original description.	PDBRA160R0	ERME5	1/1/1974 0:00	5/26/2021 0:00
Sulcaria spiralifera	twisted horsehair lichen	Parmeliaceae	fruticose lichen (epiphytic)	1B.2	G3G4	S2	None	None		Coastal dunes, North Coast coniferous forest	0	0	90	295	FALSE	Largest known population in CA is on the Samoa Peninsula in HUM Co. Possibly threatened by coastal development, air pollution, and climate change. Usually on Picea sitchensis, Pinus contorta var. contorta, Pseudotsuga menziesii, Abies grandis, and Tsuga heterophylla. Includes Bryoria pseudocapillaris, which was previously CRPR 3.2. Similar to S. badia. See Bulletin of the California Lichen Society 15(1):4-6 (2008) for CALS Conservation Committee sponsorship, and The Lichenologist 46(6):737-752 (2014) for taxonomic treatment. CALS: Sulcaria spiralifera.	NLT0042560		3/1/2014 0:00	10/8/2021 0:00
Usnea longissima	Methuselah's beard lichen	Parmeliaceae	fruticose lichen (epiphytic)	4.2	G4	S4	None	None		Broadleafed upland forest, North Coast coniferous forest	50	165	1460	4790	FALSE	Threatened by development, road maintenance, and logging. See CALS Conservation Committee sponsorship by E. Peterson (2005) for additional information.	NLLEC5P420	USLO50	3/1/2014 0:00	10/8/2021 0:00
Chrysosplenium glechomifolium	Pacific golden saxifrage	Saxifragaceae	perennial herb	4.3	G5?	S3	None	None	Feb-Jun	North Coast coniferous forest, Riparian forest	10	35	220	720	FALSE	See A Flora of North America: containing... 1(4):589-590 (1840) by J. Torrey and A. Gray for original description.	PDSAX07020	CHGL5	10/15/2015 0:00	11/5/2021 0:00
Silene scouleri ssp. scouleri	Scouler's catchfly	Caryophyllaceae	perennial herb	2B.2	G5T4T5	S2S3	None	None	(Mar-May)Jun-Aug(Sep)	Coastal bluff scrub, Coastal prairie, Valley and foothill grassland	0	0	600	1970	FALSE	Potentially threatened by habitat loss, foot traffic, and recreational activities. Possibly threatened by herbivory. See Flora Boreali-Americana 1(2):88-89 (1830) for original description, and Revision of the North American Silene 26 (1947) for taxonomic treatment.	PDCAR0U1MC	SISCS2	12/13/2017 0:00	5/26/2021 0:00

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Arcata Fish And Wildlife Office
1655 Heindon Road
Arcata, CA 95521-4573
Phone: (707) 822-7201 Fax: (707) 822-8411

In Reply Refer To: July 13, 2022
Project Code: 2022-0062998
Project Name: Eureka Flood Reduction and Sea Level Rise Resiliency Project

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/birds/policies-and-regulations.php.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Arcata Fish And Wildlife Office
1655 Heindon Road
Arcata, CA 95521-4573
(707) 822-7201

Project Summary

Project Code: 2022-0062998
Event Code: None
Project Name: Eureka Flood Reduction and Sea Level Rise Resiliency Project
Project Type: Flooding
Project Description: The City of Eureka proposes this Project within urbanized coastal areas to reduce flooding, increase sea level rise resiliency, and improve water quality in Humboldt Bay. The Project improves the capacity and conveyance of the storm drain network to reduce flooding in combination with new tide and flap gates to reduce flood impacts from sea level rise. Low Impact Development (LID) features (e.g., rain gardens) will be placed along, or upstream of storm drain improvements and trash capture devices will be installed. Water quality benefits will be achieved by reductions in peak flows and runoff volumes that can create erosion and carry sediment loads to Humboldt Bay, and the LID features will provide additional pollutant removal from urban runoff. The trash capture devices will also reduce pollutants entering the Bay and help ensure that the system's outfalls function properly by reducing interference from debris. The existing stormdrain outfalls, structures and drainage channels will be modified or relocated to accommodate increased stormdrain flows associated with increased capacity upstream.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@40.812610250000006,-124.18765085289255,14z

Counties: Humboldt County, California

Endangered Species Act Species

There is a total of 12 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Pacific Marten, Coastal Distinct Population Segment *Martes caurina* There is **proposed** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/9081	Threatened

Birds

NAME	STATUS
Marbled Murrelet *Brachyramphus marmoratus* Population: U.S.A. (CA, OR, WA) There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/4467	Threatened
Northern Spotted Owl *Strix occidentalis caurina* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/1123	Threatened
Short-tailed Albatross *Phoebastria (=Diomedea) albatrus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/433	Endangered
Western Snowy Plover *Charadrius nivosus nivosus* Population: Pacific Coast population DPS-U.S.A. (CA, OR, WA), Mexico (within 50 miles of Pacific coast) There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8035	Threatened
Yellow-billed Cuckoo *Coccyzus americanus* Population: Western U.S. DPS There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened

Reptiles

NAME	STATUS
Green Sea Turtle *Chelonia mydas* Population: East Pacific DPS No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6199	Threatened

Fishes

NAME	STATUS
Tidewater Goby *Eucyclogobius newberryi* There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/57	Endangered

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Flowering Plants

NAME	STATUS
Beach Layia *Layia carnosa* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6728	Threatened
Menzies' Wallflower *Erysimum menziesii* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2935	Endangered
Western Lily *Lilium occidentale* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/998	Endangered

Critical habitats

There are 2 critical habitats wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Tidewater Goby *Eucyclogobius newberryi* https://ecos.fws.gov/ecp/species/57#crithab	Final
Western Snowy Plover *Charadrius nivosus nivosus* https://ecos.fws.gov/ecp/species/8035#crithab	Final

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

MIGRATORY BIRD INFORMATION WAS NOT AVAILABLE WHEN THIS SPECIES LIST WAS GENERATED. PLEASE CONTACT THE FIELD OFFICE FOR FURTHER INFORMATION.

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?
Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects
For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical

Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER POND

- Palustrine

RIVERINE

- Riverine

ESTUARINE AND MARINE DEEPWATER

- Marine
- Estuarine

IPaC User Contact Information

Agency: Eureka city
Name: Kerry McNamee
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Lead Agency Contact Information

Lead Agency: Federal Emergency Management Agency

NOAA Fisheries California Species List Tool
Official Species List for Eureka USGS 24K Quadrangle
Obtained on 6/15/2021 from Google Earth KMZ NMFS West Coast Region California Species List (last updated December 2016)

Quad Name	**Eureka**
Quad Number	**40124-G2**

1. ESA Anadromous Fish

SONCC Coho ESU (T) -	**X**
CCC Coho ESU (E) -	
CC Chinook Salmon ESU (T) -	**X**
CVSR Chinook Salmon ESU (T) -	
SRWR Chinook Salmon ESU (E) -	
NC Steelhead DPS (T) -	**X**
CCC Steelhead DPS (T) -	
SCCC Steelhead DPS (T) -	
SC Steelhead DPS (E) -	
CCV Steelhead DPS (T) -	
Eulachon (T) -	
sDPS Green Sturgeon (T) -	**X**

2. ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -	**X**
CCC Coho Critical Habitat -	
CC Chinook Salmon Critical Habitat -	**X**
CVSR Chinook Salmon Critical Habitat -	
SRWR Chinook Salmon Critical Habitat -	
NC Steelhead Critical Habitat -	**X**
CCC Steelhead Critical Habitat -	
SCCC Steelhead Critical Habitat -	
SC Steelhead Critical Habitat -	
CCV Steelhead Critical Habitat -	
Eulachon Critical Habitat -	
sDPS Green Sturgeon Critical Habitat -	**X**

3. ESA Marine Invertebrates

Range Black Abalone (E) -
Range White Abalone (E) -

4. ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

5. ESA Sea Turtles

East Pacific Green Sea Turtle (T) - X
Olive Ridley Sea Turtle (T/E) - X
Leatherback Sea Turtle (E) - X
North Pacific Loggerhead Sea Turtle (E) -

6. ESA Whales

Blue Whale (E) - X
Fin Whale (E) - X
Humpback Whale (E) - X
Southern Resident Killer Whale (E) - X
North Pacific Right Whale (E) - X
Sei Whale (E) - X
Sperm Whale (E) - X

7. ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

8. Essential Fish Habitat

Coho EFH - X
Chinook Salmon EFH - X
Groundfish EFH - X
Coastal Pelagics EFH - X
Highly Migratory Species EFH -

9. MMPA Species (See list at left)

10. **<u>ESA and MMPA Cetaceans/Pinnipeds</u>**

See list at left and consult the NMFS Long Beach office 562-980-4000

MMPA Cetaceans - **X**

MMPA Pinnipeds - **X**

Appendix B

CNDDB, CNPS, IPaC, and NMFS Database Searches

Appendix C

On-site ... Results

Photo 1 - View facing west, Project Area at intersection of D Street and Dollison Street in Eureka.

Photo 2 - View facing north, Project Area at intersection of Long Street and William Street in Eureka.

Site Visit Photographs

Photo 3 - View facing north, Project Area at intersection of Buhne Street and William Street in Eureka.

Photo 4 - View facing west, Project Area at intersection of Buhne Street and California Street in Eureka.

Site Visit Photographs

Photo 5 - View facing east, Project Area at intersection of Union Street and W Hawthorne Street in Eureka.

Photo 6 - View facing east, Project Area at intersection of California Street and W Sonoma Street in Eureka.

Site Visit Photographs

Photo 7 - View facing north, Project Area at intersection of C Street and Del Norte Street in Eureka.

Photo 8 - View facing southwest, Project Area at intersection of Del Norte Street and California Street in Eureka.

Photo 9 - View facing north, Project's staging area north of the Del Norte Street Pier in Eureka.

Photo 10 - View facing west, entrance to the Del Norte Street Pier in Eureka.

Photo 11 - View facing southwest, tidal channel.

Photo 12 - View facing west, tidal channel.

Photo 13 - View facing west, tidal channel substrate (pickleweed visible along channel edge).

Photo 14 - View facing west, tidal channel substrate (visible eelgrass; appeared to be unrooted).

Site Visit Photographs

Photo 15 - View facing southwest, tidal channel.

Photo 16 - View facing east, Palco Marsh.

Photo 17 - View facing southwest, tidal channel outlet to Humboldt Bay.

Site Visit Photographs

Photo 18 - View facing west, Project Area at intersection of W 14th Street and Railroad Avenue.

Photo 19 - View facing north, Project Area at intersection of Washington Street and Koster.

Site Visit Photographs

Appendix B
CNDDB, CNPS, IPaC, and NMFS Database Searches Results

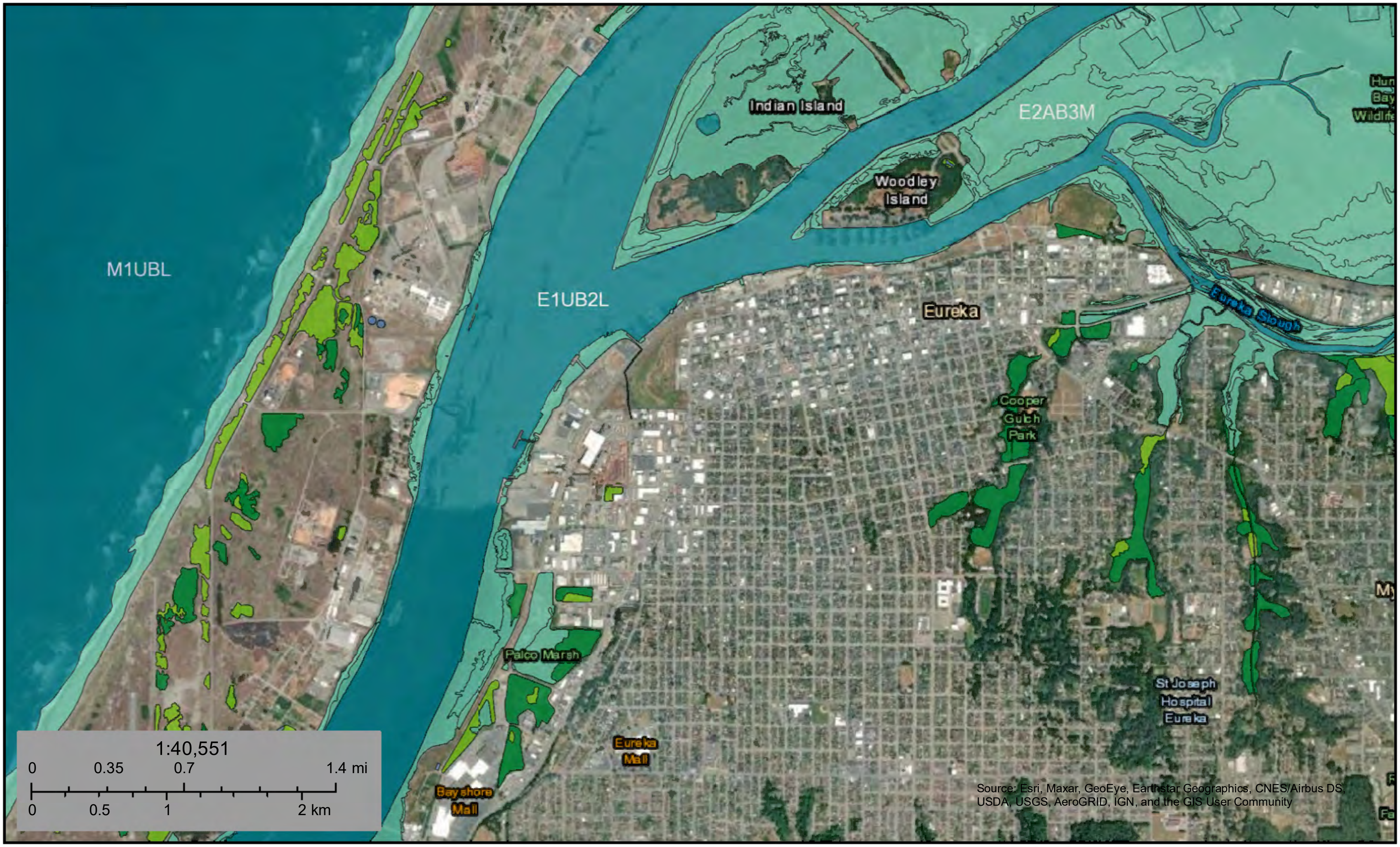
Appendix D
National Wetlands Inventory

Appendix L
Onsite Wildlife Species List

U.S. Fish and Wildlife Service

National Wetlands Inventory

NWI Wetlands Map 06.28.2021



June 28, 2021

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

Appendix E
NRCS Soils Report

Soil Map—Humboldt County, Central Part, California

Map Scale: 1:16,100 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0, 200, 400, 800, 1200

Feet: 0, 500, 1000, 2000, 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Humboldt County, Central Part, California
Survey Area Data: Version 6, Jun 1, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 8, 2019—Jun 21, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
212	Urban land-Halfbluff-Redsands complex, 0 to 5 percent slopes	489.3	39.1%
1008	Hydraquents mucky silt loam, strongly saline, 0-1 percent slopes, very frequently flooded	50.0	4.0%
1009	Hydraquents-Wassents mucky silt loam, strongly saline, 0-3 percent slopes, very frequently flooded	39.2	3.1%
1014	Urban land-Anthraltic Xerorthents association, 0 to 2 percent slopes	432.7	34.6%
DWM	Water, marine	240.0	19.2%
Totals for Area of Interest		**1,251.2**	**100.0%**

Appendix F
Appendices
Aquatic Resources Delineation Report

City of Eureka
Eureka Flood Reduction and Sea Level Rise Resiliency Project

Aquatic Resources Delineation Report

July 2022

Table of Contents

Appendices

1. Introduction

GHD prepared this aquatic resources delineation report and accompanying appendices on behalf of the City of Eureka, in support of the proposed Flood Reduction and Sea Level Rise Mitigation Project (Project) within the City of Eureka (**Appendix A, Figure 1**). This report supports the Project's environmental documentation, permitting, and construction planning as deemed appropriate. The proposed Project Study Boundary (PSB) is approximately 13.6 acres, and includes all areas of the Project which contain biological resources. The entire Project footprint is larger than the PSB, however contains developed hardscapes. The PSB is shown in **Appendix A, Figure 2**. This report is subject to, and must be read in conjunction with, the limitations set out in Section 5, Special Terms and Conditions, and the assumptions and qualifications contained throughout the report.

1.1 Project Description

The City of Eureka proposes this Project within urbanized coastal areas to reduce flooding, increase sea level rise resiliency, and improve water quality in Humboldt Bay. The Project improves the capacity and conveyance of the storm drain network to reduce flooding in combination with new tide and flap gates to reduce flood impacts from sea level rise. Low Impact Development (LID) features (e.g., rain gardens) will be placed along, or upstream of storm drain improvements and trash capture devices will be installed. Water quality benefits will be achieved by reductions in peak flows and runoff volumes that can create erosion and carry sediment loads to Humboldt Bay, and the LID features will provide additional pollutant removal from urban runoff. The trash capture devices will also reduce pollutants entering Humboldt Bay and help ensure that the system's outfalls function properly by reducing interference from debris. The existing stormdrain outfalls, structures and drainage channels will be modified or relocated to accommodate increased stormdrain flows associated with increased capacity upstream. Many of the Project components listed above are located within paved streets and other areas throughout the City of Eureka which do not contain vegetation, soil or natural hydrology (and thus could not be considered a wetland or Other Water of the U.S.). The PSB assessed in this report includes the 13.6 acre area where vegetation, soil and natural hydrology are present, and thus where aquatic resources (wetlands or Other Waters of the U.S.) could potentially be present.

1.2 Summary

GHD conducted the aquatic resources delineation fieldwork on May 11, 2021 and conducted a follow up site visit to confirm conditions and collect additional data on May 24, May 27, and July 26, 2021. Two additional areas (totaling 1.9 acres of the total) were added to the PSB in May 2022, and these areas were surveyed on May 18, 2022. The delineation was conducted within the PSB, as shown in **Appendix A, Figure 2**. United States Army Corps of Engineers (USACE) three-parameter wetlands were mapped based on wetland indicative vegetation, hydric soils, and wetland hydrology, and the high tide (considered Other Waters of the U.S.) line features based on vegetation and hydrology indicators. The PSB is within the Coastal Zone, specifically Palco Marsh is within the State's Jurisdiction which is regulated by the Coastal Commission under the Coastal Act, and the remaining areas of the Project within the Coastal zone are located in the local jurisdiction, regulated by the City of Eureka under their Local Coastal Program. Therefore one- or two-parameter wetlands were also mapped per the Coastal Act. Both three- and two-parameter wetlands, and Other Waters of the U.S. (tidal resources below the high tide line [Humboldt Bay tidal inlet] and freshwater dominant waters below the ordinary high water mark [Clark Slough}), were mapped as shown in **Appendix A, Figure 3**.

The wetland delineation resulted in four three-parameter wetlands with hydric soil, hydrophytic vegetation, and hydrology indicators located at Palco Marsh (W2), on the upstream (W3) and downstream (W4) side of a culvert near Felt Street, and in a muted tidal ditch located immediately west of the recreational trail (W5) (**Appendix A, Figure 3**). The total area of three-parameter wetlands within the PSB is 213,575 ft^2 (4.903 acres).

An extension of Humboldt Bay ("tidal inlet") occurs within the PSB, located west of Palco Marsh and includes approximately 43,350 ft^2 (1.000 acre) of land and water below the high tide line. Clark Slough, a historically tidally influenced slough channel to Humboldt Bay, is located in the north central portion of the Project near Koster and Washington Streets; approximately 4,095 ft^2 (0.094 acre) of land and water is considered below the ordinary high water mark.

A two-parameter wetland was identified near the terminus of Del Norte Street (W1), and occupies 930 ft^2 (0.021 acre). Wetland 1 lacked a dominance of hydrophytic vegetation, however contained hydric soils and wetlands hydrology. Wetlands 1 through 5 (W1-W5) are all surficially hydrologically connected to Humboldt Bay, and it is anticipated that all aquatic resources delineated will be USACE and RWQCB jurisdictional resources. The PSB is within the Coastal Zone, and all wetlands and other waters are anticipated to be either under the jurisdiction of the California Coastal Commission (CCC) or the City of Eureka's Local Coastal Program (LCP).

1.3 Regulatory Background

1.3.1 Federal

Waters of the United States

The Code of Federal Regulations (CFR), 40 CFR § 230.3 states the following:

The term waters of the United States means:

(1) All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
(2) All interstate waters including interstate wetlands;
(3) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
(i) Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
(ii) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
(iii) Which are used or could be used for industrial purposes by industries in interstate commerce;
(4) All impoundments of waters otherwise defined as waters of the United States under this definition;
(5) Tributaries of waters identified in paragraphs (s)(1) through (4) of this section;
(6) The territorial sea;

> *(7) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (s)(1) through (6) of this section; waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria of this definition) are not waters of the United States.* (40 CFR § 230.3).

Wetlands Definition

40 CFR § 230.3 continues and defines, "(t) The term wetlands means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas" (40 CFR § 230.3).

Wetlands Delineation Manual

The 1987 U.S. Army Corps of Engineers (USACE) Weltand Delineation Manual provides guidelines and methods to determine whether an area is a wetland subject to federal regulation under Section 404 of the Clean Water Act. The manual specifies that wetland hydrology, soil, and vegetation indicators must be present to identify a wetland (USACE 1987, p. 10). In addition, the Wetlands Delineation Manual states, "If hydrophytic vegetation is being maintained only because of man-induced wetland hydrology that would no longer exist if the activity (e.g., irrigation) were to be terminated, the area should not be considered a wetland," (USACE 1987).

Federal Geographic Data Committee (FGDC) Wetland Classification Standard

The Classification of Wetlands and Deepwater Habitats of the United States (FGDC 2013), based on Cowardin et al. (1979), states that wetlands must have at least one of the three wetland attributes: predominantly hydrophytic vegetation, predominantly hydric soil, and hydrology. However, they state that all available information should be used, and all three attributes should be considered if they are present (FGDC 2013).

1.3.2 State

The State Water Resources Control Board's (SWRCB) April 2019 *Procedures for Discharges of Dredged or Fill Material to Waters of the State* says the following:

> *An area is wetland if, under normal circumstances, (1) the area has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both; (2) the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate; and (3) the area's vegetation is dominated by hydrophytes or the area lacks vegetation.*
>
> *The Water Code defines "waters of the state" broadly to include "any surface water or groundwater, including saline waters, within the boundaries of the state." "Waters of the state" includes all "waters of the U.S." The following wetlands are waters of the state:*
>
> *1. Natural wetlands,*
> *2. Wetlands created by modification of a surface water of the state, and*
> *3. Artificial wetlands that meet any of the following criteria:*
> *a. Approved by an agency as compensatory mitigation for impacts to other waters of the state, except where the approving agency explicitly identifies the mitigation as being of limited duration;*
> *b. Specifically identified in a water quality control plan as a wetland or other water of the state;*

c. Resulted from historic human activity, is not subject to ongoing operation and maintenance, and has become a relatively permanent part of the natural landscape; or

d. Greater than or equal to one acre in size, unless the artificial wetland was constructed, and is currently used and maintained, primarily for one or more of the following purposes (i.e., the following artificial wetlands are not waters of the state unless they also satisfy the criteria set forth in 2, 3a, or 3b):

i. Industrial or municipal wastewater treatment or disposal,

ii. Settling of sediment,

iii. Detention, retention, infiltration, or treatment of stormwater runoff and other pollutants or runoff subject to regulation under a municipal, construction, or industrial stormwater permitting program,

iv. Treatment of surface waters,

v. Agricultural crop irrigation or stock watering,

vi. Fire suppression,

vii. Industrial processing or cooling,

viii. Active surface mining – even if the site is managed for interim wetlands functions and values,

ix. Log storage,

x. Treatment, storage, or distribution of recycled water, or

xi. Maximizing groundwater recharge (this does not include wetlands that have incidental groundwater recharge benefits); or

xii. Fields flooded for rice growing.

All artificial wetlands that are less than an acre in size and do not satisfy the criteria set forth in 2, 3.a, 3.b, or 3.c are not waters of the state. If an aquatic feature meets the wetland definition, the burden is on the applicant to demonstrate that the wetland is not a water of the state" (SWRCB 2019).

The February 2020 *Draft Guidance State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* further clarifies as follows:

Human activity can cause changes to the surrounding landscape (e.g., grading activities, road construction, direct hydromodification) such that wetlands form where wetlands did not previously exist. Where such artificial wetlands are now a relatively permanent part of the natural landscape, and are not subject to ongoing operation and maintenance, they are waters of the state. By requiring that the wetlands are relatively permanent, the framework excludes wetlands that are temporary or transitory. That they are part of the natural landscape also indicates the relative permanence of the wetlands and suggests that the wetland is self-sustaining without ongoing operation and maintenance activities, and provides similar ecosystem services as natural wetlands. By way of example, this category of wetlands includes situations where water flow is permanently redirected as the result of human activity, such as grading in another area, such that new wetlands form in areas that were previously dry. These wetlands may not be natural wetlands because they result from human activity and they were not formed by modifying a water of the state (rather they were an indirect result), but nevertheless they take on the function of natural wetlands such that they should be considered waters of the state. This category would not include artificial wetlands constructed for specific purposes listed in section II.3.d because the construction of the artificial wetlands would be too recent to be deemed "historic" and the artificial wetland would likely require ongoing maintenance such that they would not be deemed "relatively permanent," and/or the artificial wetland is not part of the "natural landscape" (SWRCB 2020).

1.3.3 Coastal Act

The PSB is within the Coastal Zone, specifically Palco Marsh is within the State's Jurisdiction which is regulated by the Coastal Commission under the Coastal Act, and the remaining areas of the Project within the Coastal zone are located in the local jurisdiction, regulated by the City of Eureka under their Local Coastal Program.

The California Coastal Act Section 30121 defines wetlands as "[L]ands within the coastal zone which may be covered periodically or permanently with shallow water and include saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats, and fens" (CCC 2011).

The Coastal Commission's "one-parameter definition" is outlined in the California Code of Regulations, Title 14 Section 13577 where it states, "Wetland shall be defined as land where the water table is at, near, or above the land surface long enough to promote the formation of hydric soils or to support the growth of hydrophytes, and shall also include those types of wetlands where vegetation is lacking and soil is poorly developed or absent as a result of frequent and drastic fluctuations of surface water levels, wave action, water flow, turbidity or high concentrations of salts or other substances in the substrate. Such wetlands can be recognized by the presence of surface water or saturated substrate at some time during each year and their location within, or adjacent to, vegetated wetlands or deep-water habitats" (14 CCR §13577) (CCC 2011).

California Code of Regulations Title 14 Section 30233, "limits the filling of wetlands to identified high priority uses, including certain boating facilities, public recreational piers, restoration, nature study, and incidental public services (such as burying cables or pipes). Any wetland fill must be avoided unless there is no feasible less environmentally damaging alternative, and authorized fill must be *fully mitigated" (14 CCR §30233)* (CCC 2011).

The Coastal Commission also regulates Environmentally Sensitive Habitat Areas (ESHA), which may include various types of wetlands, riparian areas, coastal prairies, woodlands and forests, and other natural resources in the coastal zone (CCC 2013). The Coastal Act defines ESHA as follows in §30107.5:

> *"Environmentally sensitive area" means any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments.*

2. Methodology

2.1 Wetland Delineation Approach

GHD environmental scientists conducted the wetland delineation on May 11, 2021, with an additional site visit to confirm findings on May 24, 2021 and to collect additional data on May 27, and July 26, 2021 and to survey additional areas on May 18, 2022. To define a wetland, the USACE requires that vegetation, soil, and hydrology (three-parameters) all show wetland attributes (USACE 1987; USACE 2010). The CCC requires only one-parameter of the three to be present in order to define the site as a wetland (14 CCR 13577). The wetland delineation used USACE criteria from the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys and Coast Region* (USACE 2010). The current standard field forms provided by the USACE (2010) were used to collect vegetation, soils, and hydrology data (**Appendix B)**.

In potential three-parameter wetland areas, vegetation, soil, and hydrology data were collected in a transect across the upland/wetland boundary with two plots (upland/wetland) per transect. The naming convention used on datasheets to designate upland or wetland plots associated with a transect is -U or -W, respectively.

One-parameter and three-parameter wetland/upland boundaries and plots were mapped in the field with an Eos Arrow 100 Submeter Global Positioning System (GPS) Reciever with Global Navigation Satellite System (GNSS) and an iPad running ArcGIS Collector software. The wetland/upland boundary was recorded with the GPS unit as needed to map the wetland's spatial extent. The points were then connected in the office using ArcMap software for figure creation and the boundaries were clipped to the extent of the PSB.

Each three-parameter and each one- (or two-) parameter wetland area was designated with a number (e.g., W1). The wetland points were also labeled with their respective wetland number. In addition to the wetland sampling points, two upland sampling points were described. These were labeled beginning with a "U" and numbered in sequence (e.g., U1, U2). The upland sampling points were completed to confirm and document the absence of any wetland indicators (soils, hydrology, and vegetation). **Appendix B** contains all datasheets recorded during the delineation.

2.2 Botanical methodology

Vegetation data collection consisted of listing the dominant species in the herbaceous, shrub, and tree layer within a standard-sized plot determined by the strata layer. Nomenclature follows *The Jepson Manual* (Baldwin et al. 2012), which was cross-walked to federal standard nomenclature to identify the indicator status. The species' wetland indicator status for the Western Mountains, Valleys, and Coast Region was denoted in the respective column, using the standard reference: *State of California 2016 Wetland Plant List* (Lichvar et al. 2016). This list classifies species based on the probability that they are found in wetlands (USACE 1987) as follows:

- Obligate (OBL): almost always in wetlands (99% probability)
- Facultative Wetland (FACW): usually occurring in wetlands (67% to 99% probability)
- Facultative (FAC): commonly occurring in wetlands and uplands (34% to 66% probability of occurring in wetlands)
- Facultative Upland (FACU): usually occurring in uplands (1% to 33% probability of occurring in wetlands)
- Upland (UPL): upland obligate, rarely in wetlands (1% in wetlands)

Species that do not appear on the list are considered to be in the upland category (Lichvar et al. 2016). Standard procedures for documenting hydrophytic vegetation indicators were used per the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)* (USACE 2010). A complete list of plants documented at the site with respective wetland indicator status is included as **Appendix C**. Site photographs have been included as **Appendix D.** The separate Botanical Resources Technical Memorandum contains the location and extent of potential rare plant occurrences within the PSB.

2.3 Soils Methodology

Hydric soils were defined based on the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0) (*USACE 2010) procedures in combination with the Natural Resources Conservation Service's (NRCS) definitions presented in *Field Indicators of Hydric Soils in the United States* (USDA/NRCS 2018). Soil pits were dug to an approximate maximum depth of 16 inches. Data on soil color, texture, and redoximorphic features were recorded. Any observed redoximorphic features (iron concentrations) were noted along with their percentage within the soil matrix, and care was taken to distinguish chromas of 1 and 2 indicative of an iron-depleted soil within 12 inches of the soil surface (USACE 2010; USDA/NRCS 2016).

The *Munsell Soil Color Book* (COLOR, M. 2000) was used to describe the soil colors for the entire depth of the test pit. Moist, natural soil aggregate (ped) surfaces, which had not been crushed, were used to determine the soil's color. Soils with low chroma were verified as being hydric or upland with *Field Indicators of Hydric Soils in the United States* (Version 8.2, 2018).

2.3.1 Existing Soils Information

The U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) identifies two soil units within the PSB (**Figure 5 in Appendix A** and NRCS report in **Appendix E**). A brief map unit description, as generated by the NRCS, is provided for each soil unit below (NRCS 2021). Although NRCS soil mapping is informative, the scale is generally too broad to definitively characterize potential wetlands. Please see the full report included as **Appendix E** for complete details.

Hydraquents mucky silt loam, strongly saline, 0 to 1 percent slopes

The Hydraquents 0 to 1 percent slopes map unit composition is described as strongly saline, very frequently flooded with mucky silt loam. This soil unit contains: 85 percent Hydraquents (high tidal) and similar soils, and 15 percent minor components (consisting of 10 percent Hydraquents [low tidal], and 5 percent water [marine]). Hydraquents soils can be found in tida marshes, and the parent material is mucky, silty and clayey estuarine deposits. Hydraquents consists of mucky silt loam in the top horizon (to approximately 13 inches), with mucky silty clay loam in the subsequent horizons (to approximately 51 inches), followed by mucky silt loam at the deepest horizon (to approximately 79 inches). Hydraquents has a land capability classification (LCC) of 8, meaning it is highly unsuitable for cultivation, and is considered a hydric soil and strongly saline. They are very poorly drained, and the depth to water table is 0-16 inches. This soil type is located in the central portion of the PSB and comprises approximately 7.3 acres (60 percent) of the Project (see **Figure 5**).

Urban land-Anthraltic Xerorthents association, 0 to 2 percent slopes

The Urban land-Anthraltic Xerorthents association composition includes: 80 percent urban land, (industrial), and 20 percent Anthraltic xerorthents and similar soils. This soil association can be found developed lands found upon fluviomarine terraces, and the parent material is coarse-loamy fluviomarine deposits and/or coarse-loamy dredge spoils. A typical profile of this soil association includes gravelly loamy fine sand in the top horizon (to approximately 6 inches), followed by sandy loam in the subsequent horizons (to approximately 31 inches), followed by gravelly sand (to approximately 43 inches), and underlain by sand in the final horizon (to approximately 65 inches). The Urban land component of this soil association has an LCC of 8, a depth to the water table of approximately 24 inches, frequently ponds and is not considered a hydric soil. The Anthraltic Xerorthents component of this soil association has an LCC of 3s for both irrigated an nonirrigated lands, a depth to the water table of 0 to 6 inches, frequently ponds and is not considered a hydric soil. This soil association is located in the northern extent of the PSB and comprises approximately 4.7 acres (39 percent) of the Project (see **Figure 5**).

Hydraquents-Wassents, 0 to 3 percent slopes

The Hydraquents-Wassents map unit composition includes: 50 percent Hydraquents (low tidal) and similar soils, 40 percent Wassents and similar soils, and 10 percent minor components (consisting of 5 percent Hydraquents [high tidal], and 5 percent water [marine]). This soil unit can be found in tidal flats and its parent material is mucky, silty and clayey estuarine deposits. The typical profile of Hydraquents consists of mucky silty clay loam across all horizons (to approximately 59 inches), and of Wassents consists of mucky silt loam in the top horizon (to approximately 6 inches), underlain by mucky silty clay loam in all remaining horizongs (to approximately 59 inches). The soils are considered very poorly drained or subaqueous, and the depth to water table is 0 inches. The LCC is 8, indicating these soils are highly unsuitable for cultivation, and both soils are considered hydric soils and strongly saline. This soil type is located in the southwest corner of the PSB and comprises approximately 0.1 acre (1.4 percent) of the Project (see **Figure 5**).

2.4 Hydrology Methodology

GHD delineated wetlands within the PSB on May 11, 2021, near the end of the wet season. An additional field check to confirm site conditions and collect additional data was conducted on May 24, May 27 and July 26, 2021. And following the addition of approximately 1.9 acres into the PSB, an additional survey was conducted on May 18, 2022 within these areas. Precipitation totaled approximately 0.78 inches in the month prior to the May 2021 delineation, and of that total, 0.10 inches within the two weeks prior to the delineation (NCEI 2021, **Appendix F**). The month prior to the May 18, 2022 delineation, approximately 2.88 inches of precipitation fell, and of that total 1.15 inches of precipitation fell within two weeks of the delineation (NCEI 2022, **Appendix F**). A WETS table showing climate data for the Woodley Island, Eureka Station, and a record of daily precipitation and temperature in the month prior to the delineation is provided in **Appendix F**. Aerial photography and the National Wetland Inventory Mapper were referenced before conducting fieldwork (**Appendix A, Figure 6**) (NWI 2021). The flood hazard map is also included in **Appendix A, Figure 7** (FEMA 2021). Wetland hydrology indicators, such as drainage patterns, material deposits, soil saturation, high water table, or surface water presence, were recorded in the field.

The PSB is surficially hydrologically connected to Humboldt Bay either directly or via tide gates which drain Palco Marsh and the wetland ditch west of the marsh to Humboldt Bay. The northwestern portion of the PSB (staging area) is completely paved. Runoff from this paved area drains to the wetlands located to the west (outside the PSB) which connect to Humboldt Bay.

3. Results

Weather conditions during field visits were mostly clear and sunny, and the delineation took place following a period of dry weather (0.10 inches of precipitation recorded within the last two weeks). The PSB contains four three-parameter, USACE jurisdictional wetlands, tidal and historically tidal resources (considered Other Waters of the U.S. and USACE jurisdictional), and one two-parameter wetland. Upland sampling points were also described within areas of planned disturbance to confirm and document the absence of wetland indicators in these areas**. Appendix A Figure 3** shows the results of the three-parameter wetland delineation, other waters. Summaries and anticipated jurisdictional status of each wetland or other water is presented in **Table 3-1** below.

3.1 Three-Parameter Wetlands

One large three-parameter wetland was observed in the central and northern extent of the PSB (W2). Two three-parameter wetlands were observed in the eastern extent of the PSB (W3 and W4), and a three-parameter wetland ditch (W5) was observed in the central portion of the Project (see **Appendix A, Figure 3**). The entire PSB is located within the Coastal Zone. Summaries of each three-parameter wetland are provided below, and square footage is provided in **Table 3-1**. Please see the USACE Data Forms in **Appendix B** for more details.

3.1.1 Wetland 2 (W2)

Wetland 2 is known as the Palco Marsh, and is a well established tidally influenced marsh, with muted tidal hydraulics. Wetland 2 was observed to occupy 202,685 ft^2 (4.653 acres) and was identified east of the gravel path and within the central portion of the PSB, south and west of the sidewalks. A stormwater drainage inlet exists in the northern portion of the PSB boundary. The northern extent contains greater freshwater input due to this stormwater drainage inlet, which is indicated by brackish plant species as compared to the salt marsh dominant plant species in the southern extent. No woody vegetation was observed within Wetland 2, with the area dominated by herbaceous species. Wetland 2 is classified according to Cowardin classification system as an Estuarine Emergent wetland with persistent vegetation that is regularly flooded (E2EM1n) (FGDC 2013). Wetland 2 is mapped as an Estuarine and Marine Wetland (E2EM1n) by NWI (see **Appendix A, Figure 5**).

The vegetated area within Wetland 2 contained herbaceous and hydrophytic vegetation, hydric soil and wetlands hydrology. Vegetation at the sample plot location was characterized by pickleweed (*Salicornia pacifica,* OBL), common spikerush (*Eleocharis macrostachya,* OBL), seaside arrowgrass (*Triglochin maritima,* OBL), and invasive dense-flowered cordgrass (*Spartina densiflora,* OBL). Wetland 2 met the criteria for the hydric soil indicator Hydrogen Sulfide (A4) due to the strong sulfur scent and matrix color (gleyed). Soil consisted of a top horizon (0-4”) of silty clay loam with a matrix color of 10YR 2/1, underlain by a silty clay loam horizon (4-12”) with a matrix color Gley 1 3/10Y. No redoximorphic features were observed. Numerous wetland hydrology indicators were observed, including: Surface Water (A1), High Water Table (A2), Saturation (A3), Water Marks (B1), Sediment Deposits (B2), Drift Deposits (B3), Inundation Visible on Aerial Imagery (B7), Hydrogen Sulfide Odor (C1), and secondary indicators including: Drainage Patterns (B10) and Geomorphic Position (D2). Surface water was visible in portions of Wetland 2, however was not visible at the W2T1-W transect location. Please see attached data form for sample point W2T1-W in **Appendix B** for additional details.

Wetland 2 is hydrologically connected to Humboldt Bay via a tidegate located in the southern portion of the PSB. Wetland 2 is considered under the jurisdiction of the USACE and the RWQCB due to its hydrologic connectivity to a navigable waterway. Wetland 2 is within the state permitting authority of the Coastal Zone and is therefore under the jurisdiction of the California Coastal Commission (see **Table 3-1**).

3.1.2 Wetland 3 (W3)

Wetland 3 was observed to occupy 630 ft^2 (0.014 acre) in the eastern extent of the PSB, in a lowland field that collects water and drains via a culvert under Felt Street to Wetland 4. Well established rooted vegetation with an herbaceous understory was observed in this area, and is classified according to Cowardin classification system as a Palustrine Forested wetland with broad-leaved deciduous vegetation that is seasonally flooded (PFO1C) (FGDC 2013). According to the NWI mapper (USFWS 2021), Wetland 3 is considered a Palustrine Scrub-Shrub with broad-leaved deciduous vegetation that is seasonally flooded (PSS1C). The vegetation appears taller than 20 feet, therefore the classification should be Forested as opposed to Scrub-Shrub.

The vegetation in Wetland 3 consisted of Pacific willow (*Salix lasiandra* var. *lasiandra,* FACW), red alder (*Alnus rubra,* FAC), common spikerush (*Eleocharis macrostachya,* OBL), seaside arrowgrass (*Triglochin maritima,* OBL), horsetail (*Equisetum arvense,* FAC), water parsley (*Oeanthe sarmentosa,* OBL), creeping buttercup (*Ranunculus repens,* FAC), small flowered hemicarpha (*Lipocarpha micrantha* [formerly: *Scirpus micranthus*]*,* OBL). Soils met the criteria for hydric soil indicator Depleted Matrix (F3). The upper horizon (0-3.5") consisted of loam with a matrix color of 7.5YR 2.5/1, and the lower horizon (3.5-15") consisted of loamy sand with a matrix color (5Y 4/1) and contained a significant amount of redoximorphic features (60%) which had a color of 7.5YR 4/6. Wetland hydrology was indicated by the presence of saturated soil, Reduced Iron (C4), and secondary indicators: Water Stained Leaves (B9), Drainage Patterns (B10), and it passed the Fac-Neutral Test (D5). Please see attached data forms for sample point W3T1-W in **Appendix B** for additional details.

Wetland 3 was observed to be hydrologically connected to flow via a culvert beneath Felt Street to Wetland 4, which connects to the Palco Marsh and thus to Humboldt Bay, a navigable water. Therefore, Wetland 3 is considered jurisdictional by the USACE and RWQCB, and is within the local permitting authority of the Coastal Zone is under the jurisdiction of the City of Eureka (see **Table 3-1**).

3.1.3 Wetland 4 (W4)

Wetland 4 was observed to occupy 2,120 ft^2 (0.049 acre) in the eastern extent of the PSB. Wetland 4 contains a culvert that drains water from Wetland 3, and is located in a patch of woody-vegetation dominated area of the eastern extent of the Palco Marsh. Wetland 4 may be classified according to Cowardin classification system as a Palustrine Forested wetland with broad-leaved deciduous vegetation that is seasonally flooded (PFO1C) (FGDC 2013). According to the NWI mapper (USFWS 2021), Wetland 4 is considered part of the Palco Marsh which is classified as Estuarine Inertidal Emergent Persistent that is regularly flooded (E2EM1N). However, Wetland 4 is dominated by a woody vegetated canopy, which is distinctly different from the Palco Marsh (Wetland 2), and therefore does not qualify as E2EM1N.

The vegetation in Wetland 4 consisted of Arroyo willow (*Salix lasiolepis,* FACW), common spikerush (*Eleocharis macrostachya,* OBL), Pacific silverweed (*Potentilla anserina,* OBL), and seaside arrowgrass (*Triglochin maritima,* OBL). Soils met the criteria for hydric soil indicator Loamy Mucky Mineral (F1). The single horizon observed (0-15") consisted of silt with a matrix color of 2.5Y 3/2 and was extremely wet and mucky with an evident sulfur smell. Wetland hydrology was indicated by the presence of water table at a depth of 15", and saturated soil at a depth of 3". Wetland hydrology primary indicator High Water Table (A2), and secondary indicators Water Stained Leaves (B9), and Fac-Neutral Test (D5) were present. Please see attached data forms for sample point W4T1-W in **Appendix B** for additional details.

Wetland 4 is immediately adjacent to Palco Marsh (which Wetland 2 is within), and is therefore hydrologically connected to Humboldt Bay, a navigable water. Therefore, Wetland 4 is considered jurisdictional by the USACE and RWQCB, and is within the local permitting authority of the Coastal Zone is under the jurisdiction of the City of Eureka (see **Table 3-1**).

3.1.4 Wetland 5 (W5)

Wetland 5 was observed to occupy 8,130 ft^2 (0.187 acre) in the western extent of the PSB between the gravel path and Wetland 2, and was observed in a tidally influenced ditch. Wetland 5 contained a distinct bed, bank and channel with an unconsolidated sandy bottom, as well as herbaceous vegetation along the banks. Therefore the tidal-ditch portion of Wetland 5 may be classified according to Cowardin classification system as a Estuarine Intertidal Streambed with sand (E2SB4), and the herbaceous porion along the banks may be classified as Estuarine Intertidal Emergent Persistent that is regularly flooded (E2EM1N). This aquatic resource is not mapped on the NWI mapper (USFWS 2021), however exhibits wetland ditch characteristics.

The vegetation at the W5T1-W point consisted of pickleweed (*Salicornia pacifica,* OBL), and rabbitfoot grass (*Polypogon mospeliensis,* FACW), which is consistent with the vegetation observed in Wetland 5. Soils met the criteria for hydric soil indicator Depleted Matrix (F3). The upper horizon (0-2”) consisted of silt loam with a matrix color of 5Y 2.5/2, and the lower horizon (2-12”) consisted of silty clay loam with a matrix color (5Y 4/1) and contained approximately 2 percent redoximorphic features which had a color of 5Y 6/8. Wetland hydrology was indicated by the presence of Saturation (A3) at 10 inches, and the presence of standing water adjacent to the sample point. See attached data forms for sample point W5T1-W in **Appendix B** for additional details.

Wetland 5 was observed to be hydrologically connected to Wetland 2 (Palco Marsh) to the east and Humbodlt Bay to the west via a culvert in the southern portion of the PSB. Therefore, Wetland 5 is considered jurisdictional by the USACE and RWQCB, and is within the local permitting authority of the Coastal Zone is under the jurisdiction of the City of Eureka (see **Table 3-1**).

3.2 Two-Parameter Wetlands

Two-parameter wetlands within the PSB were observed in the northwestern portion of the PSB (W1). Although the observed vegetation was not dominated by hydrophytic vegetation, the area contained hydric soils and is hydrologically connected to Humboldt Bay via the tidal inlet to the east.

3.2.1 Wetland 1 (W1)

Wetland 1 was identified west of the Humboldt Bay tidal inlet in the northwestern portion of the PSB. Wetland 1 consists of a drainage swale at the western extent and central depression area which is connected to the Bay tidal inlet to the east via a culvert, and therefore hydrologically connected to Humboldt Bay. For the purposes of this Project, Wetland 1 terminates at the western PSB boundary, however the drainage swale extends beyond the western PSB boundary. Wetland 1 was observed to occupy 930 ft^2 (0.021 acre) of the PSB.

The area within Wetland 1 contained herbaceous plants that are presumably seasonally inundated. Wetland 1 consisted of saturated soil with limited hydrophytic vegetation, and contained a majority of Facultative-upland (FACU) or Upland (Up) species. Observed vegetation consisted of English ivy (*Hedera helix,* FACU), sweet vernal grass (*Anthoxanthum odoratum,* FACU), paradise apple (*Malus pumila,* UPL), spring vetch (*Vicia sativa,* UPL), California aster (*Symphyotrichum chilense,* FAC), fennel (*Ferniculum vulgare,* UPL), cutleaf geranium (*Geranium dissectum,* UPL), curly dock (*Rumex crispus*, FAC), coyote brush (*Baccharis pilularis,* UPL) and invasive Himalayan blackberry (*Rubus* *armeniacus*, FAC). At the follow-up site visit on May 24th, 2021, mountain bog bulrush (*Scirpus microcarpus,* OBL) was observed in Wetland 1. Soil in Wetland 1 consisted of a Depleted Matrix (F3) with a top horizon (0-5") of sandy loam with a matrix color of 2.5Y 3/2, above a horizon (5-13") of sandy clay loam with a matrix color of 5Y 4/2, with 10 percent redoximorphic features with a color of 10YR 5/8. The soil reacted positively with alpha-alpha-dipyridyl, also indicating the presence of hydric soil.

Indicators of wetland hydrology at the site included Drainage Patterns (B10) and Geomorphic Position (D2). Please see attached data form for sample point W1T1-W in **Appendix B** for additional details. Wetland 1 is expected to be considered under the jurisdiction of the USACE and RWQCB because it is hydrologically connected to the Humboldt Bay tidal inlet via a culvert, however exhibits two of the three parameters needed to be considered a USACE-jursidictional wetland. Wetland 1 is within the Coastal Zone and is within the local permitting authority of the Coastal Zone is under the jurisdiction of the City of Eureka (see **Table 3-1**).

3.3 Other Waters of the U.S. and/or State

Tidal waters, which are USACE jurisdictional and considered Other Waters of the U.S., were observed in the western extent of the PSB. A former tidal slough channel (Clark Slough) is located in the north-central portion of the PSB (see **Appendix A, Figure 3B**).

3.3.1 Humboldt Bay Tidal Inlet

A tidal inlet of Humboldt Bay was observed in the western portion of the PSB. The high tide line was delineated using physical indicators such as changes in character of vegetation, presence of litter or debris, or difference in color. The highest astronomical tide measured at the North Spit of Humboldt Bay, which is in the vicinity of the Project, is 8.52 feet (NAVD88 Datum), which was utilized as a guide in the mapping to delineate the high tide line. Within this area there is approximately 43,350 ft^2 (1.000 acre) of land and water considered below the high tide line.

Land and water below the high tide line is considered under the jurisdiction of the USACE via Section 404 of the Clean Water Act (USACE 2016). Due to its location within state waters (up to three miles off of the coast) and within the Coastal Zone is also considered under the jurisdiction of the RWQCB and California Coastal Commission, respectively (see **Table 3-1**).

3.3.2 Clark Slough

The north-central portion of the PSB contains a historically tidal inlet known as Clark Slough, located at Washington and Koster Streets. The portion of Clark Slough within the PSB is located approximately 0.25 miles upstream from an existing tide gate. Water quality readings within Clark Slough on April 27, 2022 indicated salinities of 14 to 28 parts per thousand (ppt) (RTA and CalPoly Humboldt 2022), suggesting that the tide gate is leaking, however its unknown to what degree. Vegetation in the upper margins of Clark Slough included common reed (*Phragmites austalis*), and fat hen (*Atriplex prostrata*), and vegetation beyond the upper margin consisted of upland and facultative upland species. This channel is though to predominantly convey stormwater and not receive incoming tidal influence, and thereore the ordinary high water mark was delineated in this location. Approximately 4,095 ft^2 (0.094 acre) of land and water is considered below the ordinary high water mark.

In non tidal system, land and water below the ordinary high water mark is considered under the jurisdiction of the USACE via Section 404 of the Clean Water Act (USACE 2016). Due to its location within the local permitting authority of the Coastal Zone, it is under the jurisdiction of the City of Eureka, as well as the RWQCB (see **Table 3-1**).

3.4 Summary of Aquatic Resources

In total, approximately 261,930 ft^2 (6.013 acres) of aquatic resources were observed in the PSB, comprised of 213,575 ft2 (4.903 acres) of three-parameter wetlands (W2-W5), 930 ft2 (0.021 acre) of two-parameter wetlands (W1), and 47,445 ft^2 (1.089 acre) of Other Waters of the U.S (Humboldt Bay Tidal Inlet and Clark Slough). See **Table 3-1** for an overview of the area and anticipated jurisdictional status of each aquatic resource.

Table 3-1. Aquatic Resources within the Delineated Area and Potential Jurisdiction

Aquatic Resource Name	Location (lat/long) of point	Aquatic Resource Size	Jursidiction		
			USACE	RWQCB	CCC/City
Wetland 1 (W1T1-W)	40.790260, -124.185812	930 ft^2 (0.021 acre)	Yes	Yes	Yes
Wetland 2 (W2T1-W)	40.789458, -124.185573	202,685 ft^2 (4.653 acres)	Yes	Yes	Yes
Wetland 3 (W3T1-W)	40.789399, -124.183961	630 ft^2 (0.014 acre)	Yes	Yes	Yes
Wetland 4 (W4T1-W)	40.789262, -124.184190	2,120 ft^2 (0.049 acre)	Yes	Yes	Yes
Wetland 5 (W5T1-W)	40.788778, -124.185872	8,130 ft^2 (0.187 acre)	Yes	Yes	Yes
Humboldt Bay Tidal Inlet	40.790043, -124.185780	43,350 ft^2 (1.000 acre)	Yes	Yes	Yes
Clark Slough	40.798416, -124.178994	4,095 ft (0.094 acre)	Yes	Yes	Yes
Total Aquatic Resources in PSB		**261,930 ft^2 (6.013 acres)**			

Please note: Total acreage is presented based upon the total square footage of the resources, not the sum of acreage for each independent resource.

3.5 Uplands Sampling Points

Upland sampling points were also collected to characterize areas that are likely to be affected by the Project. No wetlands were detected within the areas characterized by the following upland points, which are also located within the Coastal Zone (**Table 3.2**).

3.5.1 Upland 1

The Upland 1 sample point was located in the central extent of the PSB, in an area of fill between the tidal inlet and recreational path. Vegetation present included: sweet vernal grass (*Anthoxanthum odoratum,* FACU), Queen Anne's lace (*Dancus carota,* FACU), rattlesnake grass

(*Briza maxima,* UPL), invasive Himalayan blackberry (FAC), English plantain (*Plantago lanceolata,* FACU), hairy cats ear (*Hypochaeris radicata,* FACU), invasive velvetgrass (*Holcus lanatus,* FAC), bird's foot trefoil (*Lotus corniculatus,* FACU), and soft brome (*Bromus hordeaceus,* FACU). Soils did not show hydric soil characteristics, were comprised of fill material and contained a matrix color of 7.5YR 2.5/3. The site did not show any primary or secondary indicators of wetland hydrology.

3.5.2 Upland 2

The Upland 2 sample point was located in the southern extent of the PSB boundary, in an area of fill between the tidal inlet and the recreational path. Vegetation present included: slender oat (*Avena barbata,* UPL), English plantain (FACU), rattlesnake grass (UPL), Queen Anne's lace (FACU), shamrock clover (*Trifolium dubium,* FACU), bromegrass (*Bromus diandrus,* UPL), fennel (*Foeniculum vulgare,* UPL), little quaking grass (*Briza minor,* FAC), hairy cats ear (FACU), soft brome (FACU), and wild radish (*Raphanus sativus*, UPL). Soils did not show hydric soil characteristics, were comprised of gravelly fill material and contained a matrix color of 10YR 2/2 with no redoximorphic features. The site did not show any primary or secondary indicators of wetland hydrology.

3.5.3 Upland 3

The Upland 3 sample point was located north of Wetland 5, immediately west of the recreational path in a low-lying area. Vegetation present included: tall fescue (*Festuca arundinacea,* FAC), fat hen (*Atriplex prostrata,* FAC), English ivy (*Hedra helix,* FACU), spring vetch (*Vicia sativa,* UPL), fennel (UPL), seaside barley (*Hordeum marinum,* FACU), soft brome (FACU), wild radish (UPL), rattlesnake grass (UPL), sweet vernal grass (FACU), and bur clover (*Medicago polymorpha,* FACU). Soils did not show hydric soil characteristics, and were comprised of two horizons with matrix colors of 10YR 2/1 (0-6"), and 7.5YR 3/1 (6-16") with no redoximorphic features. Organic matter was observed in the soil. The site showed one secondary indicator of wetland hydrology: Geomorphic Position (D2).

3.5.4 Summary of Upland Sampling Points

Three upland sampling points were dug, which did not yield the presence of wetland indicators (vegetation, soils or hydrology). Locations of the upland sampling points are shown on Figure 3 within Appendix A, and coordinates are provided below in Table 3.2.

Table 3.2 Upland Sampling Point Locations

Sampling Point Name	Location (lat/long)
Upland 1 (Up1)	40.788654, -124.186069
Upland 2 (Up2)	40.787673, -124.186655
Upland 3 (Up3)	40.789574, -124.185622

4. Conclusions

The aquatic resources delineation for the City of Eureka's Flood Reduction and Sea Level Rise Mitigation Project, completed on May 11, 2021 (with follow up visits on May 24, May 27, and July 26, 2021 and additional areas added to the Project surveyed on May 18, 2022), determined the extent of wetlands and other waters within the PSB based on hydrophytic vegetation, hydric soils, and wetland hydrology using methods and indicators outlined in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys and Coast Region* (USACE 2010). A total of 213,575 ft^2 (4.903 acres) of three-parameter wetlands occur within the PSB (W2 – W5), with surficial hydrological connection with a navigable water, and are therefore regulated by the USACE, RWQCB and the California Coastal Commission. A total of 930 ft^2 (0.021 acre) of two-parameter wetlands occur within the PSB (W1), which contain hydric soils and surficial connection with a navigable waterway and are therefore regulated by the USACE, RWQCB, and the California Coastal Commission . A tidal inlet, which is an extension of Humboldt Bay, exists within the PSB, of which 43,350 ft2 (1.000 acre) of land and water are below the observed high tide line and are under the jurisdiction of the USACE, RWQCB and California Coastal Commission. Clark Slough, a historically tidally influenced ditch, is located in the northern extent of the PSB, of which 4,095 ft^2 (0.094 acre) of land and water are below the ordinary high water mark and are also under the jurisdiction of the USACE, RWQCB, and California Coastal Commission, for a total of 47,445 ft^2 (1.089 acres) of other waters within the PSB. See **Appendix A, Figure 3** for the spatial locations of delineated aquatic resources. Data forms are attached showing sample plot data collected in transects across wetland boundaries and additional upland sampling points (**Appendix B**).

5. Special Terms and Conditions

5.1 Purpose of this Report

GHD prepared this report for the City of Eureka (City), and the City may only use and rely on this report for the purpose agreed upon between GHD and the City, as set out in the scope and contract for work effort reported herein. GHD Inc. is not liable for any action arising out of the reliance of any third party on the information contained within this report. GHD otherwise disclaims responsibility to any entity other than the City arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

5.1 Scope and Limitations

This report does not authorize any individuals to develop, fill, or alter the delineated wetlands. Verification of the delineation by jurisdictional agencies is necessary prior to the use of this report for planning and development purposes. A USACE, agency-stamped, delineation map, and a jurisdictional approval letter are required to signify confirmation of delineation results. In situations where a field investigation determines that no jurisdictional wetlands occur, jurisdictional concurrence with these findings is recommended.

The delineation conclusions were based on the information available during the period of the investigation, which took place May 11, May 24, May 27, and July 26, 2021, and May 18, 2022. The opinions, conclusions, and any recommendations in this report are based on conditions encountered and information reviewed by the date of preparation of the report. Site conditions may change after the date of this report. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD is also not responsible for updating this report if the site conditions change unless contracted to do so.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions, and any recommendations in this report are based on the information obtained from and testing undertaken at or in connection with specific sample points. Conditions at other locations of the site may be different from the conditions found at the specific sample points.

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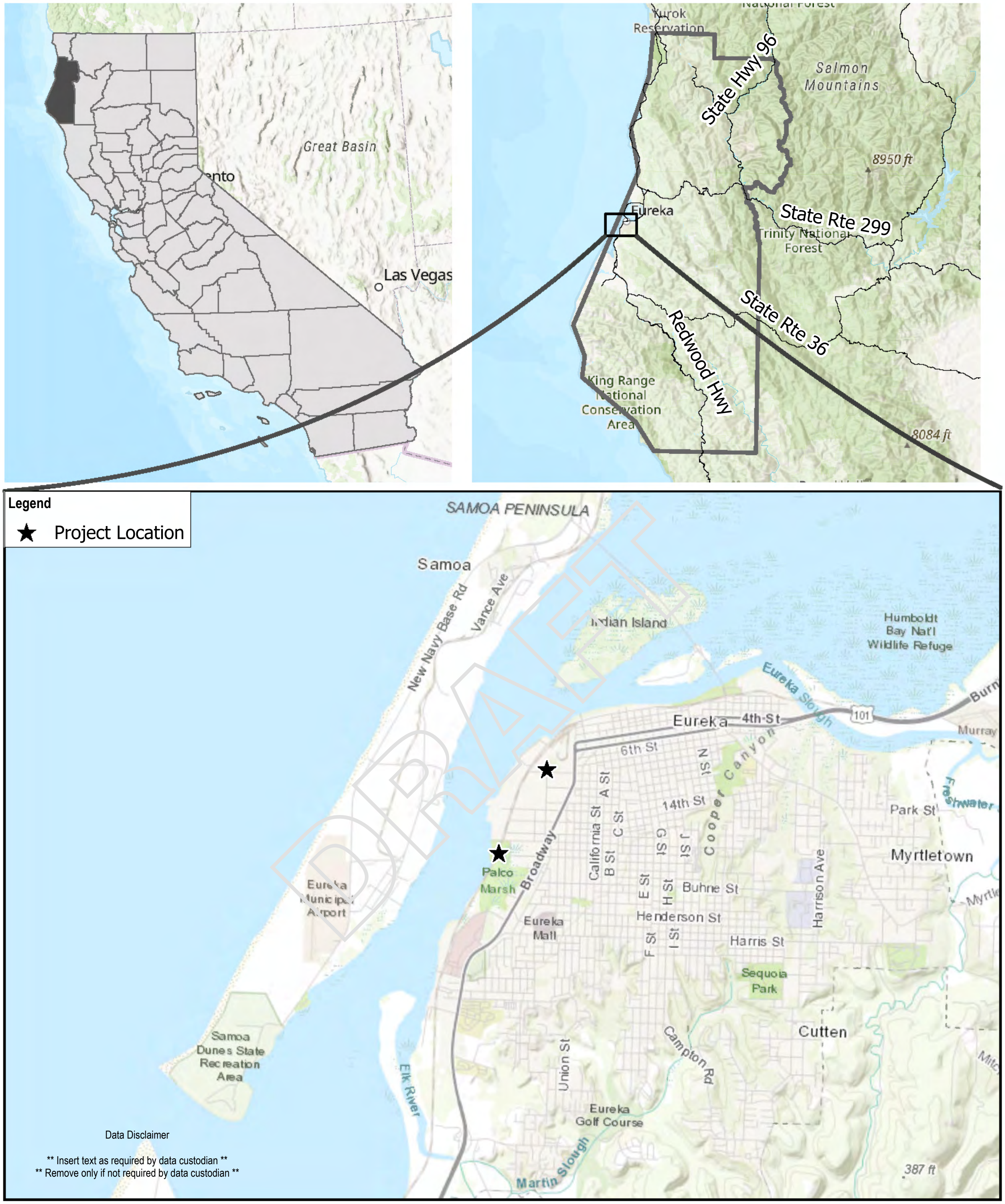
Appendices

Appendix A – Figures



Paper Size ANSI A

0 0.25 0.5 0.75 1

Miles

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

N

GHD

City of Eureka
Flood Reduction and
Sea Level Rise Mitigation Project

Project No. **11220813**
Revision No. **-**
Date **June 2022**

Regional Map

FIGURE 1

N:\US\Eureka\Projects\561\11220813\GIS\Maps\Deliverables\Aquatic_Resources_Delineation\11220813_Aquatic_Resources_Delineation_RevB.aprx - 11220813_001_SLR_RegionalMap
Print date: 20 Jun 2022 - 07:43

Data source: World Topographic Map: Bureau of Land Management, Esri, HERE, Garmin, USGS, METI/NASA, NGA, EPA, USDA; World Topographic Map: Esri, HERE, Garmin, FAO, NOAA, USGS, EPA; World Topographic Map: California State Parks, Esri, HERE, Garmin, FAO, NOAA, USGS, Bureau of Land Management, EPA, NPS; World Hillshade: Esri, USGS. Created by: djones3

Paper Size ANSI A

0 50 100 150 200

Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

N

City of Eureka
Flood Reduction and
Seal Level Rise Mitigation Project

Project Area

Project No. **11220813**
Revision No. **-**
Date **June 2022**

FIGURE 2

Data source: World_Transportation; Esri, HERE, GeoTechnologies, Inc., World Imagery; Maxar, Microsoft, GHD. Created by: djones3

N:
\US\Eureka\Projects\561\11220813\GIS\Maps\Deliverables\Aquatic_Resources_Delineation\11220813_Aquatic_Resources_Delineation_RevB.aprx
Print date: 21 Jun 2022 - 18:19

Paper Size ANSI A

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Feet

N

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

GHD

City of Eureka
Flood Reduction and
Seal Level Rise Mitigation Project

Aquatic Resource Delineation

Project No. **11220813**
Revision No. **-**
Date **June 2022**

FIGURE 3A

N:\US\Eureka\Projects\561\11220813\GIS\Maps\Deliverables\Aquatic_Resources_Delineation\11220813_Aquatic_Resources_Delineation_RevB.aprx - 11220813_003A_Aquatic_Resource_Delineation_ARD
Print date: 21 Jun 2022 - 17:55

Data source: World_Transportation; Esri, HERE, GeoTechnologies, Inc., World Imagery; Maxar, Microsoft, GHD. Created by: djones3

Paper Size ANSI A

0 5 10 15 20 25

Feet

N

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

GHD

City of Eureka
Flood Reduction and
Seal Level Rise Mitigation Project

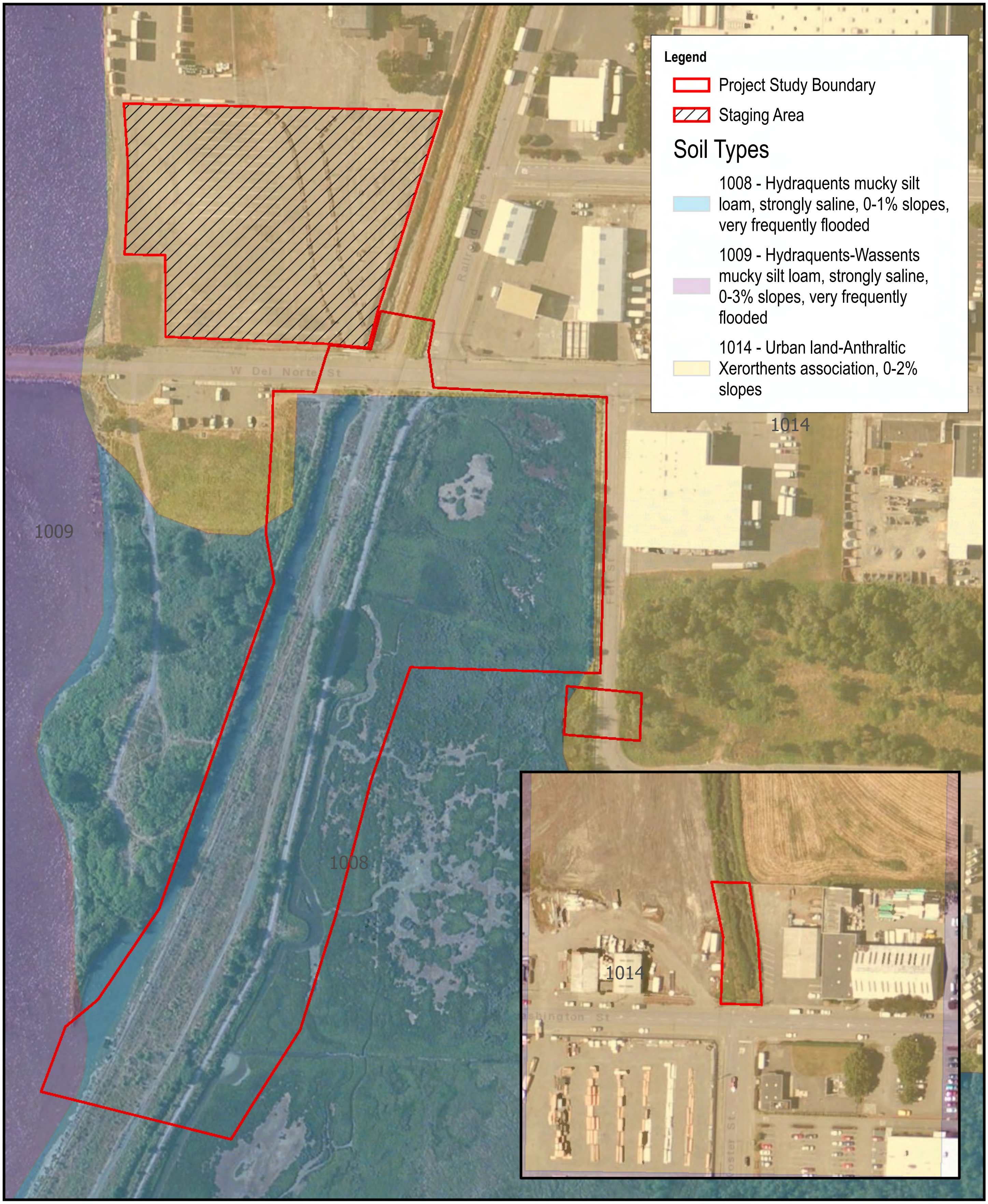
Aquatic Resource Delineation

Project No. **11220813**
Revision No. **-**
Date **June 2022**

FIGURE 3B

N:\US\Eureka\Projects\561\11220813\GIS\Maps\Deliverables\Aquatic_Resources_Delineation\11220813_Aquatic_Resources_Delineation_RevB.aprx - 11220813_003B_Aquatic_Resource_Delineation_ARD
Print date: 21 Jun 2022 - 18:13

Data source: GHD, NOAA, World Imagery; Maxar, Microsoft. Created by: djones3



Paper Size ANSI A

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Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

N

GHD

City of Eureka
Flood Reduction and
Seal Level Rise Mitigation Project

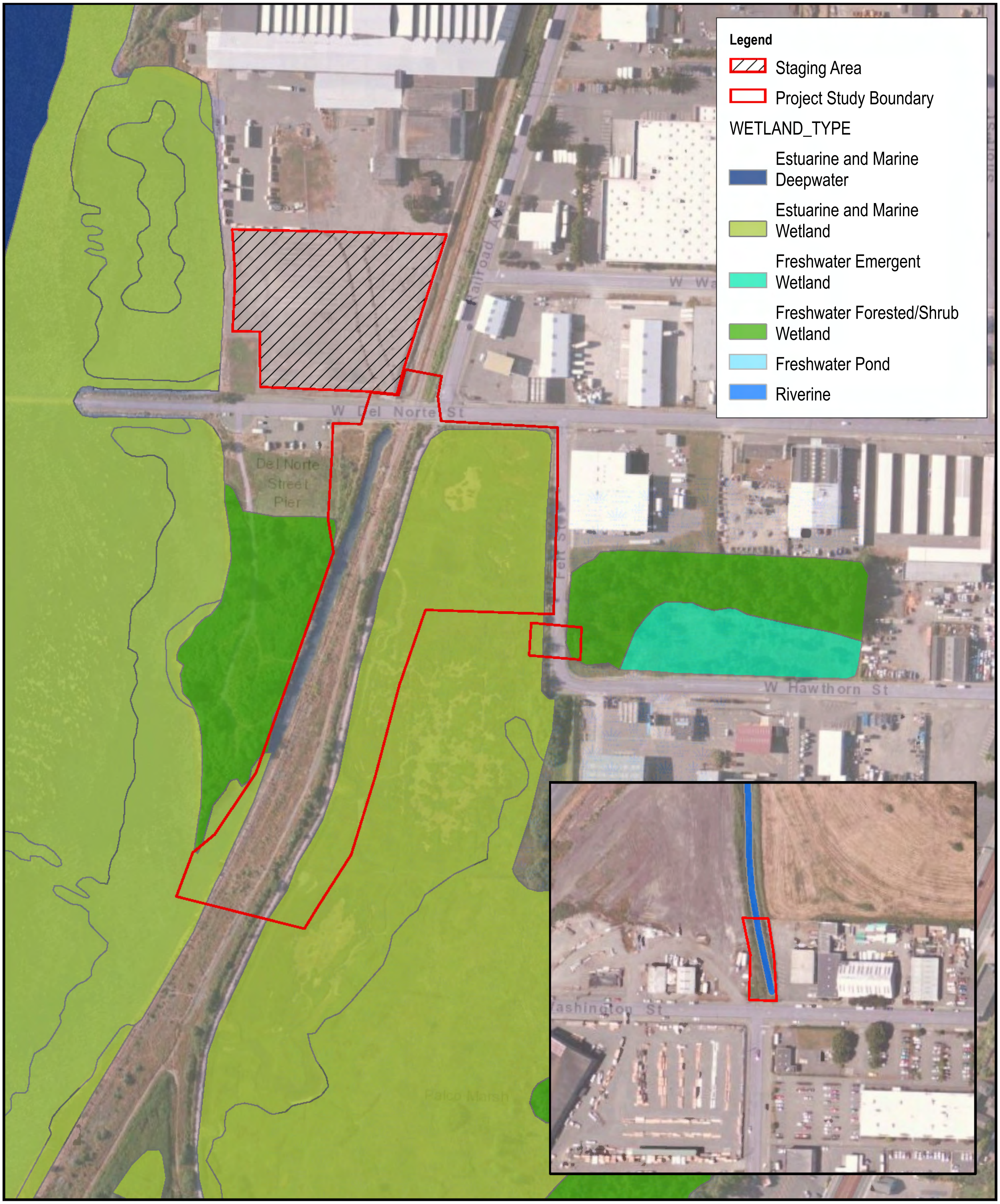
NRCS Soils

Project No. **11220813**
Revision No. **-**
Date **Jun 2022**

FIGURE 4

N:\US\Eureka\Projects\561\11220813\GIS\Maps\Deliverables\Aquatic_Resources_Delineation\11220813_Aquatic_Resources_Delineation_RevB.aprx - 11220813_004_Aquatic_Resource_Delineation_NRCS
Print date: 21 Jun 2022 - 18:33

Data source: World Imagery (Clarity): Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community; World Street Map: Bureau of Land Management, Esri, HERE, Garmin, NGA, USGS. NRCS Web Soil Survey, Feb 2021. Created by: djones3



Paper Size ANSI A

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Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

N

GHD

City of Eureka
Flood Reduction and
Seal Level Rise Mitigation Project

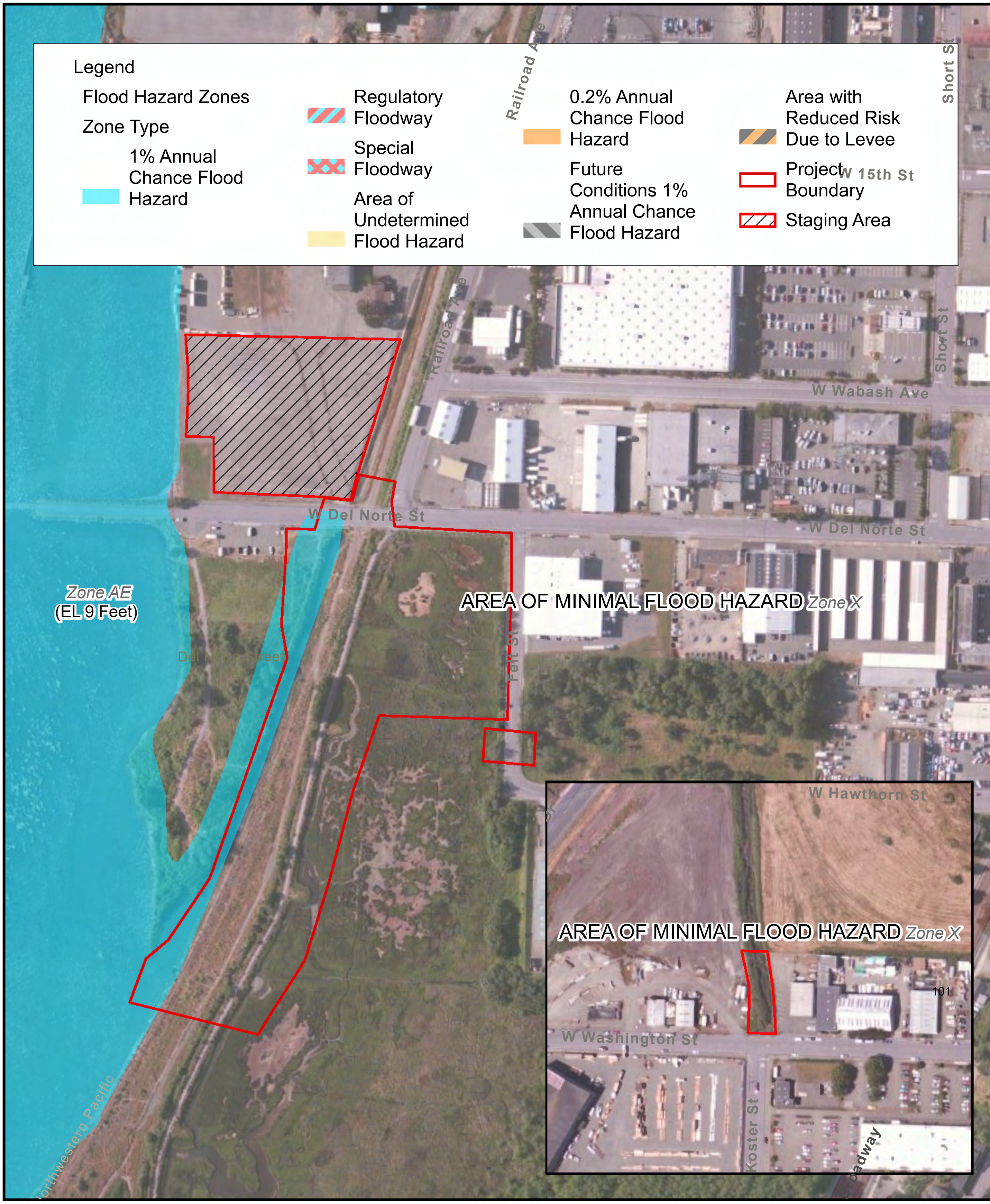
Project No. **11220813**
Revision No. **-**
Date **Jun 2022**

National Wetland Inventory

FIGURE 5

N:\US\Eureka\Projects\561\11220813\GIS\Maps\Deliverables\Aquatic_Resources_Delineation\11220813_Aquatic_Resources_Delineation_RevB.aprx - 11220813_005_Aquatic_Resource_Delineation_NWI
Print date: 21 Jun 2022 - 18:41

Data source: World Imagery (Clarity): Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community; World Street Map: Bureau of Land Management, Esri, HERE, Garmin, NGA, USGS. USFWS and National Wetlands Inventory. Created by: djones3



Paper Size ANSI A

0 100 200 300

Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

N

City of Rio Dell
Water Tank Seismic Retrofit Project
HMGP DR-4558

FEMA FIRM Map
Source: 0623C 0830F

Project No. **11220813**
Revision No. **-**
Date **June 2022**

FIGURE 6

N:\US\Eureka\Projects\561\11220813\GIS\Maps\Deliverables\Aquatic_Resources_Delineation\11220813_Aquatic_Resources_Delineation_RevB.aprx - 11220813_006_Aquatic_Resource_Delineation_FEMA
Print date: 21 Jun 2022 - 18:48

Data source: World Imagery (Clarity): Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community; World Street Map: Esri Community Maps Contributors, California State Parks, © OpenStreetMap, Microsoft, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, US Census Bureau, USDA, GHD. Created by: djones3

Appendix B – Data Sheets

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Eureka Westside Stormwater City/County: Eureka, Humboldt Sampling Date: 5/11/2021

Applicant/Owner: GHD for City of Eureka State: CA Sampling Point: WIT1-W

Investigator(s): Rose E. Dana, Kerry McNamee Section, Township, Range: North of S28, T5N, R1W

Landform (hillslope, terrace, etc.): urban drainage Local relief (concave, convex, none): convex Slope (%): 1

Subregion (LRR): LRR A Lat: 40.79026065 Long: -124.18581249 Datum: WGS84

Soil Map Unit Name: Hydraquents, mucky silt loam, strongly saline, 0-1% NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___ No X	Is the Sampled Area within a Wetland? Yes X No ___
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks:
Problematic vegetation.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5 feet)			
1. Hedra helix	10		FACU
2. Anthoxanthum ordoratum	55	X	FACU
3. Malus pumila	10.		UPL
4. Vicia sativa	2		UPL
5. Symphyotrichum chilense	1		FAC
6. Fornicunlum vulgare	2		UPL
7. Geranium dissectum	2		UPL
8. Rumex Crispus	2		FAC
9. Baccharis pilularis	2		UPL
10. Rubus armeniacus	15		FAC
11.			
= Total Cover	101		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	0	x 2 = 0
FAC species	18	x 3 = 54
FACU species	65	x 4 = 260
UPL species	18	x 5 = 75
Column Totals:	101 (A)	389 (B)

Prevalence Index = B/A = 3.85

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks:
FAC NEUTRAL = 0:1, FAILED, Baccharis pilularis is < 3.2 ft tall & < 3.0" DBH

SOIL

5/11/21 11220813

Sampling Point: W1-T1-W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-5	2.5Y3/2	100					sandy loam	
5-13	5Y 4/2	90%	10YR5/8	10%	C	M	Sandy clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes ✓ No ___

Remarks:
- Alphaalpha-positive
- Redox noticeable in lower horizon
- Glass present

HYDROLOGY

100' to transect boundary

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes X No ~~X~~

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: concrete/rock out crop covered w/ivy. depression below it that settles + ~~drains~~ infiltrates, west of it (towards park)

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: EUREKA WESTSIDE STORMWATER City/County: EUREKA, HUMBOLDT Sampling Date: 5/11/2021

Applicant/Owner: GHD FOR CITY OF EUREKA State: CA Sampling Point: WIT1-U

Investigator(s): ROSE E. DANA, KERRY McNAMEE Section, Township, Range: North of S28, T5N, R1W

Landform (hillslope, terrace, etc.): URBAN DRAINAGE Local relief (concave, convex, none): Convex Slope (%): 2

Subregion (LRR): LRR A Lat: 40.79026065 Long: -124.1858124 Datum: WGS 84

Soil Map Unit Name: Hydraquents, mucky silt loam, strongly saline, 0-1% NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology X naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			

Sapling/Shrub Stratum (Plot size: ____)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
= Total Cover			

Herb Stratum (Plot size: 5 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1. Hedra Helix	10		FACU
2. Arthoxanthum ordoratum	25	X	FACU
3. Vicia sativa	1		UPL
4. Rubus armeniacus	10		FAC
5. Geranium dissectum	2		UPL
6. Symphyotrichum chilense	2		FAC
7. Bromus hordeaceus	2		FAC
8. Bromus diandrus	15		UPL
9. Foeniculum vulgare	25	X	UPL
10. Baccharis pilularis	1		UPL
11.			
= Total Cover	104		

Woody Vine Stratum (Plot size: ____)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	0	x 2 = 0
FAC species	27	x 3 = 81
FACU species	35	x 4 = 140
UPL species	44	x 5 = 220
Column Totals:	106 (A)	441 (B)

Prevalence Index = B/A = 4.16

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:
FAC NEUTRAL TEST = 0:2 (WET:UPL) FAILED, Baccharis pilularis is <3.2 ft tall, <3.0" DBH

5/11/21 11220813

SOIL

Sampling Point: WI-T1-U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-13	2.5Y3/2	100%	—		—		gravelly sandy loam	(many gravels

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

HYDROLOGY

56" to Transect Wetland Boundary

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: EUREKA WESTSIDE STORMWATER City/County: EUREKA, HUMBOLDT Sampling Date: 5/11/2021

Applicant/Owner: GHD FOR CITY OF EUREKA State: CA Sampling Point: WZTI - W

Investigator(s): ROSE E. DANA, KERRY McNAMEE Section, Township, Range: North of 528, T5N, R1W

Landform (hillslope, terrace, etc.): TIDALLY INFLUENCED Local relief (concave, convex, none): toe of slope Slope (%): 2

Subregion (LRR): LRR A Lat: 40.789459 Long: -124.185573 Datum: WGS 84

Soil Map Unit Name: Hydraquents, mucky silt loam, strongly saline, 0-1% NWI classification: E2EM1N

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	Is the Sampled Area within a Wetland? Yes X No ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5 FEET)			
1. Salicornia pacifica	12		OBL
2. Spartina densiflora	85	X	OBL
3. Eleocharis macrostachya	2		OBL
4. Triglochin maritima	1		OBL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
= Total Cover	100		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			
% Bare Ground in Herb Stratum ____			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	100	x 1 = 100
FACW species	0	x 2 = 0
FAC species	0	x 3 = 0
FACU species	0	x 4 = 0
UPL species	0	x 5 = 0
Column Totals:	100 (A)	100 (B)

Prevalence Index = B/A = 1

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

FAC NEUTRAL = 1:0, PASSED

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SOIL

Sampling Point: W2-T1-W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR/2/1	100	—	—	—	—	Silty clay loam	
4-12	Gley1 3/10Y	100%	—	—	—	—	Silty clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- X Hydrogen Sulfide (A4)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- __ 2 cm Muck (A10)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____

Depth (inches): ____

Hydric Soil Present? Yes X No ____

Remarks: Grey + stinky sulfur on bottom

wetland hole to 56" to Transect / 70" from upland pit to transect

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- X Water Marks (B1)
- X Sediment Deposits (B2)
- X Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Surface Soil Cracks (B6)
- X Inundation Visible on Aerial Imagery (B7)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- __ Salt Crust (B11)
- __ Aquatic Invertebrates (B13)
- X Hydrogen Sulfide Odor (C1)
- __ Oxidized Rhizospheres along Living Roots (C3)
- __ Presence of Reduced Iron (C4)
- __ Recent Iron Reduction in Tilled Soils (C6)
- __ Stunted or Stressed Plants (D1) (**LRR A**)
- __ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- __ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- X Drainage Patterns (B10)
- __ Dry-Season Water Table (C2)
- __ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- __ Shallow Aquitard (D3)
- __ FAC-Neutral Test (D5)
- __ Raised Ant Mounds (D6) (**LRR A**)
- __ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes X No ____ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): ____

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Standing water ~~on~~ present nearby

Remarks: Strong sulfur smell

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: EUREKA WESTSIDE STORMWATER City/County: EUREKA, HUMBOLDT Sampling Date: 5/11/2021

Applicant/Owner: GHD FOR CITY OF EUREKA State: CA Sampling Point: W2T1-U

Investigator(s): ROSE E. DANA, KERRY McNAMEE Section, Township, Range: North of S28, T5N, R1W

Landform (hillslope, terrace, etc.): NEAR TRAIL, URBAN Local relief (concave, convex, none): CONVEX Slope (%): 1

Subregion (LRR): LRR A Lat: 40.789459 Long: -124.185573 Datum: WGS 84

Soil Map Unit Name: Hydraquents, mucky silt loam, strongly saline, 0-1% NWI classification: E2EM1N

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___ No X	Is the Sampled Area within a Wetland? Yes ___ No X
Hydric Soil Present?	Yes ___ No X	
Wetland Hydrology Present?	Yes ___ No X	

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5 FEET)			
1. Vicia sativa	15		UPL
2. Anthoxanthum ordoratum	25	X	FACU
3. Hypochaeris radicata	25	X	FACU
4. Medicago polymorpha	10		FACU
5. Plantago lanceolata	5		FACU
6. Foeniculum vulgare	1		UPL
7. Raphanus raphanistrum	1		UPL
8. Symphyotrichum chilense	1		FAC
9. Bromus hordeaceous	1		FAC
10. Rubus armeniacus	1		FAC
11.			
= Total Cover	85		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
= Total Cover			
% Bare Ground in Herb Stratum ___			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	0	x 2 = 0
FAC species	3	x 3 = 9
FACU species	65	x 4 = 260
UPL species	17	x 5 = 85
Column Totals:	85 (A)	354 (B)

Prevalence Index = B/A = 4.16

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ___

Remarks:

FAC NEUTRAL= 0:2, FAILED

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SOIL

Sampling Point: W2-T1-V

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-10	2.5Y3/2	100%	—	—	—	—	Sandy loam	—

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ___ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ______

Water Table Present? Yes ___ No X Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ______

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: EUREKA WESTSIDE STORMWATER City/County: EUREKA, HUMBOLDT Sampling Date: 5/11/2021
Applicant/Owner: GHD FOR CITY OF EUREKA State: CA Sampling Point: W3T1-W
Investigator(s): ROSE E. DANA, KERRY MCNAMEE Section, Township, Range: North of S28, T5N, R1W
Landform (hillslope, terrace, etc.): SWALE, urban Local relief (concave, convex, none): CONCAVE Slope (%): 1
Subregion (LRR): LRR A Lat: 40.789399 Long: -124.183961 Datum: WGS 84
Soil Map Unit Name: Urban land-Anthraltic xerorthents assoc., 0-2% slope NWI classification: PSS1C
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	Is the Sampled Area within a Wetland? Yes X No ___
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix lasiandra var. lasiandra	35	X	FACW
2. Alnus rubra	25	X	FAC
3.			
4.			
= Total Cover	60		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5 ft)			
1. Eleocharis macrostachya	20	X	OBL
2. Equisetum arvense	5		FAC
3. Oenanthe sarmentosa	10		OBL
4. Ranunculus repens	10		FAC
5. Scirpus microcarpus	15	X	OBL
6. Triglochin maritima	5		OBL
7.			
8.			
9.			
10.			
11.			
= Total Cover	65		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	50	x 1 = 50
FACW species	35	x 2 = 70
FAC species	40	x 3 = 120
FACU species	0	x 4 = 0
UPL species	0	x 5 = 0
Column Totals:	125 (A)	240 (B)

Prevalence Index = B/A = 1.92

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ___

Remarks:

FAC NEUTRAL = 3:0, PASSED

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SOIL

Sampling Point: W3-T1-W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3.5	7.5YR2.5/1	100					loam	
3.5-15	5Y 4/1	40%	7.5YR4/6	60%	C	M	loamy sand	tie-dye looking redox

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes X No ___

Remarks:
-checked soil at pathway to culvert → great redox present, and saturated.
18ft to wet del transect.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- X Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- X Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ______

Water Table Present? Yes ___ No X Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 15

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: EUREKA WESTSIDE STORMWATER City/County: EUREKA, HUMBOLDT Sampling Date: 5/11/2021

Applicant/Owner: GHD FOR CITY OF EUREKA State: CA Sampling Point: W3T1-4

Investigator(s): ROSE E DANA KERRY McNAMEE Section, Township, Range: North of S28, T5N, R1W

Landform (hillslope, terrace, etc.): URBAN, ROADSIDE Local relief (concave, convex, none): CONVEX Slope (%): 2

Subregion (LRR): LRR A Lat: 40.789399 Long: -124.183961 Datum: WGS84

Soil Map Unit Name: Urban land-Anthraltic xerorthents assoc. 0-2% NWI classification: PSS1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	Is the Sampled Area within a Wetland?	Yes ____ No X
Hydric Soil Present?	Yes ____ No X		
Wetland Hydrology Present?	Yes ____ No X		

Remarks:
Edge of wetland, near road (<3 feet)

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix lasiolepis	10	X	FACW
2. Salix hookeriana	10	X	FACW
3.			
4.			
	20 = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft)			
1. Anthoxanthum ordoratum	65	X	FAC
2. Rubus ursinus	2		FACU
3. Holcus lanatus	15	X	FAC
4. Allium triquetrum	2		UPL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	84 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	20	x 2 = 20
FAC species	80	x 3 = 225
FACU species	2	x 4 = 8
UPL species	2	x 5 = 10
Column Totals:	104 (A)	263 (B)

Prevalence Index = B/A = 2.52

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- X Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:
FAC NEUTRAL= 2:0, PASSED, OVERSTORY IS FROM ADJACENT WETLAND, BUT SOILS ARE UPLAND

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SOIL

Sampling Point: W3-T1-U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2/1	100					Sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- __ 2 cm Muck (A10)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):
Type: ______
Depth (inches): ______

Hydric Soil Present? Yes ____ No X

Remarks:

9 ft to wet del transect.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Surface Soil Cracks (B6)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- __ Salt Crust (B11)
- __ Aquatic Invertebrates (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Oxidized Rhizospheres along Living Roots (C3)
- __ Presence of Reduced Iron (C4)
- __ Recent Iron Reduction in Tilled Soils (C6)
- __ Stunted or Stressed Plants (D1) **(LRR A)**
- __ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- __ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- __ Drainage Patterns (B10)
- __ Dry-Season Water Table (C2)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ Shallow Aquitard (D3)
- __ FAC-Neutral Test (D5)
- __ Raised Ant Mounds (D6) **(LRR A)**
- __ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____
Water Table Present? Yes ____ No X Depth (inches): ____
Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: EUREKA WESTSIDE STORMWATER City/County: EUREKA, HUMBOLDT Sampling Date: 5/11/2021

Applicant/Owner: GHD for CITY OF EUREKA State: CA Sampling Point: W4 T1 - W

Investigator(s): ROSE E. DANA, KERRY McNAMEE Section, Township, Range: North of S28, T5N, R1W

Landform (hillslope, terrace, etc.): SWALE, urban Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): LRR A Lat: 40.789263 Long: -124.184191 Datum: WGS 84

Soil Map Unit Name: Urban land-Anthraltic Xerorthents assoc, 0-2% slope NWI classification: E2EM1N

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	Is the Sampled Area within a Wetland? Yes X No ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks: Near culvert outlet, freshwater drainage

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix lasiolepis	50	X	FACW
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ____)			
1. Eleocharis macrostachya	35	X	OBL
2. Potentilla anserina	5		OBL
3. Triglochin maritima	20	X	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
= Total Cover	60		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			
% Bare Ground in Herb Stratum ____			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	60	x 1 = 60
FACW species	50	x 2 = 100
FAC species	0	x 3 = 0
FACU species	0	x 4 = 0
UPL species	0	x 5 = 0
Column Totals:	110 (A)	160 (B)

Prevalence Index = B/A = 1.45

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ 5 - Wetland Non-Vascular Plants[1]

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: FAC NEUTRAL = 3:0, PASSED,

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SOIL

Sampling Point: W4-T1-W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-15	2.5Y 3/2	100%	—				Silt	extremely wet + mucky

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- X Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ✓ No ___

Remarks:

extremely wet + mucky; some sulfur smell present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- X Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)** (check for W3-T1-W too)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes X	No ___	Depth (inches): 15"
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 3"

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: water table puddling slightly @ 15"

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: EUREKA WESTSIDE STORMWATER City/County: EUREKA, HUMBOLDT Sampling Date: 5/11/2021

Applicant/Owner: GHD for City of Eureka State: CA Sampling Point: W4T1-U

Investigator(s): ROSE F. DANA, KERRY McNAMEE Section, Township, Range: North of S28 T5N, R1W

Landform (hillslope, terrace, etc.): urban slope Local relief (concave, convex, none): sloped Slope (%): 10

Subregion (LRR): LRR A Lat: 40.789263 Long: -124.184191 Datum: WGS84

Soil Map Unit Name: Urban land-Anthraltic Xerorthents assoc., 0-20% NWI classification: E2EM1N

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___ No X	Is the Sampled Area within a Wetland? Yes ___ No X
Hydric Soil Present?	Yes ___ No X	
Wetland Hydrology Present?	Yes ___ No X	

Remarks:
Slope from road towards wetland, Edge of wetland, OVESTORY FROM wetland

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix lasiolepis	35	X	FACW
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5ft)			
1. Foeniculum vulgare	5		UPL
2. Holcus lanatus	2		FAC
3. Vicia sativa	2		UPL
4. Calystegia sepium	5		FAC
5. Bromus diandrus	5		UPL
6. Anthoxanthum ordoratum	45	X	FACU
7. Rubus ursinus	2		FACU
8. Rubus armeniacus	2		FAC
9. Meticago polymorpha	2		UPL
10. Baccharis pilularis	10		UPL
11.			
= Total Cover	80		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	35	x 2 = 70
FAC species	9	x 3 = 27
FACU species	47	x 4 = 188
UPL species	24	x 5 = 120
Column Totals:	115 (A)	405 (B)

Prevalence Index = B/A = 3.52

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks:
FAC NEUTRAL = 1:1, Baccharis pilularis is < 3.2ft tall and < 3.0" DBH

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SOIL

Sampling Point: W4-T1-U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR3/1	100					Sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): ________

Water Table Present? Yes _____ No _____ Depth (inches): ________

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): ________

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Eureka SLR 11220813 City/County: Eureka, Humboldt Sampling Date: 5/27/21
Applicant/Owner: ______ State: CA Sampling Point: WST 1-W
Investigator(s): K. McNamee Section, Township, Range: ______
Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): ______
Subregion (LRR): ______ Lat: ______ Long: ______ Datum: ______
Soil Map Unit Name: ______ NWI classification: ______
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ______ No ______ (If no, explain in Remarks.)
Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes ______ No ______
Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ✓ No ______	Is the Sampled Area within a Wetland?	Yes ______ No ______
Hydric Soil Present? Yes ✓ No ______		
Wetland Hydrology Present? Yes ✓ No ______		

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
	______ = Total Cover		
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	______ = Total Cover		
Herb Stratum (Plot size: 1ft^2)			
1. Salicornia pacifica	95%		OBL
2. Polypogon monspeliensis	5%		FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	______ = Total Cover		

% Bare Ground in Herb Stratum ______

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ______	x 1 = ______
FACW species ______	x 2 = ______
FAC species ______	x 3 = ______
FACU species ______	x 4 = ______
UPL species ______	x 5 = ______
Column Totals: ______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation
✓ 2 - Dominance Test is >50%
__ 3 - Prevalence Index is ≤3.0[1]
__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
__ 5 - Wetland Non-Vascular Plants[1]
__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ______

Remarks:

SOIL

Sampling Point: WST1-W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	5Y2.5/2	100%					silt loam	
2-12	5Y 4/1	98%	5Y6/8	2%	C	M	silty clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): ______

Water Table Present? Yes ___ No ___ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 10%

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: surface water adjacent to pit

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Eureka SLR 11220813 City/County: Eureka / Humboldt Sampling Date: 5/27/21

Applicant/Owner: ______ State: CA Sampling Point: WS T1-U

Investigator(s): K. McNamee Section, Township, Range: ______

Landform (hillslope, terrace, etc.): disturbed area adjacent to trail Local relief (concave, convex, none): ______ Slope (%): ______

Subregion (LRR): ______ Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: ______ NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ______ No ______ (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes ______ No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ______	No X	Is the Sampled Area within a Wetland? Yes ______ No ______
Hydric Soil Present?	Yes ______	No X	
Wetland Hydrology Present?	Yes ______	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 1 ft^2)			
1. Foeniculum vulgare	20%		UPL
2. Anthoxanthum odoratum	15%		FACU
3. Plantago lanceolata	15%		FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
= Total Cover	50%		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
= Total Cover			
% Bare Ground in Herb Stratum ______			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ 5 - Wetland Non-Vascular Plants[1]

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ______ No X

Remarks: vegetation intermixed among gravel

SOIL

Sampling Point: WST1-U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
								Gravel + fill

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

Gravel + Fill adjacent to trail

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes ____ No ____ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No ____ Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

UP

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: EUREKA WESTSIDE STORMWATER City/County: EUREKA, HUMBOLDT Sampling Date: 5/11/2021

Applicant/Owner: GHD for CITY OF EUREKA State: CA Sampling Point: UP11

Investigator(s): ROSE E. DANA KERRY McNAMEE Section, Township, Range: North of S28 T5N, R1W

Landform (hillslope, terrace, etc.): urban, near trail Local relief (concave, convex, none): slightly concave Slope (%): 0

Subregion (LRR): LRR A Lat: 40.788654 Long: -124.186070 Datum: WGS 84

Soil Map Unit Name: Hydraquents mucky silt loam, strongly saline, 0-1% NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___ No X	Is the Sampled Area within a Wetland? Yes ___ No X
Hydric Soil Present?	Yes ___ No X	
Wetland Hydrology Present?	Yes ___ No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5 ft)			
1. Anthoxanthum ordoratum	35	X	FACU
2. Daucus carota	5		FACU
3. Briza maxima	15		UPL
4. Rubus armeniacus	5		FAC
5. Plantago lanceolata	5		FACU
6. Hypochaeris radicata	10		FACU
7. Holcus lanatus	5		FAC
8. Lotus corniculatus	5		FACU
9. Bromus hordeaceus	5		FAC
10.			
11.			
= Total Cover	90		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	0	x 2 = 0
FAC species	15	x 3 = 45
FACU species	60	x 4 = 240
UPL species	15	x 5 = 75
Column Totals:	90 (A)	360 (B)

Prevalence Index = B/A = 4.0

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks:

FAC NEUTRAL = 0:1, FAILED

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SOIL

Sampling Point: Up1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	7.5YR2.5/3	100					Sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
___ Salt Crust (B11)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Stunted or Stressed Plants (D1) **(LRR A)**
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) **(LRR A)**
___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): ________
Water Table Present? Yes _____ No X Depth (inches): ________
Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): ________

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: EUREKA WESTSIDE STORMWATER City/County: EUREKA, HUMBOLDT Sampling Date: 5/11/2021
Applicant/Owner: GHD FOR CITY OF EUREKA State: CA Sampling Point: UP2
Investigator(s): ROSE E. DANA, KERRY McNAMEE Section, Township, Range: North of S28, T5N, R1W
Landform (hillslope, terrace, etc.): urban, near trail Local relief (concave, convex, none): flat Slope (%): 0%
Subregion (LRR): LRR A Lat: 40.787673 Long: -124.186656 Datum: WGS84
Soil Map Unit Name: Hydraquents mucky silt loam, strongly saline, 0-1% NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	Is the Sampled Area within a Wetland?	Yes ____ No X
Hydric Soil Present?	Yes ____ No X		
Wetland Hydrology Present?	Yes ____ No X		

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5 ft)			
1. Avena barbata	15		UPL
2. Plantago lanceolata	10		FACU
3. Briza maxima	5		UPL
4. Daucus carota	5		FACU
5. Trifolium dubium	10		FACU
6. Bromus diandrus	20	X	UPL
7. Foeniculum vulgare	2		UPL
8. Briza minor	2		FAC
9. Hypochaeris radicata	10		FACU
10. Bromus hordeaceus	10		FAC
11. Raphanus sativus	5		UPL
= Total Cover	94		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			
% Bare Ground in Herb Stratum ____			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	0	x 2 = 0
FAC species	12	x 3 = 36
FACU species	35	x 4 = 140
UPL species	47	x 5 = 235
Column Totals:	94 (A)	411 (B)

Prevalence Index = B/A = 4.37

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

FAC NEUTRAL= 0:1, FAILED

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SOIL

Sampling Point: Up-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR2/2	100					Sandy loam	Extremely gravelly

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes ____ No X Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Eureka Westside Stormwater City/County: Eureka, Humboldt Sampling Date: 5/11/2021

Applicant/Owner: GHD for City of Eureka State: CA Sampling Point: UP3

Investigator(s): Rose E. Dana, Kerry McNamee Section, Township, Range: North of S28, T5N, R1W

Landform (hillslope, terrace, etc.): Urban ditch Local relief (concave, convex, none): Concave Slope (%): 1

Subregion (LRR): LRR A Lat: 40.789574 Long: -124.185623 Datum: WGS84

Soil Map Unit Name: Hydraquents mucky silt loam, strongly saline, 0-1% NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X
Hydric Soil Present?	Yes ____	No X
Wetland Hydrology Present?	Yes ____	No X

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft)			
1. Morella californica	35	X	FACW
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5 ft)			
1. Festuca arundinacea	45	X	FAC
2. Briza maxima	5		UPL
3. Anthoxanthum ordoratum	25	X	FACU
4. Atriplex prostrata	25	X	FAC
5. Hedra helix	15		FACU
6. Vicia sativa	2		UPL
7. Foeniculum vulgare	1		UPL
8. Hordeum marinum	5		FACU
9. Bromus hordeacous	2		FAC
10. Raphanus sativus	1		UPL
11. Medicago polymorpha	2		FACU
= Total Cover	128		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	35	x 2 = 70
FAC species	72	x 3 = 216
FACU species	47	x 4 = 188
UPL species	9	x 5 = 45
Column Totals:	163 (A)	519 (B)

Prevalence Index = B/A = 3.18

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ 5 - Wetland Non-Vascular Plants[1]
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

FAC NEUTRAL = 1:1, overstory

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SOIL

Sampling Point: UP3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/1	90	—	—	—	—	Silty loam	10% organic material
6-16	7.5YR 3/1	90%						10% organic

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ___ No X

Remarks: patches of red soil, initially mistaken for redox → but actually o.m.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ______

Water Table Present? Yes ___ No X Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ______

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: EUREKA SLR City/County: EUREKA / HUMBOLDT Sampling Date: 7/26/2021

Applicant/Owner: GHD for City of EUREKA State: CA Sampling Point: UP 100

Investigator(s): Rose E. Dana Section, Township, Range: T5N R1W

Landform (hillslope, terrace, etc.): FLAT Local relief (concave, convex, none): none Slope (%): 0.5

Subregion (LRR): LRR A Lat: 40.798454 Long: -124.179075 Datum: WGS 84

Soil Map Unit Name: URBAN LAND-ANTHRALTIC XEROTHENTS Assoc, 0-2% slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

Remarks:

SUBURBAN LANDSCAPE NEAR STORMWATER CHANNEL.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: 5 m)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 1 m)			
1. Foeniculum vulgare	23	Y	UPL
2. Briza maxima	15		UPL
3. Dactylis glomerata	5		FACU
4. Festuca myuros	18	Y	UPL
5. Rubus armeniacus	20	Y	FAC
6. Hypochaeris radicata	5		FAC
7. Daucus carota	2		FACU
8. Lotus corniculatus	2		FAC
9. Holcus lanatus	2		FAC
10. Plantago lanceolata	5		FACU
11.			
= Total Cover	90		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	29	x 3 =	87
FACU species	11	x 4 =	44
UPL species	46	x 5 =	230
Column Totals:	86 (A)		361 (B)

Prevalence Index = B/A = 4.2

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: UP100

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 2/3	100					SAND	very gravelly
4-13	10YR 2/3	100					Rock/SAND	extremely compacted

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
___ Salt Crust (B11)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Stunted or Stressed Plants (D1) (**LRR A**)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)
___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes ____ No X Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____

Wetland Hydrology Present? Yes ____ No X

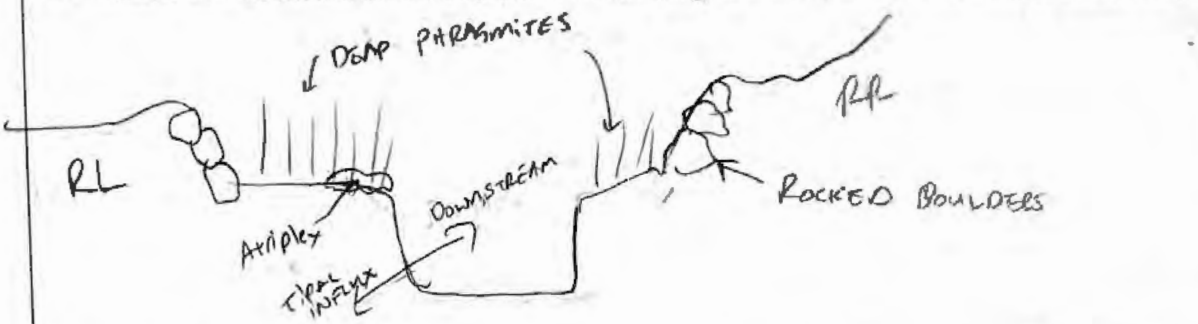
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

ROSE E DANA EUREKA SLR 7/26/2021

Datasheet # 001 **OHWM Delineation Datasheet** Page 1 of 1

Transect (cross-section) drawing: (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length)



Break in Slope at OHWM: ☒ Sharp (> 60°) | ☐ Moderate (30–60°) | ☐ Gentle (< 30°) | ☐ None

Notes/Description:

Sediment Texture: Estimate percentages to describe the general sediment texture above and below the OHWM

	Clay/Silt <0.05mm	Sand 0.05 – 2mm	Gravel 2mm – 1cm	Cobbles 1 – 10cm	Boulders >10cm	Developed Soil Horizons (Y/N)
Above OHWM	0	55	35	10	10	Y
Below OHWM	20	0	0	0	80	N

Notes/Description:
MUCK IN THE CHANNEL, GRAVELLY SAND ABOVE OHWM.

Vegetation: Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	0	25	50	15
Below OHWM	0	0	18	82

Notes/Description:
BELOW OHWM: GROWING IN THE CHANNEL DEPOSITS IS PHRAGMITES AUSTRALIS (COMMON REED, FACW), MOST OF WHICH IS DEAD, AND ATRIPLEX PROSTRATA (FAT-HEN, FAC), WHICH IS NEW GROWTH FROM THIS SEASON. ABOVE OHWM SEE UPLAND DATA SHEET.

Other Evidence: List/describe any additional field evidence and/or lines of reasoning used to support your delineation

HIGH WATER MARKS WER VISABLE ON BAULDERS AND CULVERT.

THIS IS A ROCKED STORMWATER / TIDAL CHANNEL. THERE IS A LARGE CEMENT CULVERT AT THE ENTRANCE & THERE HAS BEEN A BUILDUP OF SILT & PLANT MATTER ON THE SIDES OF THE ROCKED CHANNEL, THERE IS SOME EVIDENCE OF DEPLETIONS BUT NO CONCENTRATIONS OF REDOX AND THE CHANNEL IS TOO DISTURBED FOR WETLAND SOIL DEVELOPMENT.

CLASSIFIED AS RIVERINE IN NWI - R3UBF

Appendix C – On-site Plant List

Scientific Name	Common Name	Status	Family	Status
Achillea millefolium	Yarrow	native	Asteraceae	FACU
Agrostis stolonifera	Redtop	invasive non-native	Poaceae	FAC
Aira caryophyllea	Silvery hairgrass	non-native	Poaceae	FACU
Allium triquetrum	White flowered onion	non-native	Alliaceae	UPL
Anthoxanthum odoratum	Sweet vernal grass	invasive non-native	Poaceae	FACU
Artemisia douglasiana	California mugwort	native	Asteraceae	FACW
Atriplex prostrata	Fat-hen	non-native	Chenopodiaceae	FAC
Avena barbata	Slim oat	invasive non-native	Poaceae	UPL
Avena fatua	Wildoats	invasive non-native	Poaceae	UPL
Baccharis pilularis	Coyote brush	native	Asteraceae	UPL
Bellardia trixago	Mediterranean lineseed	invasive non-native	Orobanchaceae	UPL
Berberis aquifolium	Mountain grape	native	Berberidaceae	UPL
Bolboschoenus maritimus	Alkali bulrush	native	Cyperaceae	UPL
Briza maxima	Rattlesnake grass	invasive non-native	Poaceae	UPL
Briza minor	Little rattlesnake grass	non-native	Poaceae	FAC
Bromus diandrus	Ripgut brome	invasive non-native	Poaceae	UPL
Bromus hordeaceus	Soft chess	invasive non-native	Poaceae	FACU
Bromus sitchensis var. carinatus	California brome	native	Poaceae	UPL
Buddleja davidii	Butterfly bush	invasive non-native	Scrophulariaceae	FACU
Cakile maritima	Sea rocket	invasive non-native	Brassicaceae	FACU
Calamagrostis nutkaensis	Reedgrass	native	Poaceae	FACW
Calystegia sepium	Hedge bindweed	native	Convolvulaceae	FAC
Cardamine hirsuta	Hairy bitter cress	non-native	Brassicaceae	FACU
Cerastium glomeratum	Large mouse ears	non-native	Caryophyllaceae	FACU
Conium maculatum	Poison hemlock	invasive non-native	Apiaceae	FAC
Cornus sericea	American dogwood	native	Cornaceae	UPL
Cortaderia jubata	Andean pampas grass	invasive non-native	Poaceae	FACU
Cotoneaster lacteus	Milkflower cotoneaster	invasive non-native	Rosaceae	UPL
Cotula coronopifolia	Brass buttons	invasive non-native	Asteraceae	OBL
Cuscuta salina	Saltmarsh dodder	native	Convolvulaceae	UPL
Cynosurus echinatus	Dogtail grass	invasive non-native	Poaceae	UPL
Cyperus eragrostis	Tall cyperus	native	Cyperaceae	FACW
Dactylis glomerata	Orchardgrass	invasive non-native	Poaceae	FACU
Daucus carota	Carrot	non-native	Apiaceae	FACU
Dipsacus fullonum	Wild teasel	invasive non-native	Dipsacaceae	FAC
Distichlis spicata	Salt grass	native	Poaceae	FACW
Eleocharis macrostachya	Spike rush	native	Cyperaceae	UPL
Elymus glaucus	Blue wildrye	native	Poaceae	FACU
Epilobium ciliatum	Slender willow herb	native	Onagraceae	FACW

Scientific Name	Common Name	Status	Family	Status
Equisetum arvense	Common horsetail	native	Equisetaceae	FAC
Equisetum telmateia	Giant horsetail	native	Equisetaceae	FACW
Erodium cicutarium	Coastal heron's bill	invasive non-native	Geraniaceae	UPL
Eschscholzia californica	California poppy	native	Papaveraceae	UPL
Festuca arundinacea	Reed fescue	invasive non-native	Poaceae	UPL
Festuca perennis	Italian rye grass	invasive non-native	Poaceae	UPL
Foeniculum vulgare	Fennel	invasive non-native	Apiaceae	UPL
Galium aparine	Cleavers	native	Rubiaceae	FACU
Galium trifidum	three petaled bedstraw	native	Rubiaceae	FACW
Genista monspessulana	French broom	invasive non-native	Fabaceae	UPL
Geranium dissectum	Wild geranium	invasive non-native	Geraniaceae	UPL
Geranium molle	Crane's bill geranium	non-native	Geraniaceae	UPL
Grindelia stricta var. stricta	Coastal gum plant	native	Asteraceae	UPL
Hedera helix	English ivy	invasive non-native	Araliaceae	FACU
Hirschfeldia incana	Mustard	invasive non-native	Brassicaceae	UPL
Holcus lanatus	Common velvetgrass	invasive non-native	Poaceae	FAC
Hordeum brachyantherum	Meadow barley	native	Poaceae	FACW
Hordeum murinum	Foxtail barley	invasive non-native	Poaceae	FAC
Hypericum perforatum	Klamathweed	invasive non-native	Ericaceae	FACU
Hypochaeris radicata	Hairy cats ear	invasive non-native	Asteraceae	FACU
Jaumea carnosa	Marsh jaumea	native	Asteraceae	OBL
Juncus bufonius	Common toad rush	native	Juncaceae	FACW
Juncus hesperius	Coast or bog rush	native	Juncaceae	UPL
Juncus lescurii	Dune rush	native	Juncaceae	FACW
Lepidium didymum	Lesser swine cress	non-native	Brassicaceae	UPL
Limonium californicum	Marsh rosemary	native	Plumbaginaceae	OBL
Linum bienne	Flax	non-native	Linaceae	UPL
Lipocarpha micrantha	Small flowered hemicarpha	Native	Cyperaceae	OBL
Lonicera involucrata	Coast twinberry	native	Caprifoliaceae	FAC
Lotus corniculatus	Bird's foot trefoil	non-native	Fabaceae	FAC
Lupinus arboreus x	Coastal bush lupine	native	Fabaceae	UPL
Lupinus bicolor	Lupine	native	Fabaceae	UPL
Lysimachia arvensis	Scarlet pimpernel	non-native	Myrsinaceae	FAC
Malus pumila	Paradise apple	non-native	Rosaceae	UPL
Malva neglecta	Dwarf mallow	non-native	Malvaceae	UPL
Matricaria discoidea	Pineapple weed	native	Asteraceae	FACU
Medicago polymorpha	California burclover	invasive non-native	Fabaceae	FACU
Medicago sativa	Alfalfa	non-native	Fabaceae	UPL
Morella californica	California wax myrtle	native	Myricaceae	FACW
Oenanthe sarmentosa	Water parsley	native	Apiaceae	OBL

Scientific Name	Common Name	Status	Family	Status
Parapholis incurva	Sickle grass	non-native	Poaceae	FACU
Parentucellia viscosa	Yellow parentucellia	invasive non-native	Orobanchaceae	FAC
Philadelphus lewisii	Wild mock orange	native	Hydrangeaceae	UPL
Physocarpus capitatus	Ninebark	native	Rosaceae	FACW
Pinus contorta ssp. contorta	Shore pine	native	Pinaceae	UPL
Plantago coronopus	Cut leaf plantain	non-native	Plantaginaceae	FAC
Plantago lanceolata	Ribwort	invasive non-native	Plantaginaceae	FACU
Poa annua	Annual blue grass	non-native	Poaceae	FAC
Poa pratensis	Kentucky blue grass	invasive non-native	Poaceae	FAC
Poa secunda	Pine bluegrass	native	Poaceae	FACU
Polygonum aviculare	Prostrate knotweed	non-native	Polygonaceae	FAC
Polypogon monspeliensis	Annual beard grass	invasive non-native	Poaceae	FACW
Polystichum munitum	Western sword fern	native	Dryopteridaceae	FACU
Potentilla anserina	Silver weed cinquefoil	native	Rosaceae	OBL
Ranunculus repens	Crowfoot, creeping buttercup	invasive non-native	Ranunculaceae	FAC
Raphanus raphanistrum	Jointed charlock	non-native	Brassicaceae	UPL
Raphanus sativus	Jointed charlock	invasive non-native	Brassicaceae	UPL
Rosa nutkana	Nootka rose	native	Rosaceae	FAC
Rubus armeniacus	Himalayan blackberry	invasive non-native	Rosaceae	FAC
Rubus ursinus	California blackberry	native	Rosaceae	FACU
Rumex acetosella	Sheep sorrel	invasive non-native	Polygonaceae	FACU
Rumex crispus	Curly dock	invasive non-native	Polygonaceae	FAC
Salicornia pacifica	Pickleweed	native	Chenopodiaceae	UPL
Salix hookeriana	Coastal willow	native	Salicaceae	FACW
Salix lasiandra	Pacific willow	native	Salicaceae	FACW
Salix lasiolepis	Arroyo willow	native	Salicaceae	FACW
Scirpus microcarpus	Mountain bog bulrush	native	Cyperaceae	OBL
Sonchus asper	Spiny sowthistle	non-native	Asteraceae	FACU
Spartina densiflora	Dense flowered cord grass	invasive non-native	Poaceae	OBL
Spergularia marina	Salt sand spurry	native	Caryophyllaceae	OBL
Spiraea douglasii	Douglas spiraea	native	Rosaceae	FACW
Stachys rigida	Rough hedgenettle	native	Lamiaceae	FACW
Stellaria media	Chickweed	non-native	Caryophyllaceae	FACU
Symphyotrichum chilense	Pacific aster	native	Asteraceae	FAC
Tragopogon porrifolius	Salsify	non-native	Asteraceae	UPL
Trifolium campestre	Hop clover	non-native	Fabaceae	UPL
Trifolium dubium	Shamrock	non-native	Fabaceae	FACU
Trifolium hirtum	Rose clover	invasive non-native	Fabaceae	UPL
Triglochin maritima	Seaside arrow grass	native	Juncaginaceae	OBL
Triphysaria eriantha	Butter 'n' eggs	native	Orobanchaceae	UPL
Typha latifolia	Broadleaf cattail	native	Typhaceae	OBL

Scientific Name	Common Name	Status	Family	Status
Vicia hirsuta	Hairy vetch	non-native	Fabaceae	UPL
Vicia sativa	Spring vetch	non-native	Fabaceae	UPL
Vicia tetrasperma	Four seeded vetch	non-native	Fabaceae	UPL
Vicia villosa	Hairy vetch	non-native	Fabaceae	UPL

Appendix D – Site Photographs

Photo 1. Conditions in the northeastern portion of the PSB (within Wetland 2 [Palco Marsh]), facing west (5/11/21).

Photo 2. Conditions within Wetland 2 (Palco Marsh), facing northeast (5/27/2021).

Photo 3. Conditions within Wetland 4, facing southwest (5/11/2021)

Photo 4. Downstream culvert within Wetland 4 (5/11/2021).

Photo 5. Conditions at Wetland 5, facing northeast (5/27/2021).

Photo 6. Photo representative of upland habitat conditions, facing south (5/27/2021).

Photo 7. Tidal inlet, facing northwest (5/27/2021).

Photo 8. Tidal inlet, facing southwest (5/27/2021).

Appendix E – NRCS Custom Soil Resource Report

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

Humboldt County, Central Part, California

City of Eureka Flood Reduction and SLR Mitigation Project

May 26, 2021

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map

Map Scale: 1:2,260 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0, 30, 60, 120, 180

Feet: 0, 100, 200, 400, 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Humboldt County, Central Part, California
Survey Area Data: Version 6, Jun 1, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 8, 2019—Jun 21, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1008	Hydraquents mucky silt loam, strongly saline, 0-1 percent slopes, very frequently flooded	7.3	82.9%
1009	Hydraquents-Wassents mucky silt loam, strongly saline, 0-3 percent slopes, very frequently flooded	0.1	1.4%
1014	Urban land-Anthraltic Xerorthents association, 0 to 2 percent slopes	1.4	15.7%
Totals for Area of Interest		**8.9**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Humboldt County, Central Part, California

1008—Hydraquents mucky silt loam, strongly saline, 0-1 percent slopes, very frequently flooded

Map Unit Setting

National map unit symbol: 2t14z
Elevation: 0 to 10 feet
Mean annual precipitation: 35 to 80 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 275 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Hydraquents, high tidal, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hydraquents, High Tidal

Setting

Landform: Tidal marshes
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mucky, silty, and clayey estuarine deposits

Typical profile

Az - 0 to 13 inches: mucky silt loam
Cg1 - 13 to 37 inches: mucky silty clay loam
Cg2 - 37 to 51 inches: mucky silty clay loam
Cgse - 51 to 79 inches: mucky silt loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 0 inches to salic; 20 to 79 inches to sulfuric
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 2.00 in/hr)
Depth to water table: About 0 to 16 inches
Frequency of flooding: Very frequent
Frequency of ponding: None
Maximum salinity: Strongly saline (30.0 to 80.0 mmhos/cm)
Sodium adsorption ratio, maximum: 75.0
Available water capacity: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Minor Components

Hydraquents, low tidal

Percent of map unit: 10 percent

Landform: Channels
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Water, marine

Percent of map unit: 5 percent
Landform: Channels

1009—Hydraquents-Wassents mucky silt loam, strongly saline, 0-3 percent slopes, very frequently flooded

Map Unit Setting

National map unit symbol: 2t150
Elevation: 0 to 10 feet
Mean annual precipitation: 35 to 80 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 275 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Hydraquents, low tidal, and similar soils: 50 percent
Wassents and similar soils: 40 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hydraquents, Low Tidal

Setting

Landform: Tidal flats
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mucky, silty, and clayey estuarine deposits

Typical profile

Czg1 - 0 to 9 inches: mucky silty clay loam
Cg2 - 9 to 16 inches: mucky silty clay loam
Cg3 - 16 to 26 inches: mucky silty clay loam
Cg4 - 26 to 39 inches: mucky silty clay loam
Cg5 - 39 to 59 inches: mucky silty clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 0 inches to salic; 20 to 79 inches to sulfuric
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.01 to 0.06 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Very frequent

Frequency of ponding: None
Maximum salinity: Strongly saline (30.0 to 80.0 mmhos/cm)
Sodium adsorption ratio, maximum: 75.0
Available water capacity: Very low (about 0.0 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: Yes

Description of Wassents

Setting
Landform: Tidal flats
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mucky, silty, and clayey estuarine deposits

Typical profile
Asez - 0 to 6 inches: mucky silt loam
Cg1 - 6 to 14 inches: mucky silty clay loam
Cg2 - 14 to 31 inches: mucky silty clay loam
Cg3 - 31 to 59 inches: mucky silty clay loam

Properties and qualities
Slope: 0 to 1 percent
Depth to restrictive feature: 0 inches to sulfuric; 0 inches to salic
Drainage class: Subaqueous
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Very frequent
Frequency of ponding: Frequent
Maximum salinity: Strongly saline (30.0 to 80.0 mmhos/cm)
Sodium adsorption ratio, maximum: 75.0
Available water capacity: Very low (about 0.0 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: Yes

Minor Components

Water, marine
Percent of map unit: 5 percent
Landform: Channels

Hydraquents, high tidal
Percent of map unit: 5 percent
Landform: Tidal marshes
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

1014—Urban land-Anthraltic Xerorthents association, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2w91f
Elevation: 0 to 10 feet
Mean annual precipitation: 41 to 43 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 275 to 330 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Urban land, industrial: 80 percent
Anthraltic xerorthents and similar soils: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land, Industrial

Setting

Landform: Fluviomarine terraces

Properties and qualities

Slope: 0 to 2 percent
Depth to water table: About 24 inches
Frequency of ponding: Frequent

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: No

Description of Anthraltic Xerorthents

Setting

Landform: Fluviomarine terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy fluviomarine deposits and/or coarse-loamy dredge spoils

Typical profile

A - 0 to 6 inches: gravelly loamy fine sand
^C1 - 6 to 13 inches: sandy loam
^C2 - 13 to 19 inches: sandy loam
^C3 - 19 to 24 inches: sandy loam
^C4 - 24 to 31 inches: sandy loam
^C5 - 31 to 43 inches: gravelly sand

C6 - 43 to 65 inches: sand

Properties and qualities

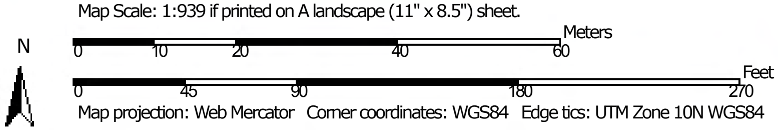
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A/D
Hydric soil rating: No

Soil Map

Map Scale: 1:939 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

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Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Survey Area Data: Version 6, Jun 1, 2020

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The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1014	Urban land-Anthraltic Xerorthents association, 0 to 2 percent slopes	3.3	100.0%
Totals for Area of Interest		**3.3**	**100.0%**

Map Unit Descriptions

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The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

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Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

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An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Humboldt County, Central Part, California

1014—Urban land-Anthraltic Xerorthents association, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2w91f
Elevation: 0 to 10 feet
Mean annual precipitation: 41 to 43 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 275 to 330 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Urban land, industrial: 80 percent
Anthraltic xerorthents and similar soils: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land, Industrial

Setting

Landform: Fluviomarine terraces

Properties and qualities

Slope: 0 to 2 percent
Depth to water table: About 24 inches
Frequency of ponding: Frequent

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: No

Description of Anthraltic Xerorthents

Setting

Landform: Fluviomarine terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy fluviomarine deposits and/or coarse-loamy dredge spoils

Typical profile

A - 0 to 6 inches: gravelly loamy fine sand
^C1 - 6 to 13 inches: sandy loam
^C2 - 13 to 19 inches: sandy loam
^C3 - 19 to 24 inches: sandy loam
^C4 - 24 to 31 inches: sandy loam
^C5 - 31 to 43 inches: gravelly sand
C6 - 43 to 65 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A/D
Hydric soil rating: No

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Appendix F – Record of Climatological Observations and WETS Table

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Current Location: Elev: 20 ft. Lat: 40.8097° N Lon: -124.1602° W

Station: **EUREKA WEATHER FORECAST OFFICE WOODLEY ISLAND, CA US USW00024213**

Record of Climatological Observations

These data are quality controlled and may not be identical to the original observations.

Generated on 05/26/2021

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Observation Time Temperature: Unknown Observation Time Precipitation: 2400

Year	Month	Day	Temperature (F) 24 Hrs. Ending at Observation Time Max.	Temperature (F) 24 Hrs. Ending at Observation Time Min.	At Obs.	Precipitation 24 Hour Amounts Ending at Observation Time Rain, Melted Snow, Etc. (in)	Flag	Snow, Ice Pellets, Hail (in)	Flag	At Obs. Time Snow, Ice Pellets, Hail, Ice on Ground (in)	Evaporation 24 Hour Wind Movement (mi)	Amount of Evap. (in)	Soil Temperature (F) 4 in. Depth Ground Cover (see *)	4 in. Max.	4 in. Min.	8 in. Depth Ground Cover (see *)	8 in. Max.	8 in. Min.
2021	04	01																
2021	04	02																
2021	04	03																
2021	04	04																
2021	04	05																
2021	04	06																
2021	04	07																
2021	04	08																
2021	04	09																
2021	04	10	54	40		0.00		0.0		0.0								
2021	04	11	54	36		0.00		0.0		0.0								
2021	04	12	56	37		0.00		0.0		0.0								
2021	04	13	57	39		0.00		0.0		0.0								
2021	04	14	62	38		0.00		0.0		0.0								
2021	04	15	57	38		0.00		0.0		0.0								
2021	04	16	54	44		0.00		0.0		0.0								
2021	04	17	52	44		0.00		0.0		0.0								
2021	04	18	54	44		0.00		0.0		0.0								
2021	04	19	54	46		0.01		0.0		0.0								
2021	04	20	56	48		0.08		0.0		0.0								
2021	04	21	55	47		0.00		0.0		0.0								
2021	04	22	56	46		0.00		0.0		0.0								
2021	04	23	55	44		0.04		0.0		0.0								
2021	04	24	57	47		0.13		0.0		0.0								
2021	04	25	55	44		0.42		0.0		0.0								
2021	04	26	55	43		0.03		0.0		0.0								
2021	04	27	57	38		0.00		0.0		0.0								
2021	04	28	58	46		0.00		0.0		0.0								
2021	04	29	57	47		0.00		0.0		0.0								
2021	04	30	57	44		0.00		0.0		0.0								
		Summary	56	43		0.71		0.0										

Empty, or blank, cells indicate that a data observation was not reported.

*Ground Cover: 1=Grass; 2=Fallow; 3=Bare Ground; 4=Brome grass; 5=Sod; 6=Straw mulch; 7=Grass muck; 8=Bare muck; 0=Unknown

"s" This data value failed one of NCDC's quality control tests. "At Obs." = Temperature at time of observation

"T" values in the Precipitation or Snow category above indicate a "trace" value was recorded.

"A" values in the Precipitation Flag or the Snow Flag column indicate a multiday total, accumulated since last measurement, is being used.

Data value inconsistency may be present due to rounding calculations during the conversion process from SI metric units to standard imperial units.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Record of Climatological Observations

These data are quality controlled and may not be identical to the original observations.

Generated on 05/26/2021

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Current Location: Elev: 20 ft. Lat: 40.8097° N Lon: -124.1602° W

Station: **EUREKA WEATHER FORECAST OFFICE WOODLEY ISLAND, CA US USW00024213**

Observation Time Temperature: Unknown Observation Time Precipitation: 2400

Year	Month	Day	Temperature (F) 24 Hrs. Ending at Observation Time Max.	Min.	At Obs.	Precipitation 24 Hour Amounts Ending at Observation Time Rain, Melted Snow, Etc. (in)	Flag	Snow, Ice Pellets, Hail (in)	Flag	At Obs. Time Snow, Ice Pellets, Hail, Ice on Ground (in)	Evaporation 24 Hour Wind Movement (mi)	Amount of Evap. (in)	Soil Temperature (F) 4 in. Depth Ground Cover (see *)	Max.	Min.	8 in. Depth Ground Cover (see *)	Max.	Min.
2021	05	01	59	50		0.03		0.0		0.0								
2021	05	02	58	48		0.00		0.0		0.0								
2021	05	03	60	46		0.00		0.0		0.0								
2021	05	04	59	49		0.00		0.0		0.0								
2021	05	05	56	48		0.00		0.0		0.0								
2021	05	06	58	47		0.04		0.0		0.0								
2021	05	07	57	45		0.00		0.0		0.0								
2021	05	08	57	39		0.00		0.0		0.0								
2021	05	09	58	46		0.00		0.0		0.0								
2021	05	10	59	48		0.00		0.0		0.0								
2021	05	11	60	46		0.00		0.0		0.0								
2021	05	12																
2021	05	13																
2021	05	14																
2021	05	15																
2021	05	16																
2021	05	17																
2021	05	18																
2021	05	19																
2021	05	20																
2021	05	21																
2021	05	22																
2021	05	23																
2021	05	24																
2021	05	25																
2021	05	26																
2021	05	27																
2021	05	28																
2021	05	29																
2021	05	30																
2021	05	31																
		Summary	58	47		0.07		0.0										

Empty, or blank, cells indicate that a data observation was not reported.

*Ground Cover: 1=Grass; 2=Fallow; 3=Bare Ground; 4=Brome grass; 5=Sod; 6=Straw mulch; 7=Grass muck; 8=Bare muck; 0=Unknown

"s" This data value failed one of NCDC's quality control tests. "At Obs." = Temperature at time of observation

"T" values in the Precipitation or Snow category above indicate a "trace" value was recorded.

"A" values in the Precipitation Flag or the Snow Flag column indicate a multiday total, accumulated since last measurement, is being used.

Data value inconsistency may be present due to rounding calculations during the conversion process from SI metric units to standard imperial units.

Date	Max Temperature	Min Temperature	Avg Temperature	GDD Base 40	GDD Base 50	Precipitation	Snowfall	Snow Depth
2022-04-18	56	39	47.5	8	0	**0.93**	0	0
2022-04-19	57	42	49.5	10	0	**0.06**	0	0
2022-04-20	61	47	54	14	4	**0.28**	0	0
2022-04-21	60	44	52	12	2	**0.13**	0	0
2022-04-22	57	43	50	10	0	**0.03**	0	0
2022-04-23	54	44	49	9	0	**0**	0	0
2022-04-24	56	45	50.5	11	1	**0**	0	0
2022-04-25	57	44	50.5	11	1	**0**	0	0
2022-04-26	57	43	50	10	0	**0**	0	0
2022-04-27	56	42	49	9	0	**0**	0	0
2022-04-28	57	43	50	10	0	**0.01**	0	0
2022-04-29	58	39	48.5	9	0	**T**	0	0
2022-04-30	59	49	54	14	4	**0.16**	0	0
2022-05-01	58	46	52	12	2	**0**	0	0
2022-05-02	57	45	51	11	1	**0.13**	0	0
2022-05-03	56	42	49	9	0	**0**	0	0
2022-05-04	56	47	51.5	12	2	**0**	0	0
2022-05-05	63	49	56	16	6	**0.25**	0	0
2022-05-06	64	52	58	18	8	**0.09**	0	0
2022-05-07	57	46	51.5	12	2	**0.04**	0	0
2022-05-08	52	42	47	7	0	**0.46**	0	0
2022-05-09	52	40	46	6	0	**0.09**	0	0
2022-05-10	54	36	45	5	0	**0**	0	0
2022-05-11	58	48	53	13	3	**0**	0	0
2022-05-12	58	46	52	12	2	0.01	0	0
2022-05-13	62	53	57.5	18	8	0.16	0	0
2022-05-14	61	51	56	16	6	T	0	0
2022-05-15	64	51	57.5	18	8	0.02	0	0
2022-05-16	58	50	54	14	4	0.03	0	0
2022-05-17	59	50	54.5	15	5	0	0	0
2022-05-18	66	46	56	16	6	0	0	0
Average|Sun	**57**	**44**	**51**	**264**	**15**	**2.88**	**T**	**0**
					last 14 days	**1.15**		

WETS Table

WETS Station: EUREKA WFO WOODLEY ISLAND, CA								
Requested years: 1971 - 2021								
Month	Avg Max Temp	Avg Min Temp	Avg Mean Temp	Avg Precip	30% chance precip less than	30% chance precip more than	Avg number days precip 0.10 or more	Avg Snowfall
Jan	55.3	41.5	48.4	6.05	3.69	7.32	11	0.0
Feb	55.8	42.2	49.0	5.41	3.39	6.53	10	0.1
Mar	56.3	43.1	49.7	5.65	3.89	6.74	11	0.0
Apr	57.4	44.7	51.1	3.17	1.92	3.84	7	0.0
May	59.5	48.0	53.8	1.56	0.73	1.91	4	0.0
Jun	61.8	50.6	56.2	0.65	0.24	0.78	2	0.0
Jul	63.2	52.7	58.0	0.16	0.04	0.16	0	0.0
Aug	64.1	53.4	58.8	0.29	0.06	0.28	1	0.0
Sep	63.9	51.3	57.6	0.83	0.19	0.90	2	0.0
Oct	61.6	47.9	54.8	2.43	0.99	2.95	5	0.0
Nov	58.2	44.1	51.1	5.33	3.28	6.45	10	0.0
Dec	55.1	41.0	48.1	7.17	3.96	8.75	12	0.1
Annual:					32.44	43.71		
Average	59.4	46.7	53.0	-	-	-	-	-
Total	-	-	-	38.70			75	0.2

GROWING SEASON DATES

Years with missing data:	24 deg = 1	28 deg = 1	32 deg = 1
Years with no occurrence:	24 deg = 50	28 deg = 45	32 deg = 2
Data years used:	24 deg = 50	28 deg = 50	32 deg = 50
Probability	24 F or higher	28 F or higher	32 F or higher
50 percent *	No occurrence	No occurrence	2/3 to 12/13: 313 days
70 percent *	No occurrence	No occurrence	1/23 to 12/25: 336 days
* Percent chance of the growing season occurring between the Beginning and Ending dates.			

STATS TABLE - total precipitation (inches)

Yr	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annl
1886												9.78	9.78
1887	8.86	9.00	2.28		3.51	1.92	0.06	0.07	0.21	0.55	2.66	5.43	34.55
1888	12.95	1.98	4.09		0.76	4.66	0.44	0.00	0.06	1.15	3.41	5.93	35.43
1889	4.25	1.93	5.91		7.27	0.37	0.15	0.13	0.32	8.36	3.71	12.88	45.28
1890	18.26	13.88	11.57	1.43	1.71	0.90	0.08	0.02	0.79	0.44	0.18	5.48	54.74
1891	3.33	9.81	5.83	6.37	1.55	1.53	0.28	0.31	1.45	1.64	2.72	10.97	45.79
1892	3.29	2.53	5.32		3.63	0.45	0.00	0.09	0.99	2.90	8.19	6.55	33.94
1893	3.65	6.27	10.59	2.99	2.43	0.33	0.00	0.00	2.39	4.33	9.87	6.69	49.54

1894	12.38	6.13	7.46	M1.28	1.31	1.67	0.02	0.04	1.84	3.12	2.03	12.31	49.59
1895	9.37	3.60	5.31	2.88	5.39	0.06	0.23	0.11	3.14	0.05	3.88	7.50	41.52
1896	8.14	4.61	6.93	6.88	6.22	0.51	0.00	0.70	1.60	2.37	8.00	9.41	55.37
1897	3.04	11.23	9.85	1.36	0.75	1.60	0.03	0.15	1.05	2.63	5.44	6.18	43.31
1898	3.23	8.00	1.80	1.82	2.62	1.21	0.00	0.06	1.48	2.13	4.43	3.17	29.95
1899	6.50	5.03	8.53	1.91	1.73	0.75	0.00	0.42	0.88	4.28	14.80	7.05	51.88
1900	6.63	6.04	3.42	4.43	2.08	1.70	T	0.07	0.21	7.07	8.01	5.27	44.93
1901	9.93	7.41	3.86	4.08	1.50	0.12	0.03	T	4.26	2.46	3.96	4.43	42.04
1902	1.95	19.49	7.85	4.56	2.70	0.27	0.25	T	0.14	2.34	10.88	8.33	58.76
1903	16.07	3.80	7.42	1.23	0.70	0.57	0.06	0.53	0.28	2.42	10.79	4.03	47.90
1904	5.24	16.10	19.05	5.14	1.02	0.55	0.75	T	1.36	2.67	4.41	8.18	64.47
1905	4.81	0.99	7.41	0.78	1.99	0.12	0.02	0.00	0.38	1.50	3.93	4.32	26.25
1906	7.63	6.27	7.72	2.14	3.57	1.56	0.01	0.01	0.76	0.67	3.13	7.59	41.06
1907	10.40	10.57	11.83	3.30	1.69	0.58	T	2.66	0.63	1.48	2.38	8.59	54.11
1908	7.23	6.59	2.82	0.85	2.57	0.19	T	0.16	0.02	5.09	3.97	3.91	33.40
1909	14.41	11.54	2.72	0.24	0.76	0.14	0.55	T	0.61	3.78	12.60	4.29	51.64
1910	7.26	7.33	1.97	0.83	0.64	0.49	0.00	0.00	0.01	0.82	6.86	3.43	29.64
1911	8.63	3.75	1.45	3.39	3.52	0.23	T	0.08	0.29	1.68	2.09	4.74	29.85
1912	10.17	5.73	4.73	5.92	1.98	1.29	0.05	0.04	2.40	1.55	6.86	5.83	46.55
1913	8.10	0.87	3.61	3.41	1.67	1.60	0.28	0.03	0.48	0.88	5.29	7.58	33.80
1914	9.75	4.20	3.13	3.27	0.70	1.73	0.01	T	1.82	3.79	2.42	7.09	37.91
1915	9.75	12.39	1.65	1.38	2.07	0.05	0.26	0.00	0.11	0.79	6.15	5.19	39.79
1916	13.02	5.18	4.83	1.98	1.48	1.00	1.34	0.12	0.38	0.47	3.13	5.47	38.40
1917	5.53	5.10	5.01	3.78	1.02	0.00	0.00	0.02	0.66	0.00	6.43	1.17	28.72
1918	2.55	6.29	5.84	1.15	0.29	0.02	0.22	0.21	1.42	1.00	4.74	4.29	28.02
1919	7.84	8.18	6.25	4.03	1.48	0.14	0.01	0.01	1.52	0.24	2.99	4.33	37.02
1920	1.87	2.11	5.79	3.12	0.04	1.92	0.13	0.49	2.47	4.11	6.35	10.83	39.23
1921	8.37	7.45	3.04	1.67	2.54	1.30	0.00	0.01	0.27	1.59	6.21	4.48	36.93
1922	2.54	9.75	6.43	2.39	0.95	0.14	0.00	0.03	0.37	3.38	3.32	7.62	36.92
1923	3.88	0.50	0.80	2.95	1.26	1.07	0.03	0.02	1.54	2.55	2.86	4.93	22.39
1924	1.95	3.19	2.85	0.67	0.08	0.05	0.02	1.03	0.41	6.84	6.37	4.07	27.53
1925	3.97	6.49	2.02	7.47	2.57	0.24	T	0.25	3.56	0.95	3.71	4.84	36.07
1926	4.69	6.64	0.07	0.94	1.13	T	0.01	0.54	0.43	3.49	13.65	6.47	38.06
1927	5.83	10.30	3.95	3.32	1.68	0.91	0.00	0.02	0.86	1.17	5.89	3.10	37.03

1928	3.40	2.78	7.01	5.86	0.12	0.32	0.02	0.05	M0.58	2.21	4.90	7.82	35.07
1929	4.31	2.06	2.31	2.61	0.14	2.39	T	0.01	0.00	0.21	T	7.13	21.17
1930	6.32	4.92	1.23	2.54	1.04	0.13	T	T	1.12	1.21	3.20	2.50	24.21
1931	4.09	2.39	3.35	1.61	0.49	1.33	0.01	0.01	0.54	2.28	5.75	9.06	30.91
1932	6.84	1.20	4.54	4.87	1.41	0.11	0.14	0.03	0.01	1.32	5.11	5.54	31.12
1933	7.04	M2.93	7.20	0.97	4.23	0.30	T	0.05	0.70	2.08	0.38	6.50	32.38
1934	3.83	2.31	3.61	1.68	1.23	0.29	T	0.01	0.47	3.98	8.63	5.28	31.32
1935	7.25	2.73	5.60	4.86	0.30	0.27	0.09	T	1.10	3.02	1.35	6.79	33.36
1936	8.84	5.89	1.77	2.13	2.23	1.34	0.09	T	0.04	0.49	0.01	3.97	26.80
1937	4.27	5.41	7.19	6.55	0.88	1.35	0.03	0.05	0.19	4.33	10.95	4.26	45.46
1938	6.28	13.94	13.97	2.23	0.31	0.01	T	T	1.74	3.34	3.12	5.97	50.91
1939	4.49	4.41	5.03	0.37	1.85	0.56	0.23	0.06	0.05	1.82	0.91	12.13	31.91
1940	4.37	9.62	7.47	0.81	2.54	0.32	0.00	0.00	0.91	4.03	2.29	8.87	41.23
1941	11.37	6.68	4.31	4.49	3.61	1.52	0.06	0.18	0.48	2.64	3.91	12.87	52.12
1942	4.08	6.22	1.77	4.05	5.43	0.57	0.07	0.06	0.06	1.21	8.60	8.52	40.64
1943	5.23	3.51	5.83	3.23	4.25	0.47	0.04	0.21	0.01	4.61	3.59	1.67	32.65
1944	2.92	3.62	2.25	4.25	3.49	1.19	0.10	0.19	0.19	2.79	9.11	5.92	36.02
1945	3.64	9.55	6.03	2.27	3.43	T	T	0.10	1.09	3.38	9.47	9.93	48.89
1946	4.32	5.10	4.68	0.42	1.26	0.30	0.12	0.01	0.32	2.26	4.36	1.56	24.71
1947	3.93	1.33	3.91	1.84	0.17	1.58	1.20	0.10	0.59	6.50	1.72	3.09	25.96
1948	8.23	5.20	6.16	6.53	2.16	0.77	0.25	0.13	1.71	3.33	3.19	7.35	45.01
1949	1.63	6.09	6.94	0.41	2.56	0.06	0.16	0.02	0.50	2.03	3.23	4.49	28.12
1950	13.79	4.61	7.71	1.93	1.30	1.03	0.05	0.07	0.35	13.04	3.43	5.99	53.30
1951	8.47	7.56	3.94	2.05	1.38	T	0.05	0.02	0.79	3.88	7.80	9.10	45.04
1952	10.67	6.22	3.78	1.34	1.77	1.98	T	0.01	0.73	0.62	2.13	11.87	41.12
1953	12.63	3.44	5.95	3.18	5.83	1.24	T	0.41	0.61	3.84	9.57	3.62	50.32
1954	11.78	3.29	3.76	2.78	0.16	2.57	0.04	1.24	0.87	1.47	5.09	9.65	42.70
1955	5.73	1.83	1.82	5.56	0.03	0.11	0.21	T	1.18	2.64	5.77	11.63	36.51
1956	11.51	7.47	2.36	0.31	1.58	1.71	0.06	T	0.33	5.47	0.49	7.18	38.47
1957	4.22	4.36	8.77	1.96	3.42	0.30	0.34	0.02	1.37	6.00	4.44	5.69	40.89
1958	8.57	10.80	6.09	3.67	1.26	0.71	0.05	T	0.78	1.17	3.71	4.06	40.87
1959	7.23	10.65	3.37	0.52	0.91	0.25	T	0.01	1.54	0.74	0.28	3.64	29.14
1960	3.87	7.48	8.13	2.92	6.05	T	0.02	0.04	0.01	1.31	9.87	5.08	44.78
1961	4.54	7.53	7.90	3.49	3.97	0.50	0.03	0.30	0.53	2.28	5.65	3.44	40.16

1962	3.26	6.08	4.04	2.62	0.60	0.11	T	1.92	0.71	6.49	6.77	2.58	35.18
1963	1.70	4.74	6.28	10.68	1.74	0.33	0.11	0.07	0.68	5.41	6.91	3.20	41.85
1964	11.13	1.20	5.91	0.67	1.59	0.72	0.83	0.03	0.07	1.82	12.11	10.96	47.04
1965	5.82	1.36	1.23	5.60	0.44	0.35	T	0.36	T	0.70	5.20	5.22	26.28
1966	9.44	3.12	6.57	1.34	0.06	0.30	0.25	0.50	1.33	1.02	9.86	6.52	40.31
1967	8.87	1.47	7.44	5.29	1.52	0.32	0.00	T	1.32	2.15	4.40	4.34	37.12
1968	7.59	2.93	3.85	0.40	1.04	0.20	0.04	1.98	0.60	2.81	5.88	8.32	35.64
1969	13.92	7.82	1.56	3.22	1.01	0.34	0.05	T	0.36	3.20	3.49	9.60	44.57
1970	12.46	3.15	2.70	1.54	1.38	0.29	T	T	0.32	2.11	13.20	10.24	47.39
1971	5.41	3.28	7.91	2.92	1.28	1.51	0.16	0.55	2.08	0.92	6.36	6.38	38.76
1972	7.96	5.93	5.08	2.27	1.11	0.88	0.01	0.07	1.06	1.97	5.41	7.42	39.17
1973	6.47	3.85	7.10	0.35	0.85	0.23	T	0.08	2.35	4.14	16.58	7.02	49.02
1974	6.02	5.98	6.98	3.15	0.42	0.33	0.11	0.32	T	1.76	2.75	6.40	34.22
1975	5.20	7.68	10.73	3.29	1.05	0.58	0.10	0.58	0.01	6.77	4.72	5.38	46.09
1976	1.88	7.51	3.12	2.80	0.54	0.14	0.20	1.70	0.04	0.28	2.98	0.52	21.71
1977	1.90	2.24	4.33	1.20	2.10	0.07	T	0.20	3.35	2.79	4.51	6.60	29.29
1978	4.52	6.06	2.88	4.10	0.82	0.34	0.03	0.59	2.72	0.04	2.39	1.16	25.65
1979	3.82	6.26	1.70	3.94	2.25	0.05	0.31	0.13	1.15	6.14	6.19	3.75	35.69
1980	3.19	4.67	6.14	4.18	1.70	0.42	T	0.07	0.14	1.38	2.49	6.10	30.48
1981	7.67	3.72	4.64	0.71	2.02	0.57	T	0.01	0.97	3.71	9.39	9.88	43.29
1982	4.75	5.76	7.06	5.97	0.07	0.78	0.08	0.03	0.62	4.89	7.83	10.30	48.14
1983	8.48	9.18	10.73	5.47	1.12	0.65	0.89	3.42	0.87	1.87	10.40	14.13	67.21
1984	0.76	5.18	4.70	2.76	2.51	1.07	0.03	0.05	0.55	3.67	15.15	4.27	40.70
1985	0.66	3.69	4.68	0.45	1.14	0.89	0.15	0.52	1.06	4.07	2.98	2.78	23.07
1986	7.19	10.08	6.12	1.46	2.34	0.21	0.02	T	2.70	1.75	1.85	3.83	37.55
1987	6.48	3.38	6.10	1.15	0.41	0.26	0.20	0.06	0.02	1.05	4.23	10.92	34.26
1988	7.13	0.54	1.18	2.06	2.70	2.22	0.05	T	0.12	0.41	8.93	6.26	31.60
1989	4.71	2.88	7.63	2.01	1.67	0.21	0.08	0.13	0.85	2.90	1.60	0.80	25.47
1990	7.20	4.50	3.30	1.41	3.74	0.32	0.22	0.71	0.19	1.73	3.07	2.91	29.30
1991	1.65	2.75	6.94	2.52	2.16	0.26	1.13	0.37	T	1.06	1.95	2.36	23.15
1992	3.99	3.80	3.51	2.42	0.06	1.27	0.25	0.01	0.33	2.08	2.21	9.33	29.26
1993	7.15	5.93	4.72	5.94	4.44	1.23	0.37	0.54	0.03	0.56	1.35	7.12	39.38
1994	5.09	7.12	2.06	3.30	1.10	0.71	0.08	T	0.06	0.54	8.21	7.00	35.27
1995	12.74	1.40	11.18	7.47	1.21	1.85	0.08	0.22	0.69	0.53	2.26	11.56	51.19

1996	10.74	8.11	3.51	4.64	2.40	0.05	0.03	T	1.21	3.50	5.16	21.26	60.61
1997	8.81	2.55	2.73	3.06	0.90	1.25	T	0.84	2.05	2.73	7.39	4.73	37.04
1998	13.42	13.95	7.83	2.23	3.12	0.33	0.16	0.01	0.08	3.06	14.09	5.40	63.68
1999	4.37	10.32	8.94	1.79	1.62	0.15	0.04	0.30	0.05	1.60	7.36	3.02	39.56
2000	9.71	7.00	2.81	2.15	1.86	0.54	0.04	T	0.55	2.99	3.51	1.97	33.13
2001	3.79	3.60	2.45	2.54	0.71	0.69	0.20	0.21	0.28	1.00	7.71	11.56	34.74
2002	6.37	5.76	4.32	2.42	0.55	0.28	0.03	0.01	0.06	0.06	2.66	23.31	45.83
2003	5.51	3.84	4.91	11.25	1.74	0.04	0.02	0.49	0.35	0.55	5.78	11.35	45.83
2004	6.29	8.12	2.38	1.68	1.37	0.06	0.06	0.43	0.68	5.71	1.87	9.43	38.08
2005	5.91	2.41	6.24	4.70	3.90	3.08	0.05	0.07	0.08	2.40	8.52	12.72	50.08
2006	12.09	6.34	11.11	4.08	1.03	0.35	0.04	T	0.09	0.58	7.41	7.09	50.21
2007	1.86	11.86	2.51	2.72	0.86	0.46	0.97	0.08	0.60	4.92	2.33	7.30	36.47
2008	9.70	2.73	3.16	2.12	0.04	0.24	0.02	0.47	0.05	0.93	4.05	6.66	30.17
2009	1.58	6.20	5.45	1.23	2.93	0.18	0.06	0.02	1.03	1.95	4.15	4.17	28.95
2010	9.29	4.20	6.06	7.76	3.51	2.31	0.04	0.15	1.39	4.26	4.69	10.08	53.74
2011	2.23	3.62	11.88	4.07	1.43	1.29	0.17	0.04	0.37	4.21	3.86	2.22	35.39
2012	7.76	2.63	12.02	4.76	0.77	2.00	0.67	0.07	0.04	2.72	6.36	10.97	50.77
2013	2.57	1.78	3.09	2.44	1.17	0.43	0.00	0.08	3.14	0.05	1.29	0.56	16.60
2014	1.35	6.09	6.25	1.37	0.58	0.35	0.02	0.02	3.09	4.74	3.89	9.75	37.50
2015	1.36	5.04	3.21	2.57	0.07	0.04	0.15	0.41	0.27	1.18	4.88	14.66	33.84
2016	12.06	2.98	8.11	2.84	0.76	0.02	0.54	0.04	0.01	10.92	6.98	7.87	53.13
2017	10.51	11.10	7.97	5.46	1.31	0.59	0.07	0.05	1.01	1.64	7.40	1.94	49.05
2018	7.86	2.87	8.50	5.02	0.79	0.70	0.03	0.05	0.19	0.85	4.94	4.95	36.75
2019	6.67	14.43	4.79	2.51	2.61	0.00	0.00	0.18	1.92	1.51	1.75	7.63	44.00
2020	7.50	0.60	3.69	2.05	4.73	0.20	0.03	0.08	0.74	0.41	2.55	3.96	26.54
2021	7.10	4.32	3.93	0.71	M0.23								16.29

Notes: Data missing in any month have an "M" flag. A "T" indicates a trace of precipitation.

Data missing for all days in a month or year is blank.

Creation date: 2016-07-22

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G:\561\11220813\Tech\Environmental\Wetland Delineation

Appendix B

Appendix C

CNDDB, CNPS, IPaC, and NMFS Database Search Results

Technical Memorandum

June 21, 2022

To	Brett Vivyan, Project Manager	**Tel**	707-267-2207
Copy to	Misha Schwarz	**Email**	Kerry.McNamee@ghd.com
From	Rose E. Dana, Botanist; updated by Kerry McNamee, Environmental Planner	**Ref. No.**	11220813
Subject	Eureka SLR Botanical Surveys		

1. Introduction

1.1. Summary

This Technical Memorandum reports the results of botanical studies for the City of Eureka Flood Reduction and Sea Level Rise Mitigation Project (Project), being implemented by the City of Eureka (City). Botanical studies consisted of seasonally appropriate floristic surveys for special status plants and habitat assessments. Seasonally appropriate floristic surveys were conducted within the Project Study Boundary (PSB) on May 12th and July 26th, 2021, and following the addition of 1.9 acres into the PSB, on May 18th, 2022. One special status plant species was detected within the PSB, Point Reyes bird's-beak (*Chloropyron maritimum* ssp. *palustre*). The PSB is primarily located in the Palco Marsh with commercially or residentially developed areas and a community trail either adjacent to or also within the Project Survey Area. Mudflat, saltmarsh, open tidal waters, and urban scrub plant communities were observed. An eelgrass (*Zostera marina*) survey was conducted, and none was found in the PSB. A delineation of wetlands and/or other waters of the U.S./state was conducted on May 11th with a follow up site visit conducted to delineate an additional area on July 26th based on the presence of hydrophytic plants and hydrology, and on May 18th, 2022 following the additions to the PSB. Please see the accompanying Aquatic Resource Delineation Memo (GHD 2022) for results.

1.2. Project Description and Location

The Project is located in Eureka, Humboldt County, California (see Appendix A, Figure 1). Various Project components occur throughout the city, however those components are solely within the roadway and do not contain botanical resources and were therefore not considered within the PSB and were not surveyed. The PSB is bound to the east by Felt Street, to the north by Del Norte Street, to the west by Humboldt Bay and to the south along the Waterfront Trail adjacent to the Palco Marsh. A segmented portion of the PSB is located within a tidal inlet located immediately north of the intersection of Washington and Koster Streets to the north. The Project's staging area is proposed just north of the Del Norte Street Pier. Botanical surveys took place within the PSB, see Figure 2 within Appendix A for a map of the PSB.

2. Regulatory Setting

2.1. Federally Listed Species

Special status plant species under Federal jurisdiction include those listed as Endangered, Threatened, or as Candidate species by the United States Fish and Wildlife Service (USFWS) under the U.S. Endangered Species Act (ESA).

2.2. State Listed Species

Special status plant species under California Department of Fish and Wildlife (CDFW) jurisdiction include the following:

- Endangered, Threatened, or Candidate plant species listed under the California Endangered Species Act (CESA);
- plants listed as Rare under California Native Plant Protection Act (Fish & G. Code, § 1900 et seq.), and;
- California Rare Plant Ranking (CRPR) rare plants on the California Native Plant Society's (CNPS) Lists 1 and 2.

Plant species on CNPS Lists 1 and 2 are considered eligible for state listing as Endangered or Threatened pursuant to the California Fish and Game Code, and CDFW has oversight of these special status plant species as a trustee agency. Such species are considered during the CEQA process because they meet the definition of Threatened or Endangered under Sections 2062 and 2067 of the California Fish and Game Code. Plants on CNPS Lists 3 and 4 do not have formal protection under CEQA but may merit consideration in certain circumstances. CDFW publishes and periodically updates lists of special status species which include all taxa of concern that are tracked by CDFW. Additionally, locally significant plants (CEQA Guidelines, § 15125, subd. (c)), or as designated in local or regional plans, policies, or ordinances) are considered special status plant species (CDFW 2018).

2.3. Sensitive Natural Communities (CEQA)

Natural vegetation communities listed as Sensitive in the California Natural Diversity Database (CNDDB) and on the California Sensitive Natural Communities List are to be addressed within the CEQA review process (CDFW 2021b). Sensitive Natural Communities are primarily classified at the Alliance level according to A Manual of California Vegetation (Sawyer et al. 2009). Legacy Sensitive Natural Communities are listed in CNDDB according to the Holland classification system (1986), and Holland types may be used when a current Alliance-level classification does not exist (CDFW 2021b). CDFW considers alliances with a NatureServe State Rank of S1 to S3 to be Sensitive Natural Communities, and therefore these alliances are considered during the CEQA process (CDFW 2021b).

2.4. Environmentally Sensitive Habitat Areas

Environmentally Sensitive Habitat Areas (ESHAs) are defined by the Coastal Commission as follows:

> *"Environmentally sensitive area" means any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments.* (Pub. Resources Code, § 30107.5)

The Coastal Commission's designation of ESHA generally includes vegetation alliances listed in CDFW's California Sensitive Natural Communities List with an S1- S3 ranking. The Coastal Commission's ESHA category is broadly defined, and it also includes habitat for special status species, wetlands, riparian areas, and other areas that provide important ecosystem functions. While there is not a specific list of habitats considered to be ESHA for the State or County, the Coastal Commission through the Coastal Act and counties or municipalities through the Local Coastal Program (LCP) are the jurisdictional agencies that exert authority in identifying and protecting ESHA in the course of project activities.

3. Methods

3.1. Pre-Survey Investigations

A scoping list of CRPR plant species and habitats with recorded occurrences in the Project vicinity was compiled by consulting the CNDDB (CDFW 2021c), the CNPS *Inventory of Rare and Endangered Vascular Plants* (CNPS 2021), and the list of Federally protected plant species maintained by the USFWS (USFWS 2021). The scoping list, which can be found in Appendix B, includes special status plants that occur in habitats similar to the PSB with documented occurrences on the Eureka USGS quadrangle or adjacent quadrangles (9-quad area). The query yielded 33 special status plant species with CRPR list ranking of 1 or 2. All species were reviewed prior to the field surveys. Of the species identified during scoping, twelve have a high probability of occurring within the PSB based on available habitat and previous observations (GHD 2021). The Project is primarily roadside in a commercially and residentially developed area. The PSB also includes some anthropogenically modified wetlands, roadcuts, mud flats, salt marsh, and marginal scrub habitat that have some potential to support special status plants. The NRCS Web Soil Survey and National Wetland Inventory were also consulted to scope for soil conditions and likely wetland locations (Appendix A, Figures 4 and 5).

3.2. Floristic Surveys

GHD botanist Rose Dana conducted seasonally appropriate floristic surveys for special status plants on May 12th and July 26th, 2021, and GHD botanist Jane Cipra conducted the May 18th, 2022 survey for special status plants. The special status plant surveys followed *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFW 2018) and *General Rare Plant Survey Guidelines by the Endangered Species Recovery Program* (USFWS 2002). The special status plant surveys were conducted by walking the PSB and identifying all plant species encountered to the lowest taxonomic level necessary for rare plant identification. Because the Project includes mudflats that were challenging to navigate, binoculars were additionally used to examine mudflats in the PSB from the bank. Species nomenclature follows *The Jepson Manual* (Baldwin et al 2012). GHD Botanist Rose Dana has a degree in Plant Ecology from Humboldt State University, is working on her M.S. in Natural Resource Management, and has over 10 years' experience conducting biological and botanical surveys. Jane Cipra has a master's degree in biology with an emphasis in plant ecology and has over 20 years experience conducting biological and botanical surveys. The weather was partly sunny and approximately 60 degrees Fahrenheit during the spring survey (May 12th). Conditions were overcast and approximately 60 degrees Fahrenheit during the summer survey (July 26th). The weather was partly sunny and approximately 65 degrees Fahrenheit during the spring 2022 survey (May 18th). A list of species observed within the PSB is provided (Appendix C). The total survey effort was approximately 20 person-hours.

4. Results

4.1. Special Status Plants

One special status plant species, Point Reyes bird's-beak (*Chloropyron maritimum* ssp. *palustre*), was observed during the July 26th survey. No special status plants were observed in the initial May 12th survey. The May survey was appropriately timed to observe potentially occurring early-blooming special status plants such as Howell's montia (*Montia howellii*), which has been documented in similar roadside habitats, however was not observed during the survey. The July 26th survey was appropriately timed to observe the many later-blooming special status plants that have the potential to occur in the area, including western sand-spurrey (*Spergularia canadensis* var. *occidentalis*). Point Reyes bird's-beak was discovered on July 26th in a small relatively confined population of approximately 100 plants and was just beginning to bloom, see Figure 3 in Appendix A for the location of the observed population. Point Reyes bird's-beak has also been seen emerging during July in other similar habitats. The May 18th, 2022, survey was appropriately timed to observe early blooming species, however no special status plants were observed in the additional PSB area, rather the area was dominated by invasive species described in the section below. Surveys were appropriately timed for the blooming period, which appeared to have shifted slightly earlier in 2021, likely due to the dry and warm conditions.

4.2. Vegetation and Habitat Assessment

The PSB primarily consists of mud flat and salt marsh, which contains wet areas that are potential habitat for many special status plants. The PSB also primarily consists of urban scrub, and a small portion of the PSB intersects with a willow-forest edge (however no trees would be removed or modified in this area). Dense-flowered cordgrass (*Spartina densiflora*) and pickleweed (*Salicornia pacifica*) dominated the salt marsh. The center of the PSB was dominated with sweet fennel (*Foeniculum vulgare*), sweet vernal grass (*Athoxanthum odoratum*), and ripgut brome (*Bromus diandrus*). There was a small section that was dominated by arroyo willow (*Salix lasiolepis*), and common spike rush (*Eleocharis macrostachya*). The northern most area surveyed predominantly contained common reed (*Phragmites australis*) and fat-hen (*Atriplex* prostrata) along the channel, Himalayan blackberry (*Rubus armeniacus*) and sweet fennel on the upland. According to the CNDDB, the Palco Marsh is considered a Northern Coastal Salt Marsh with a State rarity rank of S3 (CDFW 2021a) and is therefore considered a Sensitive Natural Community. The Palco Marsh contains an abundance of invasive dense-flowered cordgrass as well as native species such as pickleweed.

5. Conclusion

The purpose of this evaluation was to conduct seasonally appropriate surveys for Federal, State and other sensitive listed plant species within the PSB that may potentially be affected by the Project. The floristic survey that occurred on July 26th was conducted during a negative ocean tide of -1.1 feet, which was appropriate for surveying eelgrass, and none was observed rooted in the PSB. One special status plant species was observed within the PSB (see Figure 3), and no additional rare plant surveys are needed within the PSB at this time.

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Appendices

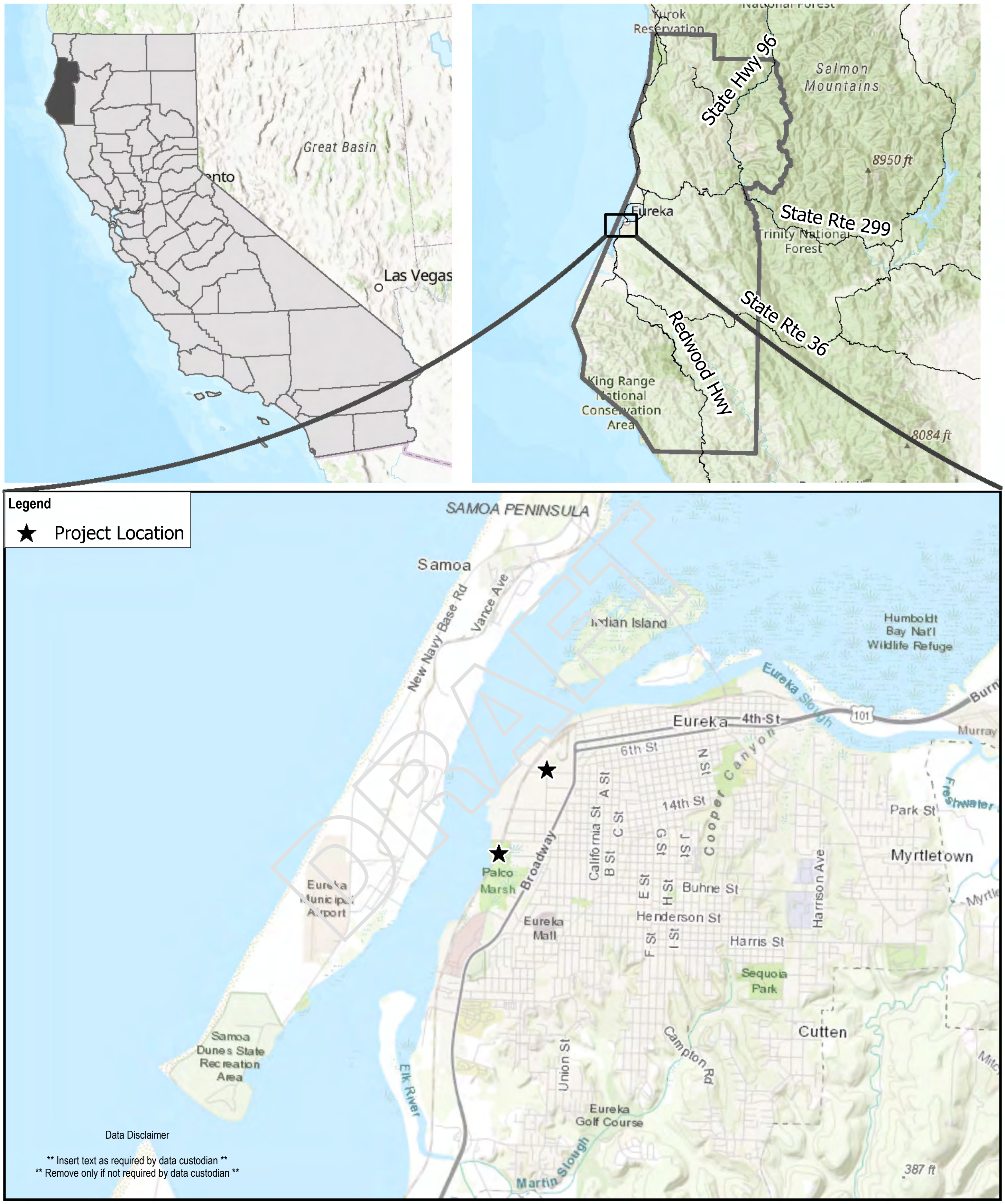
A. **Map Figures**

B. **Scoping Table**

C. **Plant Species Observed**

D. **Photo Index**

Appendix A. Map Figures



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Miles

Map Projection: Lambert Conformal Conic
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Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

N

GHD

City of Eureka
Flood Reduction and
Sea Level Rise Mitigation Project

Project No. **11220813**
Revision No. **-**
Date **June 2022**

Regional Map

FIGURE 1

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Paper Size ANSI A

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Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

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City of Eureka
Flood Reduction and
Seal Level Rise Mitigation Project

Project Area

Project No. **11220813**
Revision No. **-**
Date **June 2022**

FIGURE 2

N:\US\Eureka\Projects\561\11220813\GIS\Maps\Deliverables\Aquatic_Resources_Delineation\11220813_Aquatic_Resources_Delineation_RevB.aprx
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Paper Size ANSI A

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Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

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City of Eureka
Flood Reduction and
Seal Level Rise Mitigation Project

Botanical Survey

Project No. **11220813**
Revision No. **-**
Date **June 2022**

FIGURE 3

N:\US\Eureka\Projects\561\11220813\GIS\Maps\Deliverables\Aquatic_Resources_Delineation\11220813_Aquatic_Resources_Delineation_RevB.aprx - 11220813_003_SLR_BotanicalMemo
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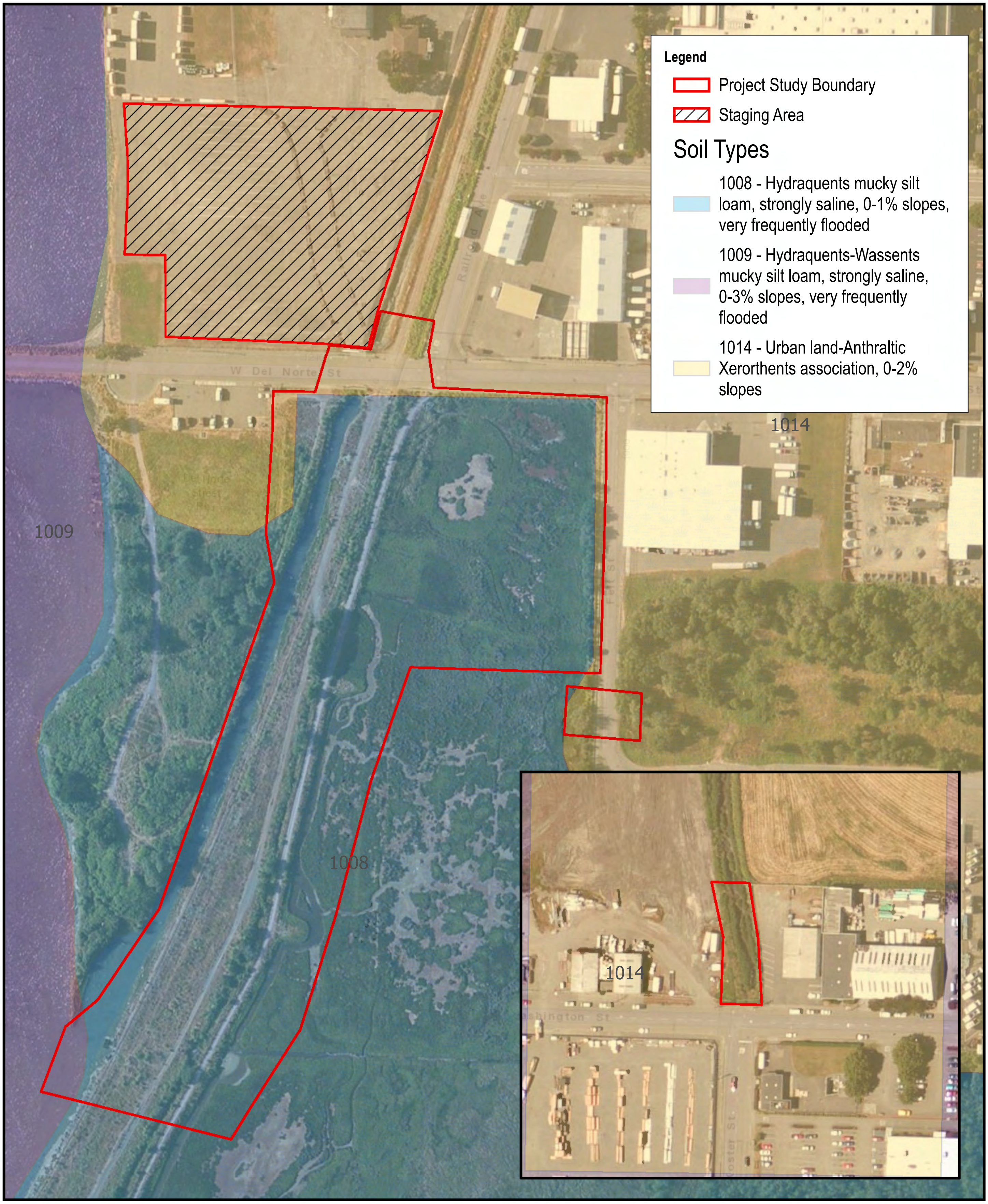

Paper Size ANSI A

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Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

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City of Eureka
Flood Reduction and
Seal Level Rise Mitigation Project

NRCS Soils

Project No. **11220813**
Revision No. **-**
Date **Jun 2022**

FIGURE 4

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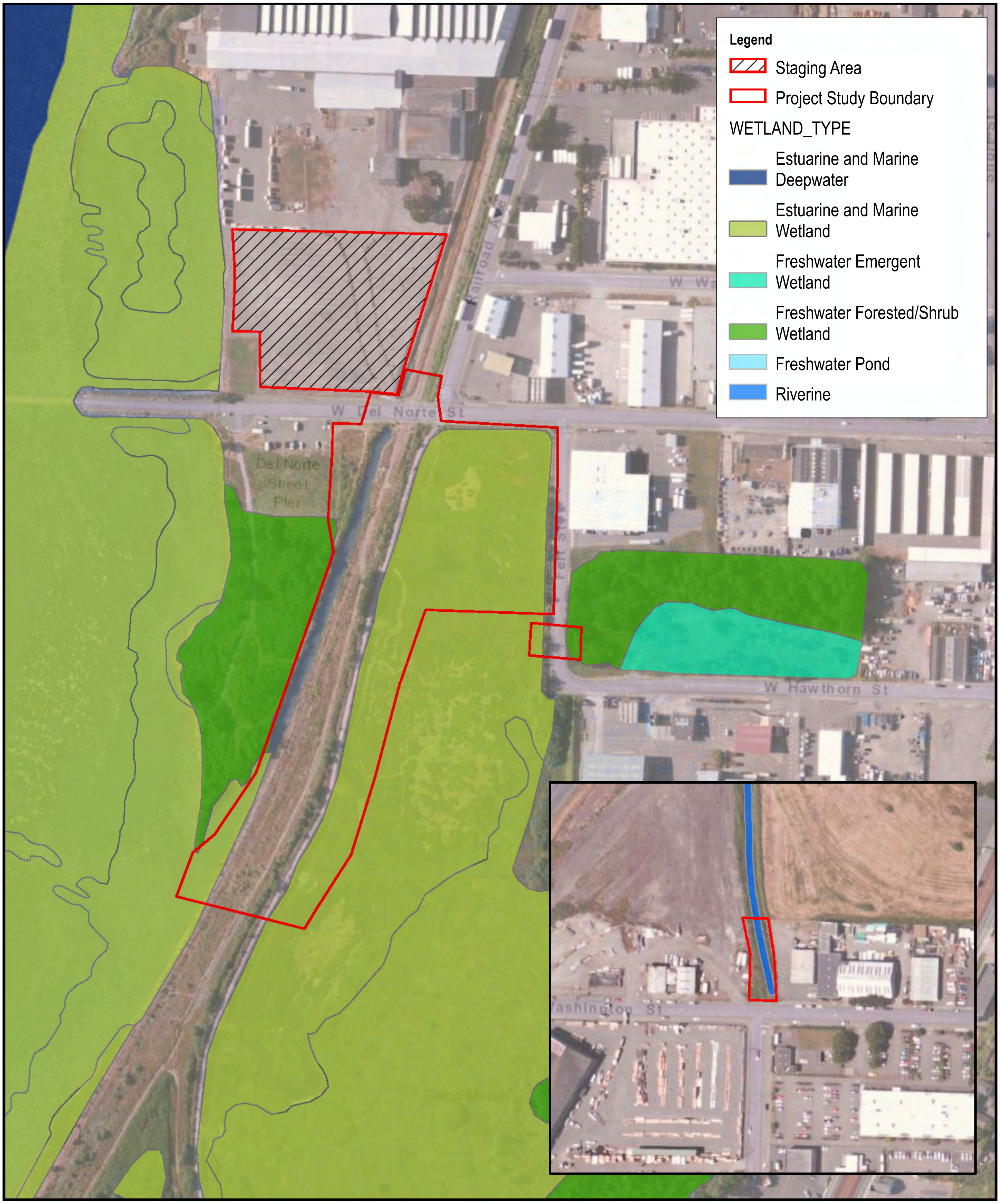

Paper Size ANSI A

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Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

N

GHD

City of Eureka
Flood Reduction and
Seal Level Rise Mitigation Project

Project No. **11220813**
Revision No. **-**
Date **Jun 2022**

National Wetland Inventory

FIGURE 5

N:\US\Eureka\Projects\561\11220813\GIS\Maps\Deliverables\Aquatic_Resources_Delineation\11220813_Aquatic_Resources_Delineation_RevB.aprx - 11220813_005_Aquatic_Resource_Delineation_NWI
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Data source: World Imagery (Clarity): Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community; World Street Map: Bureau of Land Management, Esri, HERE, Garmin, NGA, USGS. USFWS and National Wetlands Inventory. Created by: djones3

Appendix B. Potentially Occurring Special Status Plants

Scientific Name	Common Name	Family	CRPR	GRank	SRank	CESA	FESA	Blooming Period	Habitat	Potential
Abronia umbellata var. breviflora	pink sand-verbena	Nyctaginaceae	1B.1	G4G5T2	S2	None	None	Jun-Oct	Coastal dunes	Potential
Astragalus pycnostachyus var. pycnostachyus	coastal marsh milk-vetch	Fabaceae	1B.2	G2T2	S2	None	None	(Apr)Jun-Oct	Coastal dunes (mesic), Coastal scrub, Marshes and swamps (coastal salt, streamsides)	Potential
Bryoria spiralifera	twisted horsehair lichen	Parmeliaceae	1B.1	G3	S1S2	None	None		North Coast coniferous forest (immediate coast)	Potential
Cardamine angulata	seaside bittercress	Brassicaceae	2B.2	G4G5	S3	None	None	(Jan)Mar-Jul	Lower montane coniferous forest, North Coast coniferous forest	Potential
Carex arcta	northern clustered sedge	Cyperaceae	2B.2	G5	S1	None	None	Jun-Sep	Bogs and fens, North Coast coniferous forest (mesic)	Potential
Carex leptalea	bristle-stalked sedge	Cyperaceae	2B.2	G5	S1	None	None	Mar-Jul	Bogs and fens, Meadows and seeps (mesic), Marshes and swamps	Potential
Carex lyngbyei	Lyngbye's sedge	Cyperaceae	2B.2	G5	S3	None	None	Apr-Aug	Marshes and swamps (brackish or freshwater)	Potential
Carex praticola	northern meadow sedge	Cyperaceae	2B.2	G5	S2	None	None	May-Jul	Meadows and seeps (mesic)	Potential

Castilleja ambigua var. humboldtiensis	Humboldt Bay owl's-clover	Orobanchaceae	1B.2	G4T2	S2	None	None	Apr-Aug	Marshes and swamps (coastal salt)	High Potential
Castilleja litoralis	Oregon coast paintbrush	Orobanchaceae	2B.2	G3	S3	None	None	Jun-Jul	Coastal bluff scrub, Coastal dunes, Coastal scrub	Potential
Chloropyron maritimum ssp. palustre	Point Reyes bird's-beak	Orobanchaceae	1B.2	G4?T2	S2	None	None	Jun-Oct	Marshes and swamps (coastal salt)	High Potential
Collinsia corymbosa	round-headed Chinese-houses	Plantaginaceae	1B.2	G1	S1	None	None	Apr-Jun	Coastal dunes	Potential
Erysimum menziesii	Menzies? wallflower	Brassicaceae	1B.1	G1	S1	CE	FE	Mar-Sep	Coastal dunes	Potential
Erythronium revolutum	coast fawn lily	Liliaceae	2B.2	G4G5	S3	None	None	Mar-Jul(Aug)	Bogs and fens, Broadleafed upland forest, North Coast coniferous forest	Potential
Fissidens pauperculus	minute pocket moss	Fissidentaceae	1B.2	G3?	S2	None	None		North Coast coniferous forest (damp coastal soil)	No Potential
Gilia capitata ssp. pacifica	Pacific gilia	Polemoniaceae	1B.2	G5T3	S2	None	None	Apr-Aug	Coastal bluff scrub, Chaparral (openings), Coastal prairie, Valley and foothill grassland	High Potential
Gilia millefoliata	dark-eyed gilia	Polemoniaceae	1B.2	G2	S2	None	None	Apr-Jul	Coastal dunes	Potential
Hesperevax sparsiflora var. brevifolia	short-leaved evax	Asteraceae	1B.2	G4T3	S2	None	None	Mar-Jun	Coastal bluff scrub (sandy), Coastal dunes, Coastal prairie	Potential

Lasthenia californica ssp. macrantha	perennial goldfields	Asteraceae	1B.2	G3T2	S2	None	None	Jan-Nov	Coastal bluff scrub, Coastal dunes, Coastal scrub	Potential
Lathyrus japonicus	seaside pea	Fabaceae	2B.1	G5	S2	None	None	May-Aug	Coastal dunes	Potential
Lathyrus palustris	marsh pea	Fabaceae	2B.2	G5	S2	None	None	Mar-Aug	Bogs and fens, Coastal prairie, Coastal scrub, Lower montane coniferous forest, Marshes and swamps, North Coast coniferous forest	Potential
Layia carnosa	beach layia	Asteraceae	1B.1	G2	S2	CE	FE	Mar-Jul	Coastal dunes, Coastal scrub (sandy)	Potential
Lilium occidentale	western lily	Liliaceae	1B.1	G1	S1	CE	FE	Jun-Jul	Bogs and fens, Coastal bluff scrub, Coastal prairie, Coastal scrub, Marshes and swamps (freshwater), North Coast coniferous forest (openings)	High Potential
Monotropa uniflora	ghost-pipe	Ericaceae	2B.2	G5	S2	None	None	Jun-Aug(Sep)	Broadleafed upland forest, North Coast coniferous forest	Potential
Montia howellii	Howell's montia	Montiaceae	2B.2	G3G4	S2	None	None	(Jan-Feb)Mar-May	Meadows and seeps, North Coast coniferous forest, Vernal pools	Potential
Oenothera wolfii	Wolf's evening-primrose	Onagraceae	1B.1	G2	S1	None	None	May-Oct	Coastal bluff scrub, Coastal dunes, Coastal prairie, Lower montane coniferous forest	Potential
Puccinellia pumila	dwarf alkali grass	Poaceae	2B.2	G4?	SH	None	None	Jul	Marshes and swamps (coastal salt)	Potential

Sidalcea malviflora ssp. patula	Siskiyou checkerbloom	Malvaceae	1B.2	G5T2	S2	None	None	(Apr)May-Aug	Coastal bluff scrub, Coastal prairie, North Coast coniferous forest	High Potential
Sidalcea oregana ssp. eximia	coast checkerbloom	Malvaceae	1B.2	G5T1	S1	None	None	Jun-Aug	Lower montane coniferous forest, Meadows and seeps, North Coast coniferous forest	Potential
Silene scouleri ssp. scouleri	Scouler's catchfly	Caryophyllaceae	2B.2	G5T4T5	S2S3	None	None	(Mar-May)Jun-Aug(Sep)	Coastal bluff scrub, Coastal prairie, Valley and foothill grassland	Potential
Spergularia canadensis var. occidentalis	western sand-spurrey	Caryophyllaceae	2B.1	G5T4	S1	None	None	Jun-Aug	Marshes and swamps (coastal salt)	High Potential
Trichodon cylindricus	cylindrical trichodon	Ditrichaceae	2B.2	G4	S2	None	None		Broadleafed upland forest, Meadows and seeps, Upper montane coniferous forest	Potential
Viola palustris	alpine marsh violet	Violaceae	2B.2	G5	S1S2	None	None	Mar-Aug	Bogs and fens (coastal), Coastal scrub (mesic)	Potential

Appendix C. Plant Species Observed Onsite

Scientific Name	Common Name	Status	Family	Date
Achillea millefolium	Yarrow	native	Asteraceae	5/12/2021
Agrostis stolonifera	Redtop	invasive non-native	Poaceae	5/12/2021
Aira caryophyllea	Silvery hairgrass	non-native	Poaceae	5/12/2021
Allium triquetrum	White flowered onion	non-native	Alliaceae	5/12/2021
Anthoxanthum odoratum	Sweet vernal grass	invasive non-native	Poaceae	5/12/2021
Artemisia douglasiana	California mugwort	native	Asteraceae	5/12/2021
Atriplex prostrata	Fat-hen	non-native	Chenopodiaceae	5/12/2021
Avena barbata	Slim oat	invasive non-native	Poaceae	5/12/2021
Avena fatua	Wildoats	invasive non-native	Poaceae	5/12/2021
Baccharis pilularis	Coyote brush	native	Asteraceae	5/12/2021
Bellardia trixago	Mediterranean lineseed	invasive non-native	Orobanchaceae	5/12/2021
Berberis aquifolium	Mountain grape	native	Berberidaceae	5/12/2021
Bolboschoenus maritimus	Alkali bulrush	native	Cyperaceae	5/12/2021
Briza maxima	Rattlesnake grass	invasive non-native	Poaceae	5/12/2021
Briza minor	Little rattlesnake grass	non-native	Poaceae	5/12/2021
Bromus diandrus	Ripgut brome	invasive non-native	Poaceae	5/12/2021
Bromus hordeaceus	Soft chess	invasive non-native	Poaceae	5/12/2021
Bromus sitchensis var. carinatus	California brome	native	Poaceae	5/12/2021
Buddleja davidii	Butterfly bush	invasive non-native	Scrophulariaceae	5/12/2021
Cakile maritima	Sea rocket	invasive non-native	Brassicaceae	5/12/2021
Calamagrostis nutkaensis	Reedgrass	native	Poaceae	5/12/2021
Calystegia sepium	Hedge bindweed	native	Convolvulaceae	5/12/2021
Cardamine hirsuta	Hairy bitter cress	non-native	Brassicaceae	5/12/2021
Cerastium glomeratum	Large mouse ears	non-native	Caryophyllaceae	5/12/2021
Chloropyron maritimum ssp. palustre	Point reyes bird's-beak	rare, native	Orobanchaceae	7/26/2021
Conium maculatum	Poison hemlock	invasive non-native	Apiaceae	5/12/2021
Cornus sericea	American dogwood	native	Cornaceae	5/12/2021
Cortaderia jubata	Andean pampas grass	invasive non-native	Poaceae	5/12/2021
Cotoneaster lacteus	Milkflower cotoneaster	invasive non-native	Rosaceae	5/12/2021
Cotula coronopifolia	Brass buttons	invasive non-native	Asteraceae	5/12/2021
Cuscuta salina	Saltmarsh dodder	native	Convolvulaceae	5/12/2021
Cynosurus echinatus	Dogtail grass	invasive non-native	Poaceae	5/12/2021
Cyperus eragrostis	Tall cyperus	native	Cyperaceae	5/12/2021
Dactylis glomerata	Orchardgrass	invasive non-native	Poaceae	5/12/2021
Daucus carota	Carrot	non-native	Apiaceae	5/12/2021
Dipsacus fullonum	Wild teasel	invasive non-native	Dipsacaceae	5/12/2021
Distichlis spicata	Salt grass	native	Poaceae	5/12/2021
Eleocharis macrostachya	Spike rush	native	Cyperaceae	5/12/2021
Elymus glaucus	Blue wildrye	native	Poaceae	5/12/2021
Epilobium ciliatum	Slender willow herb	native	Onagraceae	5/12/2021

Equisetum arvense	Common horsetail	native	Equisetaceae	5/12/2021
Equisetum telmateia	Giant horsetail	native	Equisetaceae	5/12/2021
Erodium cicutarium	Coastal heron's bill	invasive non-native	Geraniaceae	5/12/2021
Eschscholzia californica	California poppy	native	Papaveraceae	5/12/2021
Festuca arundinacea	Reed fescue	invasive non-native	Poaceae	5/12/2021
Festuca myuros	Rattail sixweeks grass	invasive non-native	Poaceae	7/26/2021
Festuca perennis	Italian rye grass	invasive non-native	Poaceae	5/12/2021
Foeniculum vulgare	Fennel	invasive non-native	Apiaceae	5/12/2021
Galium aparine	Cleavers	native	Rubiaceae	5/12/2021
Galium trifidum	three petaled bedstraw	native	Rubiaceae	5/12/2021
Genista monspessulana	French broom	invasive non-native	Fabaceae	5/12/2021
Geranium dissectum	Wild geranium	invasive non-native	Geraniaceae	5/12/2021
Geranium molle	Crane's bill geranium	non-native	Geraniaceae	5/12/2021
Grindelia stricta var. stricta	Coastal gum plant	native	Asteraceae	5/12/2021
Hedera helix	English ivy	invasive non-native	Araliaceae	5/12/2021
Hirschfeldia incana	Mustard	invasive non-native	Brassicaceae	5/12/2021
Holcus lanatus	Common velvetgrass	invasive non-native	Poaceae	5/12/2021
Hordeum brachyantherum	Meadow barley	native	Poaceae	5/12/2021
Hordeum murinum	Foxtail barley	invasive non-native	Poaceae	5/12/2021
Hypericum perforatum	Klamathweed	invasive non-native	Ericaceae	5/12/2021
Hypochaeris radicata	Hairy cats ear	invasive non-native	Asteraceae	5/12/2021
Jaumea carnosa	Marsh jaumea	native	Asteraceae	5/12/2021
Juncus bufonius	Common toad rush	native	Juncaceae	5/12/2021
Juncus hesperius	Coast or bog rush	native	Juncaceae	5/12/2021
Juncus lescurii	Dune rush	native	Juncaceae	5/12/2021
Lepidium didymum	Lesser swine cress	non-native	Brassicaceae	5/12/2021
Limonium californicum	Marsh rosemary	native	Plumbaginaceae	5/12/2021
Linum bienne	Flax	non-native	Linaceae	5/12/2021
Lonicera involucrata	Coast twinberry	native	Caprifoliaceae	5/12/2021
Lotus corniculatus	Bird's foot trefoil	non-native	Fabaceae	5/12/2021
Lupinus arboreus x	Coastal bush lupine	native	Fabaceae	5/12/2021
Lupinus bicolor	Lupine	native	Fabaceae	5/12/2021
Lysimachia arvensis	Scarlet pimpernel	non-native	Myrsinaceae	5/12/2021
Malus pumila	Paradise apple	non-native	Rosaceae	5/12/2021
Malva neglecta	Dwarf mallow	non-native	Malvaceae	5/12/2021
Matricaria discoidea	Pineapple weed	native	Asteraceae	5/12/2021
Medicago polymorpha	California burclover	invasive non-native	Fabaceae	5/12/2021
Medicago sativa	Alfalfa	non-native	Fabaceae	5/12/2021
Morella californica	California wax myrtle	native	Myricaceae	5/12/2021
Oenanthe sarmentosa	Water parsley	native	Apiaceae	5/12/2021
Parapholis incurva	Sickle grass	non-native	Poaceae	5/12/2021
Parentucellia viscosa	Yellow parentucellia	invasive non-native	Orobanchaceae	5/12/2021
Philadelphus lewisii	Wild mock orange	native	Hydrangeaceae	5/12/2021
Phragmites australis	Common reed	native	Poaceae	7/26/2021
Physocarpus capitatus	Ninebark	native	Rosaceae	5/12/2021

Pinus contorta ssp. contorta	Shore pine	native	Pinaceae	5/12/2021
Plantago coronopus	Cut leaf plantain	non-native	Plantaginaceae	5/12/2021
Plantago lanceolata	Ribwort	invasive non-native	Plantaginaceae	5/12/2021
Poa annua	Annual blue grass	non-native	Poaceae	5/12/2021
Poa pratensis	Kentucky blue grass	invasive non-native	Poaceae	5/12/2021
Poa secunda	Pine bluegrass	native	Poaceae	5/12/2021
Polygonum aviculare	Prostrate knotweed	non-native	Polygonaceae	5/12/2021
Polypogon monspeliensis	Annual beard grass	invasive non-native	Poaceae	5/12/2021
Polystichum munitum	Western sword fern	native	Dryopteridaceae	5/12/2021
Potentilla anserina	Silver weed cinquefoil	native	Rosaceae	5/12/2021
Ranunculus repens	Crowfoot, creeping buttercup	invasive non-native	Ranunculaceae	5/12/2021
Raphanus raphanistrum	Jointed charlock	non-native	Brassicaceae	5/12/2021
Raphanus sativus	Jointed charlock	invasive non-native	Brassicaceae	5/12/2021
Rosa nutkana	Nootka rose	native	Rosaceae	5/12/2021
Rubus armeniacus	Himalayan blackberry	invasive non-native	Rosaceae	5/12/2021
Rubus ursinus	California blackberry	native	Rosaceae	5/12/2021
Rumex acetosella	Sheep sorrel	invasive non-native	Polygonaceae	5/12/2021
Rumex crispus	Curly dock	invasive non-native	Polygonaceae	5/12/2021
Salicornia pacifica	Pickleweed	native	Chenopodiaceae	5/12/2021
Salix hookeriana	Coastal willow	native	Salicaceae	5/12/2021
Salix lasiandra	Pacific willow	native	Salicaceae	5/12/2021
Salix lasiolepis	Arroyo willow	native	Salicaceae	5/12/2021
Scirpus microcarpus	Mountain bog bulrush	native	Cyperaceae	5/12/2021
Sonchus asper	Spiny sowthistle	non-native	Asteraceae	5/12/2021
Spartina densiflora	Dense flowered cord grass	invasive non-native	Poaceae	5/12/2021
Spergularia marina	Salt sand spurry	native	Caryophyllaceae	5/12/2021
Spergularia rubra	Purple sand spurry	non-native	Caryophyllaceae	7/26/2021
Spiraea douglasii	Douglas spiraea	native	Rosaceae	5/12/2021
Stachys rigida	Rough hedgenettle	native	Lamiaceae	5/12/2021
Stellaria media	Chickweed	non-native	Caryophyllaceae	5/12/2021
Symphyotrichum chilense	Pacific aster	native	Asteraceae	5/12/2021
Tragopogon porrifolius	Salsify	non-native	Asteraceae	5/12/2021
Trifolium campestre	Hop clover	non-native	Fabaceae	5/12/2021
Trifolium dubium	Shamrock	non-native	Fabaceae	5/12/2021
Trifolium hirtum	Rose clover	invasive non-native	Fabaceae	5/12/2021
Triglochin maritima	Seaside arrow grass	native	Juncaginaceae	5/12/2021
Triphysaria eriantha	Butter 'n' eggs	native	Orobanchaceae	5/12/2021
Typha latifolia	Broadleaf cattail	native	Typhaceae	5/12/2021
Vicia hirsuta	Hairy vetch	non-native	Fabaceae	5/12/2021
Vicia sativa	Spring vetch	non-native	Fabaceae	5/12/2021
Vicia tetrasperma	Four seeded vetch	non-native	Fabaceae	5/12/2021
Vicia villosa	Hairy vetch	non-native	Fabaceae	5/12/2021

Appendix D. Photo Index

Photo 1. Dense flowered chord grass and pickleweed dominating salt marsh channel on western Project Area edge.

Photo 2. Point reyes bird's beak (*Chloropyron maritimum ssp. Palustre*) within a small population inside the Project Area.

Photo 3. Urban scrub within the Project Area, photo taken May 12th, 2021.

Photo 4. Mud flats without rooted eelgrass within the Project Area.

Photo 5. Arroyo willow habitat on the eastern edge of the Project Area surrounding the Palco Marsh, photo taken May 12th 2021.

Photo 6. Sweet fennel dominated urban scrub plant community.

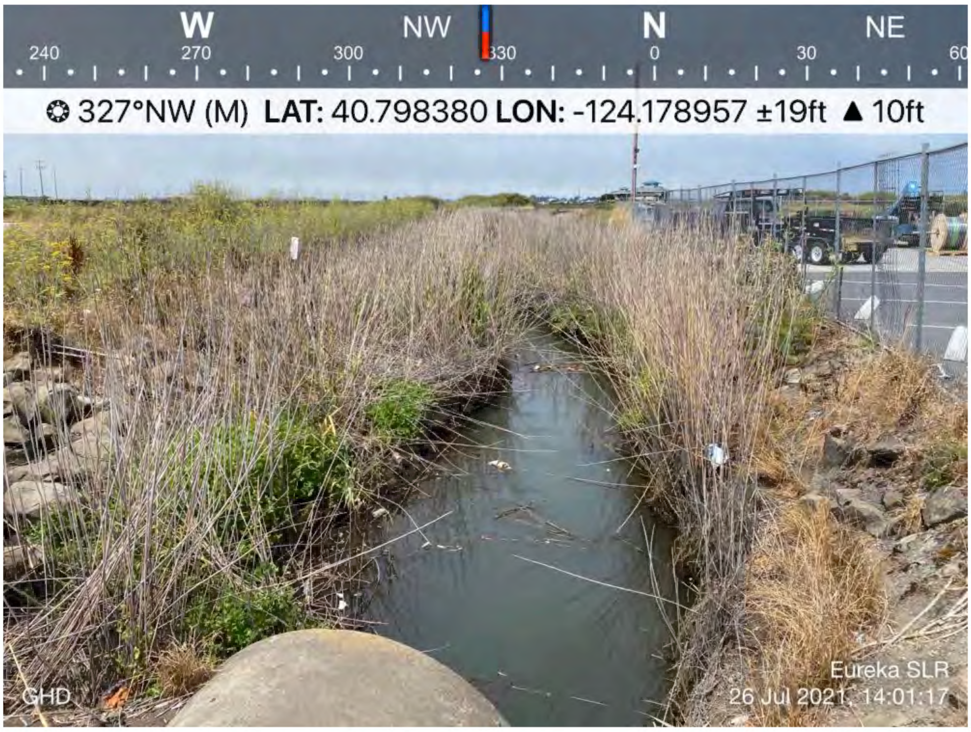

Photo 7. Common reed and fat-hen dominated channel.

Appendix H
Fisheries Monitoring and eDNA Analysis

<u>FINDINGS REPORT FOR PRE-PROJECT FISHERIES SAMPLING AT PALCO MARSH AND CLARK'S SLOUGH</u>

GHD, Inc. requested pre-project fisheries presence/absence sampling from Ross Taylor and Associates (RTA) and Cal-Poly Humboldt for two drainage improvement projects in Eureka within the PALCO Marsh and Clark's Slough (Figure 1). Cal-Poly Humboldt's Fisheries Department conducted eDNA sampling and testing for Tidewater Goby and several species of salmonids and RTA physically sampled these same areas with seine nets on April 27, 2022. This findings report describes the field and lab methods employed and the results.

Field Methods:
RTA and Cal Poly Humboldt staff met at the PALCO Marsh site on 4/27/22 at 10:00 AM to conduct the seine netting and collection of water samples for eDNA testing. This sampling occurred near the top of the high tide and flow from Humboldt Bay was still slowly moving into the PALCO Marsh channel. Approximately 800 feet of the PALCO Marsh channel was sampled and approximately 100 feet of Clark's Slough was sampled. At the PALCO Marsh site, the reach sampled extended from West Del Norte Street, south to a culvert where tidal exchange with Humboldt Bay occurred (Figure 2). At the PALCO Marsh site, the water samples for eDNA sampling were collected at four locations, spaced approximately 150 feet apart. The water samples were collected prior to the seine netting so that stirred-up bottom sediments didn't contaminate the water samples. At each water sampling location, 1.75-liter samples were collected by pulling a sterile Whirl-pak™ bag through the water near the surface. To detect potential contamination associated with field methods, one field blank was taken between sampling locations. Field blanks consisted of 250 ml of store-bought drinking water placed into a sterile Whirl-pak™ bag. Water samples were stored in a cooler to be processed in Cal-Poly Humboldt's water filtration lab. At each water sample location, RTA measured water temperature, dissolved oxygen and salinity. After the water samples were collected the entire PALCO Marsh reach was sampled with a 10-foot-long seine net with an 1/8-inch mesh, so that if present, Tidewater Goby would be captured by the small mesh. The seine netting pass was made against the current of the incoming tide and we periodically lifted the net to remove fish (Figure 3). All fish were temporarily held in a five-gallon pail with a battery powered aerator. Once the seine net sampling was completed the fish were identified to species, enumerated, and released.

At West Clark Street, the field methods were similar, with the eDNA water samples collected and water quality measured prior to seine netting. Three water samples were collected at Clark's Slough, one right at the culvert outlet and two more, taken approximately 50 feet and 100 feet downstream of the culvert outlet. Approximately 100 feet of channel was netted and three passes were made with a 20-foot-long seine net with an 1/8-inch mesh (Figure 4). All fish were temporarily held in a five-gallon pail with a battery powered aerator. Once the seine net sampling was completed the fish were identified to species, enumerated, and released.

<u>Laboratory eDNA Methods:</u>

All samples were filtered over a 47mm diameter 3.0µm cellulose nitrate filter in accordance with standard practices used in the Kinziger genetics lab (Sutter and Kinziger 2019). Each filter was placed on a sterilized filter funnel and water was pulled across the filter using a vacuum handpump. After a sample was filtered, the filter was placed in a 2.0 mL DNA LoBind microcentrifuge tube and stored at -20°C until extraction. All eDNA extractions were conducted in a dedicated low DNA copy number laboratory. Samples were extracted using filter dissolution in acetone and a QIAGEN DNeasy Blood and Tissue Kit following manufacturer's instructions. Concentration of genetic material collected in water samples and species presence was determined using a BioRad QX200 digital droplet PCR system (ddPCR) utilizing assays specific to Coho Salmon, Chinook Salmon, steelhead and Tidewater Goby. PCR set up was performed in a dedicated low DNA copy number laboratory. The assays still need to be tested for limit of detection and quantification before conclusion of species presence or absence can be validated.

<u>Field Results:</u>

The channel reach at PALCO Marsh was relatively uniform with a mud bottom, with minimal cover habitat for fish, and depths between 0.5 and 1.0 feet; except adjacent to the tidal exchange culvert where the maximum depth was 2.3 feet. The only species of fish caught at this location was Pacific staghorn sculpin and a total of 27 fish were caught. Most of the Pacific staghorn sculpin were age-0 fish and less than 20 mm in length; however, several fish were 30-40 mm in length (Figure 5). Five green shore crabs were also caught in the PALCO Marsh reach (Figure 6). Water quality measurements taken at the four locations where eDNA water samples were collected equaled:

- <u>Site #1:</u> at depth of 0.5 feet – dissolved oxygen = 10.38 mg/L; temperature = 13.5°C; salinity = 29.1 ppt.
- <u>Site #2:</u> at depth of 0.5 feet - dissolved oxygen = 10.41 mg/L; temperature = 13.2°C; salinity = 30.2 ppt.
- <u>Site #3:</u> at depth of 0.5 feet - dissolved oxygen = 9.79 mg/L; temperature = 12.8°C; salinity = 30.2 ppt.
- <u>Site #4:</u> at depth of 0.5 feet - dissolved oxygen = 9.94 mg/L; temperature = 12.4°C; salinity = 30.5 ppt.
- <u>Site #4:</u> at depth of 1.5 feet - dissolved oxygen = 9.96 mg/L; temperature = 12.3°C; salinity = 30.5 ppt.

The channel reach at Clark's Slough was relatively uniform with a firm mud bottom, overhanging riparian vegetation, and depths between 2.5 and 3.0 feet. Two species of fish were caught at this location; Pacific staghorn sculpin (44 fish caught) and three-spine stickleback (61 fish caught). Many of the Pacific staghorn sculpin were age-0 fish and less than 20 mm in length; however, several larger fish were caught; 50-80 mm in length. Water quality measurements taken near the culvert outlet, from the near surface to the bottom, in one-foot intervals:

- At 0.5 feet – dissolved oxygen = 7.27 mg/L; temperature = 13.3°C; salinity = 14.9 ppt.
- At 1.0 feet – dissolved oxygen = 6.82 mg/L; temperature = 13.1°C; salinity = 21.3 ppt.
- At 2.0 feet – dissolved oxygen = 6.19 mg/L; temperature = 13.4°C; salinity = 21.8 ppt.

- At 3.0 feet – dissolved oxygen = 5.93 mg/L; temperature = 13.4°C; salinity = 28.5 ppt.

eDNA Results:

Assuming a limit of detection of five copies per reaction, coho salmon, steelhead and chinook salmon were undetected in all seven water samples, the negative control and field blanks were negative, and the positive control tested positive for all species. The positive control for tidewater goby tested negative and thus the results are not reported here. A final report will be prepared by Cal Poly Humboldt that includes the limit of detection and limit of quantification for all four species. Also, the samples will be re-tested for tidewater goby. These preliminary results were submitted to GHD, Inc. under separate cover by Cal Poly Humboldt and the final report will submitted by Cal Poly Humboldt at a future date.

Literature Citation:

Sutter, Michael & Kinziger, Andrew. (2019). Rangewide tidewater goby occupancy survey using environmental DNA. Conservation Genetics. 20. 10.1007/s10592-019-01161-9.

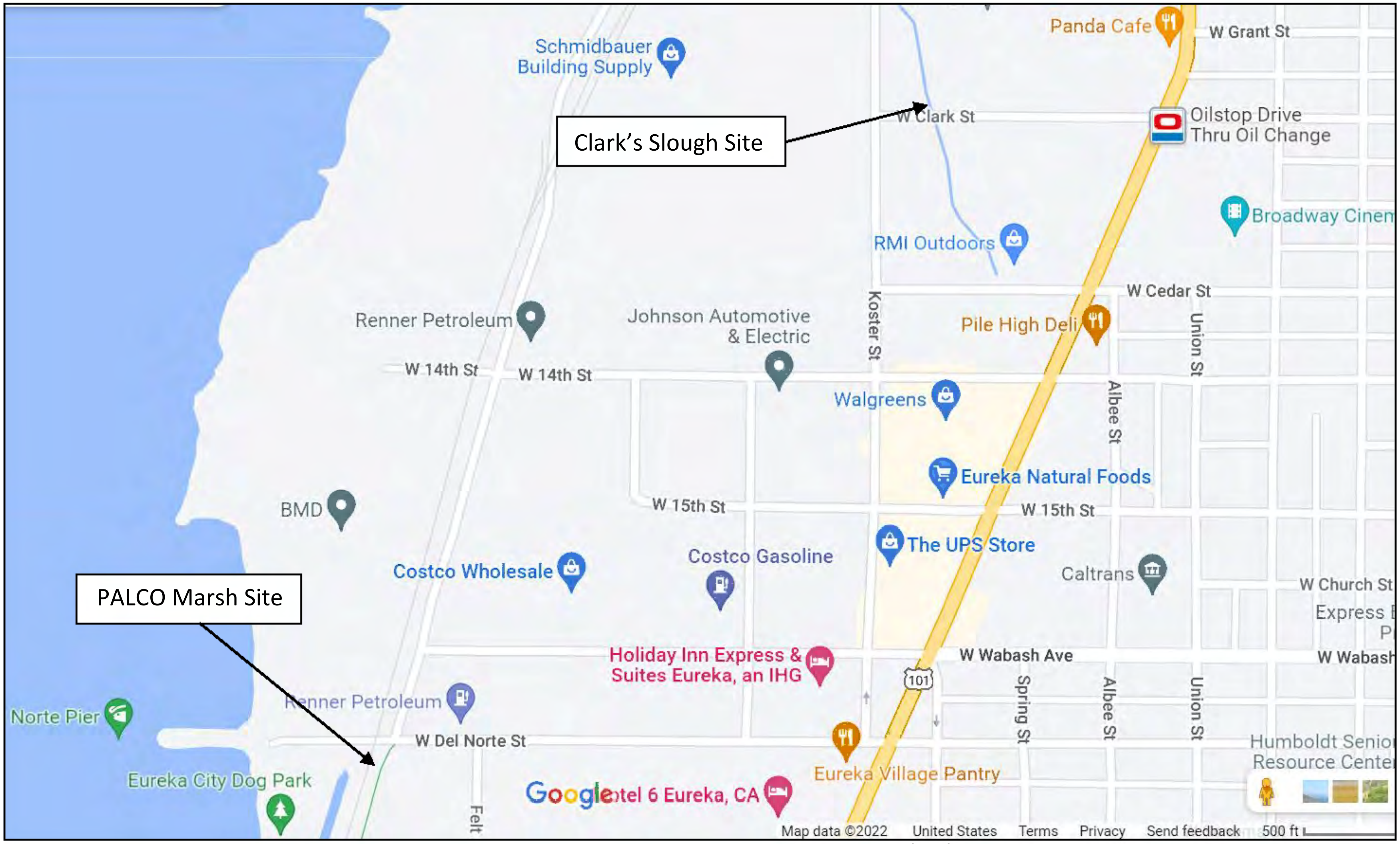

Figure 1. Location of PALCO Marsh and West Clark Street sites that were sampled on 4/27/22.

Figure 2. Lower end of PALCO Marsh sample site, near culvert exchange with Humboldt Bay.

Figure 3. Seine netting the PALCO Marsh sample site on 4/27/22.

Figure 4. Seine netting the Clark's Slough sample site on 4/27/22.

Figure 5. Pacific staghorn sculpins from the PALCO Marsh sample site on 4/27/22.

Figure 6. Green shore crab from the PALCO Marsh sample site on 4/27/22.

Summary
A total of seven water samples were collected in Palco Marsh and Clark Slough are tested for northern tidewater goby (*Eucyclogobius newberryi*), coho salmon (*Oncorhynchus kisutch*), steelhead (*Oncorhynchus mykiss)* and chinook salmon (*Oncorhynchus tshawytscha*) using assays specific to each species. Assuming a limit of detection of five copies per reaction, coho salmon, steelhead and chinook salmon were undetected in all seven water samples, the negative control and field blanks were negative, and the positive control tested positive for all species. The positive control for tidewater goby tested negative and thus the results are not reported here. A final report will be prepared that includes the limit of detection and limit of quantification for all four species. Also, the samples will be re-tested for tidewater goby.

Results:

tidewater goby (*Eucyclogobius newberryi*)

Sample Name	Location	Latitude	Longitude	Date	Droplet #	Positive Droplet	Copies/reaction	Assay reference
Palco 1	Palco Marsh	40.78918056	-124.18567222	4/27/22	18744			Schmelzle and Kinziger (2016)
Palco 2	Palco Marsh	40.78921667	-124.18572778	4/27/22	19016			Schmelzle and Kinziger (2016)
Palco 3	Palco Marsh	40.78841944	-124.18572778	4/27/22	17488			Schmelzle and Kinziger (2016)
Palco 4	Palco Marsh	40.78801111	-124.18610833	4/27/22	19576			Schmelzle and Kinziger (2016)
Clark 1	Clark Slough	40.79859722	-124.17895000	4/27/22	17959			Schmelzle and Kinziger (2016)
Clark 2	Clark Slough	40.79853611	-124.17894167	4/27/22	20086			Schmelzle and Kinziger (2016)

Clark 3	Clark Slough	40.79853611	-124.17894167	4/27/22	19435			Schmelzle and Kinziger (2016)
Field Blank				4/27/22	20335			Schmelzle and Kinziger (2016)
PCR Positive Control					16573			Schmelzle and Kinziger (2016)

coho salmon (*Oncorhynchus kisutch*)

Sample Name	Location	Latitude	Longitude	Date	Droplet #	Positive Droplet	Copies/reaction	Assay reference
Palco 1	Palco Marsh	40.78918056	-124.18567222	4/27/22	13355	0	0	Pilliod et al. (2016); Spence et al. (2021)
Palco 2	Palco Marsh	40.78921667	-124.18572778	4/27/22	14485	3	4.88	Pilliod et al. (2016); Spence et al. (2021)
Palco 3	Palco Marsh	40.78841944	-124.18572778	4/27/22	13093	0	0	Pilliod et al. (2016); Spence et al. (2021)
Palco 4	Palco Marsh	40.78801111	-124.18610833	4/27/22	8983	0	0	Pilliod et al. (2016); Spence et al. (2021)
Clark 1	Clark Slough	40.79859722	-124.17895000	4/27/22	9379	0	0	Pilliod et al. (2016); Spence et al. (2021)
Clark 2	Clark Slough	40.79853611	-124.17894167	4/27/22	18160	0	0	Pilliod et al. (2016); Spence et al. (2021)

Clark 3	Clark Slough	40.79853611	-124.17894167	4/27/22	17581	2	2.68	Pilliod et al. (2016); Spence et al. (2021)
Field Blank				4/27/22	15753	0	0	Pilliod et al. (2016); Spence et al. (2021)
PCR Positive Control					10816	16	34.8	Pilliod et al. (2016); Spence et al. (2021)

steelhead (*Oncorhynchus mykiss)*

Sample Name	Location	Latitude	Longitude	Date	Droplet #	Positive Droplet	Copies/reaction	Assay reference
Palco 1	Palco Marsh	40.78918056	-124.18567222	4/27/22	12327	1	1.908	Wilcox et al. (2015)
Palco 2	Palco Marsh	40.78921667	-124.18572778	4/27/22	17597	0	0	Wilcox et al. (2015)
Palco 3	Palco Marsh	40.78841944	-124.18572778	4/27/22	17504	0	0	Wilcox et al. (2015)
Palco 4	Palco Marsh	40.78801111	-124.18610833		18425	0	0	Wilcox et al. (2015)
Clark 1	Clark Slough	40.79859722	-124.17895000	4/27/22	18137	1	1.298	Wilcox et al. (2015)
Clark 2	Clark Slough	40.79853611	-124.17894167	4/27/22	18089	0	0	Wilcox et al. (2015)

Clark 3	Clark Slough	40.79853611	-124.17894167	4/27/22	19086	0	0	Wilcox et al. (2015)
Field Blank				4/27/22	10757	0	0	Wilcox et al. (2015)
PCR Positive Control					17300	511	706	Wilcox et al. (2015)

chinook salmon (*Oncorhynchus tshawytscha*)

Sample Name	Location	Latitude	Longitude	Date	Droplet #	Positive Droplet	Copies/reaction	Assay reference
Palco 1	Palco Marsh	40.78918056	-124.18567222	4/27/22	13874	0	0	Franklin, T. (US Forest Service), Unpublished.
Palco 2	Palco Marsh	40.78921667	-124.18572778	4/27/22	18510	0	0	Franklin, T. (US Forest Service), Unpublished.
Palco 3	Palco Marsh	40.78841944	-124.18572778	4/27/22	17783	1	1.324	Franklin, T. (US Forest Service), Unpublished.
Palco 4	Palco Marsh	40.78801111	-124.18610833	4/27/22	19082	3	3.7	Franklin, T. (US Forest Service), Unpublished.
Clark 1	Clark Slough	40.79859722	-124.17895000	4/27/22	19663	1	1.196	Franklin, T. (US Forest Service), Unpublished.
Clark 2	Clark Slough	40.79853611	-124.17894167	4/27/22	19843	1	1.186	Franklin, T. (US Forest Service), Unpublished.

Clark 3	Clark Slough	40.79853611	-124.17894167	4/27/22	19179	1	1.226	Franklin, T. (US Forest Service), Unpublished.
Field Blank				4/27/22	19089	2	2.46	Franklin, T. (US Forest Service), Unpublished.
PCR Positive Control					15529	5799	11000	Franklin, T. (US Forest Service), Unpublished.

Methods

Seven water samples were collected at Palco Marsh and Clark Slough in locations where water quality data was recorded. At Palco Marsh, 4 water samples were collected at roughly equal distances across the same reach seining was conducted. At Clark slough, 1 sample was collected directly in front of the culvert and 2 were collected ~20 meters downstream. Samples were collected prior to seining to avoid contamination from sampling equipment and suspension of sediment. At each water sampling location, 1.75 liter of water was collected by pulling a sterile 2 Liter Whirl-pak™ bag through the water near the surface. To detect potential contamination associated with field methods, 1 field blank was processed during the field trip. The field blank consisted of 250 ml of store-bought drinking water placed into a sterile Whirl-pak™ bag and processed like all other water samples to serve as a comprehensive control for contamination.. Water samples were stored in a cooler for less than two hours prior to filtration.

Samples were filtered at Cal Poly Humboldt in a dedicated water filtration laboratory. All 1.75 liters were filtered over a 47 mm diameter 3.0µm cellulose nitrate filter (Whatman A29621265) placed on a filter support pad (MilliporeSigma AP1004700) and inserted into a sterilized plastic filter funnel (Thermo Scientific 1452045). Water was pulled across the filter's membrane using a pneumatic hand pump (EWK EB0103A). Cellulose nitrate filters were placed in a 2.0 mL DNA LoBind microcentrifuge tube and stored at -20°C until extraction.

Environmental DNA was extracted directly from filters using acetone dissolution (Hurst e tal. 2014) and a standard Qiagen DNeasy Blood and Tissue kit according to manufacturer's instructions except samples were eluted into 100ul of buffer AE. Following extraction samples were stored at -20°C

The concentration of DNA of the target species was determined by droplet digital PCR (ddPCR) using a BioRad QX200 system. Each 22 uL ddPCR reaction included 900 nM of forward primer, 900 nM of reverse primer, 250 nM of probe specific for each species In addition to primer and probes, 5 uL BioRad ddPCR Multiplex Supermix for Probes (BioRad # 12005910), and 15 uL extracted DNA template was put into each reaction. A total of 20 µl of the reaction mixture and 70 µl of BioRad droplet oil were placed into each well of the BioRad DG8 cartridges and combined on the BioRad QX200 Droplet Generator to produce a 42 µl reaction mix partitioned into up to 20,000 nanoliter-sized droplets. The reaction mix was transferred to a PCR plate for amplification on a MJ Research PTC-100 Thermal Cycler using the following conditions: hold at 95°C for 10 min, 40 cycles of 94°C for 30 s, 60°C for 1 min, and a final step at 98°C for 10 min. The temperature ramp rate was set at 2 °C per second for all steps. Following cycling, the BioRad QX200 droplet reader was used to count PCR-positive and PCR-negative droplets. We included a negative control (containing all reagents except DNA template was replaced with DNA free water) and one positive control (extracted genomic DNA) for each target species. Results are reported as the Poisson corrected number of copies per 20 µl reaction.

Citation

Hurst, Charlene N., Peter Wong, Sascha L. Hallett, R. Adam Ray, and Jerri L. Bartholomew (2014). Transmission and persistence of *Ceratonova shasta* genotypes in Chinook salmon. The Journal of Parasitology 100: 773–777.

Pilliod, D. S., & Laramie, M. B. (2016). Salmon redd identification using environmental DNA (eDNA) (No. 2016-1091). US Geological Survey.

Spence, B. C., Rundio, D. E., Demetras, N. J., & Sedoryk, M. (2021). Efficacy of environmental DNA sampling to detect the occurrence of endangered coho salmon (*Oncorhynchus kisutch*) in Mediterranean-climate streams of California's central coast. Environmental DNA, 3(4), 727-744.

Schmelzle MC, Kinziger AP (2016) Using occupancy modelling to compare environmental DNA to traditional field methods for regional-scale monitoring of an endangered aquatic species. Mol Ecol Res 16(4):895–908

Wilcox, T. M., Carim, K. J., McKelvey, K. S., Young, M. K. & Schwartz, M. K. The dual challenges of generality and specificity when developing environmental DNA markers for species and subspecies of Oncorhynchus. PLoS One 10, 1–13 (2015).

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Attachment 5

Permit Support Memorandum

Permit Support Memorandum

May 17, 2023

To	Joel Gerwein & Fanny Yang (State Coastal Conservancy), Maggie Teicher (North Coast Regional Water Quality Control Board), Melissa Kramer (California Coastal Commission)	**Contact No.**	707.267.2275
Copy to	Jesse Willor & Kelly Allen (City of Eureka)	**Email**	brett.vivyan@ghd.com
From	Brett Vivyan	**Project No.**	12566459
Project Name	Eureka Flood Reduction & Sea Level Rise Resiliency		
Subject	Palco Marsh Water Quality, Environmental and Flood Analyses for the Eureka Flood Reduction & Sea Level Rise Resiliency Project		

1. Introduction

The City of Eureka (City) proposes the Eureka Flood Reduction & Sea Level Rise Resiliency Project (Project) within urbanized coastal areas of the City, to reduce stormwater and tidal flooding, enhance sea level rise resiliency, and improve water quality in Humboldt Bay. The Project was first identified in the Eureka Area Watersheds Storm Water Resources Plan (EAWSWRP), a multi-jurisdiction plan to develop multi-benefit (water quality, water supply, flood management, environmental, and community parameters) stormwater projects. The development of the EAWSWRP included a Technical Advisory Committee consisting of the City of Eureka, County of Humboldt, Humboldt Community Services District, and the North Coast Regional Water Quality Control Board.

The Project has received funding from the following agencies and grant programs:

- Federal Emergency Management Agency (FEMA): Hazard Mitigation Grant Program (HMGP)
  - Any sustainable action that reduces or eliminates long-term risk to people and property from future disasters
- California Natural Resources Agency (CNRA): Urban Flood Protection Program
  - Innovative solutions with multi-benefit approaches to develop sustainable infrastructure that can adapt to changing weather patterns season after season.
- California Department of Water Resources (DWR): Coastal Watershed Flood Risk Reduction Program
  - Program will fund multi-benefit flood risk reduction projects which will:
    - Primarily address coastal flood risk and public safety, and
    - Enhance coastal ecosystems, including fish and wildlife habitat enhancement, and
    - Secondarily promote natural resources stewardship, including preserving working agricultural, rangeland, and forested landscapes wherever possible.

Studies and work products completed to date include the following:

- Biological Resources Evaluation
  - Aquatic Resources/Wetland Delineation
  - Aquatic Species Sampling and eDNA analysis
  - Botanical Surveys
- Cultural Resources
- Phase 1 Corridor Study
- Phase 2 Environmental Site Assessment
- Geotechnical Report
- 65% Design Plans and Hydraulic Modeling
- Draft CEQA IS/MND

The City held a site visit with permitting agency representatives on December 1st 2022 to familiarize staff with the Project, solicit feedback for additional information to include in permit applications, and answer questions. Attendees included representatives from National Marine Fisheries Service (NMFS), Untied States Army Corps of Engineers (USACE), North Coast Regional Water Quality Control Board (NCRWQCB), California Coastal Commission (CCC), and California Department of Fish and Wildlife (CDFW). The City conducted additional outreach to the State Coastal Conservancy (SCC), as the SCC owns an easement over Palco Marsh for which Project components must be compatible.

The purpose of this memorandum is to provide supplemental information, analyses and clarifications regarding the Project to support permitting, based on comments received from the permitting agencies and SCC.

1.1 Project Overview

The Project is comprised of multiple components located throughout the City's west side. Project components aims to achieve the following:

- Reduced flooding of structures and roadways through increased conveyance of the storm drain network by increasing the size of select storm drain pipes and implementing a new storm drain pipe alignment;
- Improved sea level rise and storm resiliency by preserving stormwater storage capacity within the existing stormdrain system by installing tide gates;
- Provide enhancements to flow attenuation and water quality with the implementation of rain gardens in select locations, where space allows within the City right-of-way;
- Prevent trash from entering waterways by installing trash capture devices immediately upstream of three discharge points to Humboldt Bay and one discharge point to Palco Marsh;
- Improved hydraulics within Palco Marsh to more closely resemble natural tidal hydraulics and range by replacing the existing crossing to Humboldt Bay and excavating a channel to connect low elevation areas;
- Enhance subsided and historical salt marsh habitat within Palco Marsh with the reuse application of soils from channel excavation;
- Increase the stormwater discharge capacity from Palco Marsh to Humboldt Bay to offset increases in stormwater conveyance to Palco Marsh; and
- Improve hydraulic control of the exchange between Palco Marsh and Humboldt Bay to manage future sea level rise and salt marsh habitat within Palco Marsh, while providing the ability to expand salt marsh restoration.

A detailed Project Description is provided in Attachment 1 that identifies the specific Project components and the locations, extent, dimensions and other related information. The following sections focus specifically on Project background and information requested by permitting agencies and the SCC.

1.2 Project Development

In accordance with Water Code requirements, the EAWSWRP included a metrics-based evaluation and analysis of multi-beneficial projects that maximize water quality, flood management, environmental, water supply, and other community benefits within the project watershed. Projects were prioritized based on key metrics that contribute to integrated stormwater management and address the project watershed's site-specific conditions.

1.2.1 Multi-Criteria Analysis to Identify Low Impact Development (LID) Best Management Practices (BMP) opportunities

Projects included in the EASWRP were the result of several sources: projects developed as part of the EASWRP, projects identified during outreach, and previously-planned projects. The proposed Project was developed as a part of the EAWSWRP. Projects were screened for Low Impact Development (LID) Best Management Practices (BMP) opportunities using a spatial multi-criteria analysis (MCA). The MCA identified areas in the watershed physically suitable for various LID BMP types by developing screening criteria for type of LID BMP and spatial datasets with the following content: roads, existing and planned bike routes, sidewalks, parcels, elevation, storm water infrastructure, land use, city boundaries, designated trash priority areas, hydrology flow lines, watershed boundaries, locations of existing stormwater projects, flood hazards, locations of known issues, MS4 boundaries, and designated stormwater priority areas. Parcels and road segments were screened and ranked throughout the entire 80,500-acre Eureka Plain Hydrological Unit.

1.2.2 Identification of Projects

Hydrologic and hydraulic models were used to evaluate stormwater runoff characteristics both on the ground surface, and through stormwater infrastructure. These models were utilized to evaluate different storm events, and the change in stormwater flow patterns that may occur if a stormwater project is installed. The model was used in several steps of the Project development and prioritization described below:

- Locate existing areas that may flood during select storm events. Model results included both flooding locations and volumes. These locations were compared to the MCA results and other existing projects to identify multi-benefit project locations.
- Flood reductions were qualitatively estimated based on a visual assessment of model results.
- Evaluated potential effects of sea level rise.

Identified projects were then prioritized using an integrated metrics-based benefits analysis. Metrics used to evaluate the benefits of the identified projects using the Water Board's Storm Water Resource Plan (SWRP) Guidelines, and amended to account for the specific hydrologic and environmental characteristics of the Eureka Area Watersheds (Table 1).

Table 1 Water Board's SWRP Guidelines and metrics used to evaluate projects.

Benefit	Evaluation Criteria
Water Quality	– Increased filtration and/or treatment of runoff – Trash capture – EAWSWRP priority pollutant removal – Nonpoint source pollution control – Conversion of pervious to impervious surface – Water quality monitoring and assessment
Water Supply	– Water Conservation – Water supply reliability – Conjunctive use – Stormwater or dry weather runoff reuse
Flood Management	– Reduced sanitary sewer overflows – Decreased flood risk by reducing runoff rate and/or volume – Increased sea level rise resiliency
Environmental	– Reduced energy use – Reduced greenhouse gas emissions – Provides carbon sink – Re-establishment of the natural hydrograph – Water temperature improvement – Wetland enhancement – Wetland creation – Riparian enhancement – Riparian creation – Fish passage improvement – Urban green space enhancement – Urban green space creation
Community	– Employment opportunities provided – Disadvantaged community – Public education, outreach, and involvement – Public use area enhancement – Public use area creation

The Eureka Flood Reduction & Sea Level Rise Resiliency Project (West Side Eureka Sub-basin Flood Reduction and Climate Adaptation Project) was the highest scoring project based on the evaluation criteria described above. The Project concept was then used to apply for funding to support the advancement of design, permitting and implementation.

1.2.3 Alternatives Evaluation

Hydraulic modeling of existing conditions corroborated observed conditions which shows the most significant flooding occurs in the lower elevation areas, in the vicinity of Commercial Street, along 1st to 4th Streets and along Koster Street between Washington and 14th Streets, and at higher elevations, east of Broadway from 15th Street to Long Street. The lower elevation areas experience chronic flooding during moderate rain events and high tides, while the higher elevations experience flooding during lower frequency storm events. Sea level rise will continue to exacerbate flooding of lower elevations.

Flow attenuation and restoration of the natural runoff hydrograph, such as detention basins and rain gardens, were considered during Project development in the EAWSWRP. However, to achieve a significant flood reduction benefit, the footprint of these flow attenuation strategies would need to be larger than the City could accommodate via property ownership or right-of-way holdings. Therefore, select locations for rain gardens within the right-of-way were identified and included in the Project where feasible.

In the constraints of existing conditions, iterations of hydraulic modeling of the Project concepts showed that flood reduction could be achieved by:

- implementing tide gates to maintain flood storage capacity in the stormdrain system and prevent surcharging of high tides through drain inlets under current and future sea level rise scenarios;
- increasing pipe capacity in select locations; and
- By reducing the volume of conveyance that is currently conveyed to Clark Slough (at the intersection of Washington and Koster), and Humboldt Bay via Commercial Street.

Reducing this runoff volume can be achieved by rerouting a portion of the flow from the upper watershed, westward to other outfalls, which include the 14th Street area and Del Norte Street/Railroad Avenue areas. Rerouting flow to the Del Norte Street/Railroad Avenue location was selected, as the location exhibited the greatest available capacity.

Del Norte/Railroad/Palco Marsh Alternatives Development and Selection

A detailed discussion of three alternatives evaluated for this outfall location is presented below, followed by a discussion and evaluation of project benefits. The discussion includes a new pipe in Del Norte Street to convey stormwater runoff from the upper watershed, that currently floods low elevation areas in the vicinity of Koster Street and Commercial Street, and redirect that flow to 1) a new outfall to Humboldt Bay, 2) the existing outfall to the channel between Palco Marsh and Del Norte Park (Palco/Park Channel) and 3) the existing outfall in Palco Marsh and crossing to Humboldt Bay. A trash capture device would be implemented upstream of the discharge point for all alternatives.

Existing Conditions

The existing stormwater facilities in the vicinity of Del Norte Street, Railroad Avenue and Palco Marsh consist of a culvert that conveys stormwater from the Simpson channel to the Palco/Park channel under Del Norte Street, and stormwater conveyance pipes in Del Norte Street and Railroad Avenue that flow to a stormwater structure within Palco Marsh (Figure 1). The stormwater structure is designed to primarily convey stormwater west through three 30-inch diameter pipes to the Palco/Park channel. Flow through these pipes is regulated by tide gates to only allow flow one way, from the stormwater structure to the channel. If flow cannot flow through in this direction, due to higher hydraulic head or blockage, stormwater is discharged directly to Palco Marsh from the stormwater structure.

The Palco/Park channel regularly fills with sediment from Humboldt Bay and requires regular dredging to maintain stormwater conveyance from the Palco Marsh structure and Simpson Channel. The Simpson channel is a known soil contamination site for dioxins and furans. Due to the frequent blockage, stormwater conveyance through the Del Norte Street crossing from the Simpson channel is limited and stormwater conveyance from the Palco Marsh structure discharges directly to Palco Marsh.

The existing crossing between Palco Marsh and Humboldt Bay conveys a portion of the ebb and flood tides in and out of Palco Marsh, as well as stormwater from Palco Marsh to Humboldt Bay. The tidal range within Palco Marsh is muted, typically between elevation 3 ft and 5.3 ft when water levels in Humboldt Bay range from 0 ft to 6.5 ft (approximate MLLW to MHHW in NAVD88). The muted tidal range is due to the flow constriction created by a 48” diameter HDPE pipe that transitions to two 18” diameter pipes. The crossing configuration is known as an inverted siphon that is designed to use hydraulic head pressure on lower elevation sections of pipe (two 18” diameter pipes) to convey flow up to a higher elevation section (48” diameter pipe) to avoid (go under) utilities that cross the alignment.

Figure 1. Existing Stormwater Facilities at Del Norte/Railroad/Palco Marsh

Alternatives Evaluated

Three alternatives were developed and assessed that focused on the stormwater discharge location. The three locations included a new outfall location to Humboldt Bay adjacent to the Del Norte Pier, the existing discharge location to the Palco/Park channel, and the existing discharge location to Palco Marsh in combination with replacement of the existing crossing from Palco Marsh to Humboldt Bay (inverted siphon) with a larger capacity crossing.

Alternative #1: Humboldt Bay Adjacent to Del Norte Pier

The new stormdrain pipe along Del Norte Street could be located to outlet into a new stormwater structure with flap gates, and relocate the existing discharge point from the Palco/Park channel to discharge directly to Humboldt Bay (Figure 2). The system would operate similar to existing, when hydraulic conditions prevent flow through the flap gates to Humboldt Bay, stormwater discharge may flow to Palco Marsh. This configuration would require a new permitted discharge to Humboldt Bay and require excavation of a channel, approximately 1 foot deep through the existing mudflats known to support eel grass, an essential fish habitat. The total stormwater discharge to Palco Marsh would remain similar to existing conditions. This alternative requires more extensive Project footprint and impact within Humboldt Bay. Isolation of the area to complete channel excavation would have a higher potential for impact to state and federally listed species, such as eel grass, long-fin smelt and salmonids, compared to other alternatives.

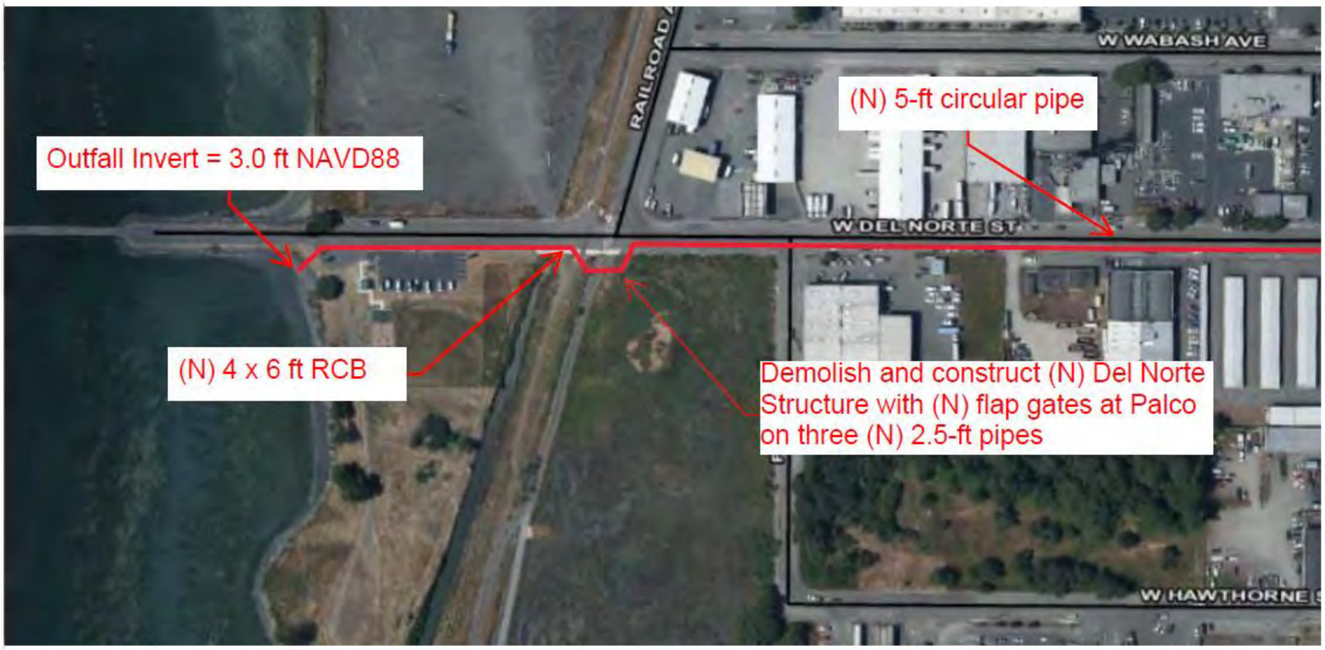

Figure 2. Conceptual configuration to relocate the storm water outfall to a direct discharge to Humboldt Bay at Del Norte Pier.

Alternative #2: Existing Palco/Park Channel

Similar to the existing configuration maintaining the discharge point in the Palco/Park channel was evaluated. In an effort to avoid the location of continual sedimentation that causes diminished function of the outfall, the location would be moved south within the existing channel (Figure 3). However, without regular dredge maintenance of the channel, this location will likely also accrete during times of diminished stormwater flow, annually during the dry weather months, and other times of reduced rainfall. The location could be modified to allow tide exchange and abandon the existing Palco Marsh to Humboldt Bay crossing, which would require additional excavation of the channel to accommodate the increased tidal prism and stormwater. The channel upstream (Simpson Channel) exhibits known soil contamination to the north, which is likely present in the soils throughout the channel and disturbance of this area may mobilize contaminated sediment during Project construction and during regular dredging maintenance activities.

Figure 3. Conceptual configuration to modify the existing storm water outfall to the existing channel between Palco Marsh and Del Norte Park.

Alternative #3: Existing Palco Marsh and Inverted Siphon

The third alternative evaluated was to abandon the existing discharge point and pipes to the Palco/Park channel, replace the existing stormwater structure in Palco Marsh with a new outfall with a flap gate, excavate a channel through Palco Marsh, and increase the size and capacity of the existing crossing to Humboldt Bay (Figure 4). This alternative reduces the total number of discharges directly to Humboldt Bay and avoids ongoing maintenance needs required to operate the outfall to the Palco/Park channel. The increased discharge of stormwater to Palco Marsh may be balanced with increased discharge capacity to Humboldt Bay to avoid potential changes to habitats in Palco Marsh. Modification of the crossing to Humboldt Bay will allow for improved hydraulic control of water levels under existing and sea level rise conditions, as the marsh has subsided and historical marsh has turned to mudflat. This alternative was selected to move forward with design and permitting, as the environmental impacts are anticipated to be less than the other alternatives and the enhanced hydraulic control allows the City to better manage the system to achieve multiple benefits. The conceptual alternative was further developed and modeled and a detailed discussion of the Project benefits and avoidance of impacts to Palco Marsh is provided below.

Figure 4. Conceptual configuration to modify the existing storm water outfall to Palco Marsh and crossing from Palco Marsh to Humboldt Bay.

1.3 Discussion of Project Benefits and Project Components

All runoff from the Project Area and contributing watersheds discharges to Humboldt Bay. A portion of the runoff is routed through Palco Marsh. Historically, Palco Marsh would have been a small portion of a larger marsh footprint along the shoreline. Seasonal streams would have discharged through or across the marsh plain. Early development filled the marsh plain and converted open channel freshwater flows to pipe flow, reducing the extent of the transition zone between freshwater and tidal areas. Palco Marsh remains hydraulically connected to Humboldt Bay through an inverted siphon that limits the full tidal range from entering and exiting and allows existing stormwater entering Palco Marsh to be conveyed to Humboldt Bay.

An overview of the Project components and changes to the contributing drainage areas is shown in Figure 5. The project results in redirection of storm water runoff from the upper watershed (dark blue are on existing graphic) that currently discharges at Commercial, Washington, and 14th Streets Outfalls, to the Palco Marsh outfall (dark green on proposed graphic). Project benefits and mitigations of impacts are discussed below.

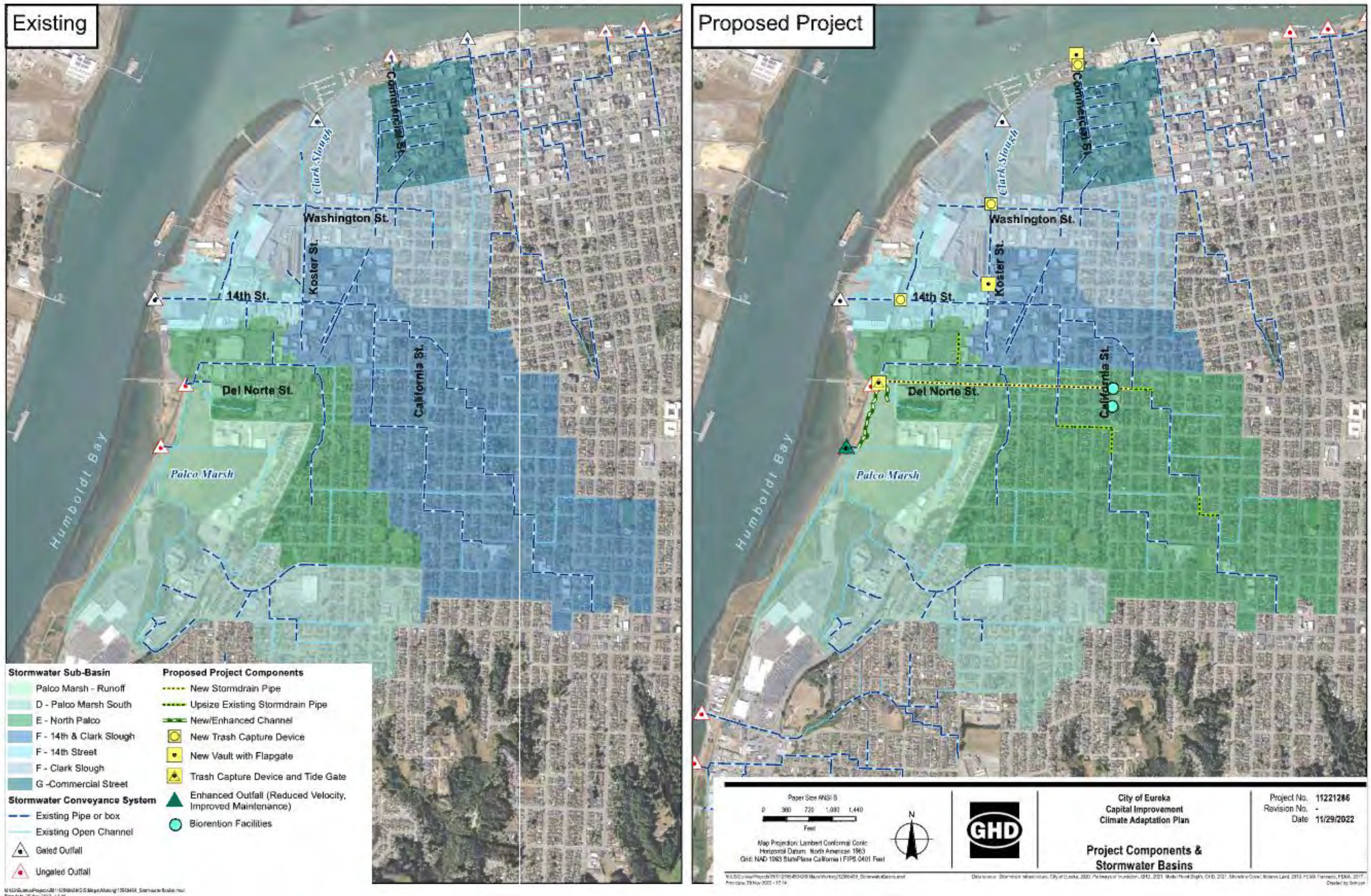

Figure 5 *Project components and changes to stormwater sub-basins.*

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1.3.1 Water Quality

As part of MS4 permitting, the Project provides water quality benefits consisting of rain gardens in select locations to provide filtration and/or treatment of runoff; trash capture devices to remove particles that are 5 mm or greater before discharging to Humboldt Bay and Palco Marsh; and improved access upstream of outfalls to conduct water quality monitoring and assessment.

The implementation of the new stormdrain pipe along Del Norte Street will increase the contributing runoff area to Palco Marsh from 396 acres to 685 acres and reduces the runoff to the other locations that discharge directly to Humboldt Bay (14th Street, Koster/Washington Street, and Commercial Street) (Table 2). Runoff associated with the 85th percentile storm event and changes to contributing drainage areas are shown in Table 3. The stormwater systems discharging at 14th Street, Koster/Washington Street, and Commercial Street are interconnected, resulting in mixing of varying proportions depending on several factors including tidal water levels and storm event intensity. The additional 289 acres of runoff contributions include residential (255 acres), commercial (30 acres) and open space (4.5 acres). In total, approximately 27% (289 acres or 15.7 acre-ft) of the total watershed (1,076 acres or 58.3 acre-ft) will be conveyed to Palco Marsh instead of directly to Humboldt Bay via three discharge locations.

Table 2 Changes in contributing runoff area based on land use to Palco Marsh and directly to Humboldt Bay

Land Use	Existing (acres)	Proposed (acres)	Change (acres)
Direct Runoff Area to Palco Marsh then Humboldt Bay			
Commercial	119.5	149.5	30.0
Industrial	47.9	47.9	0.0
Open Space	33.8	38.3	4.5
Residential	194.4	449.5	255.1
Total	**395.7**	**685.3**	**289.6**
Direct Runoff Area to Humboldt Bay (14th Street, Koster/Washington Street, and Commercial Street)			
Commercial	203.9	173.9	-30.0
Industrial	132.1	132.1	0.0
Open Space	4.5	0.0	-4.5
Residential	339.4	84.3	-255.1
Total	**679.9**	**390.3**	**-289.6**

Table 3 Changes in runoff from 85th percentile storm based on land use to Palco Marsh and directly to Humboldt Bay

Land Use	Existing (acre-ft)	Proposed (acre-ft)	Change (acre-ft)
Direct Runoff Area to Palco Marsh then Humboldt Bay			
Commercial	6.5	8.1	1.6
Industrial	2.6	2.6	0.0
Open Space	1.8	2.1	0.2
Residential	10.5	24.3	13.8
Total	**21.4**	**37.1**	**15.7**
Direct Runoff Area to Humboldt Bay (14th Street, Koster/Washington Street, and Commercial Street)			

Land Use	Existing (acre-ft)	Proposed (acre-ft)	Change (acre-ft)
Commercial	11.0	9.4	-1.6
Industrial	7.2	7.2	0.0
Open Space	0.2	0.0	-0.2
Residential	18.4	4.6	-13.8
Total	**36.8**	**21.1**	**-15.7**

Site-specific stormwater monitoring data (flow and contaminants) is not available within the contributing runoff area. To evaluate changes in the pollutant loading to Palco Marsh and Humboldt Bay, pollutant concentrations from the National Stormwater Quality Database are used and summarized in Table 4. Industrial land uses exhibit the highest copper and zinc concentrations but the lowest nitrate concentrations. Residential land uses exhibit the highest nitrate concentrations and lowest copper and zinc concentrations. Commercial land uses exhibit concentrations in between the two and open space is assumed to not contribute to these pollutants.

Table 4 Estimated pollutant concentrations based on land use[1]

Land Use	Total Copper (ug/L)	Total Zinc (ug/L)	Nitrate (mg/L)
Residential	12	73	0.94
Commercial	17	150	0.62
Industrial	22	210	0.48
Open Space	0	0	0

Assuming full mixing of stormwater runoff volumes resulting from the 85th percentile storm and land uses described in Table 2,

Table 3 and Table 4, the changes to pollutant concentrations for existing and proposed conditions are presented in Table 5 (below). The increase in residential runoff contributions to Palco Marsh result in increased dilution thereby reducing copper and zinc concentrations of 0.15 ug/L and 7.88 ug/L, respectively. Nitrate increases by 0.10 mg/L. The inverse relationship is exhibited for the other discharge locations directly to Humboldt Bay, with an increase in copper and zinc, 2.25 ug/L and 31.45 ug/L, respectively, and decrease in nitrate of 0.11 mg/L. As stated above, these concentrations only represent the stormwater and mixing with tide water that would occur in both Palco Marsh and Humboldt Bay, which would dilute the stormwater and result in reduced concentrations of all pollutants. Additionally, under proposed conditions, the excavated channel would increase the tidal volume available for mixing at any given water level within the marsh, resulting in additional dilution.

[1] Pitt, R., A. Maestre and R. Morquecho. 2004. The National Stormwater Quality Database (NSQD, version 1.1). Paper presented at the World Water and Environmental Resources Congress, Salt Lake City, UT. http://rpitt.eng.ua.edu/Research/ms4/Paper/Mainms4paper.html; see also the National Stormwater Quality Database at http://www.bmpdatabase.org/nsqd.html.

Table 5 Changes in runoff pollutant concentrations in Palco Marsh and directly to Humboldt Bay with the proposed project

Pollutant	Existing Concentration	Proposed Concentration	Change
Direct to Palco Marsh then Humboldt Bay			
Total Copper (ug/L)	12.72	12.57	-0.15
Total Zinc (ug/L)	100.07	92.19	-7.88
Nitrate (mg/L)	0.64	0.74	0.10
Direct to Humboldt Bay (14th Street, Koster/Washington Street, and Commercial Street)			
Total Copper (ug/L)	15.36	17.61	2.25
Total Zinc (ug/L)	122.22	153.67	31.45
Nitrate (mg/L)	0.75	0.64	-0.11

In both existing and proposed conditions, stormwater discharge passes through Palco Marsh to Humboldt Bay. Therefore the duration for which stormwater is detained within the marsh and pollutant concentration of stormwater are the primary influences on marsh water quality and vegetation uptake of pollutants, as opposed to the total volume of stormwater and total mass of pollutants. No changes to the pollutant load to Humboldt Bay occurs given there is no change to the total contributing watershed discharge to Humboldt Bay.

The duration of stormwater detention within the marsh is affected by the flow rate and duration of stormwater discharge into the marsh, the flow rate of discharge from the marsh to Humboldt Bay, and tidal water levels. Pollutant concentration within Palco Marsh is a result of the stormwater discharge volume and pollutant concentration described above and the volume and pollutant concentration of tidal water that has entered Palco Marsh from Humboldt Bay through the inverted siphon. In general, under both existing and proposed conditions, during an ebb (outgoing) tide, stormwater may continually discharge from Palco marsh to Humboldt Bay. During flood tide, stormwater will be prevented from flowing out of Palco Marsh due to the incoming tide and higher water level in Humboldt Bay compared to Palco Marsh. The 85th percentile storm event was modeled and evaluated for existing and proposed conditions in combination with two tidal scenarios on Humboldt Bay, as measured at the North Spit, CA - Station ID: 9418767: a high tide event reaching 7.7 feet (NAVD) (85th percentile higher high tide) then dropping to 1.9 feet (NAVD) and a static tidal water level of -0.34 feet (NAVD), representing Mean Lower Low Water (MLLW).

The high tide event results in both tidal waters and runoff entering Palco Marsh (Figure 6). Tidal flow from Humboldt Bay (North Spit) continually enters Palco Marsh so long as water levels in Humboldt Bay are greater than water levels in Palco Marsh. This hydraulic condition results in all stormwater discharges to Palco Marsh remaining in the marsh and mixing with tidal waters. The mixed water within Palco Marsh begins to discharge to Humboldt Bay on the ebb tide, once water levels in Palco Marsh are greater than water levels in Humboldt Bay. Under proposed conditions, the peak water level in Palco Marsh is greater than existing conditions, but water levels within the marsh drop at a faster rate, more similar to the flood tide water levels, and reach a lower water level, discharging nearly all stormwater and tidal waters within one tidal cycle before the flood tide prevents discharge to Humboldt Bay and begins to fill Palco Marsh again. Although existing conditions exhibits less stormwater entering Palco Marsh, the discharge capacity of this stormwater is limited and does not fully drain before the flood tide prevents further drainage and stormwater and tide water begin filling Palco Marsh. Although proposed conditions result in a larger volume of stormwater entering Palco Marsh, this stormwater is held in the marsh for a shorter duration and the basin drains more effectively.

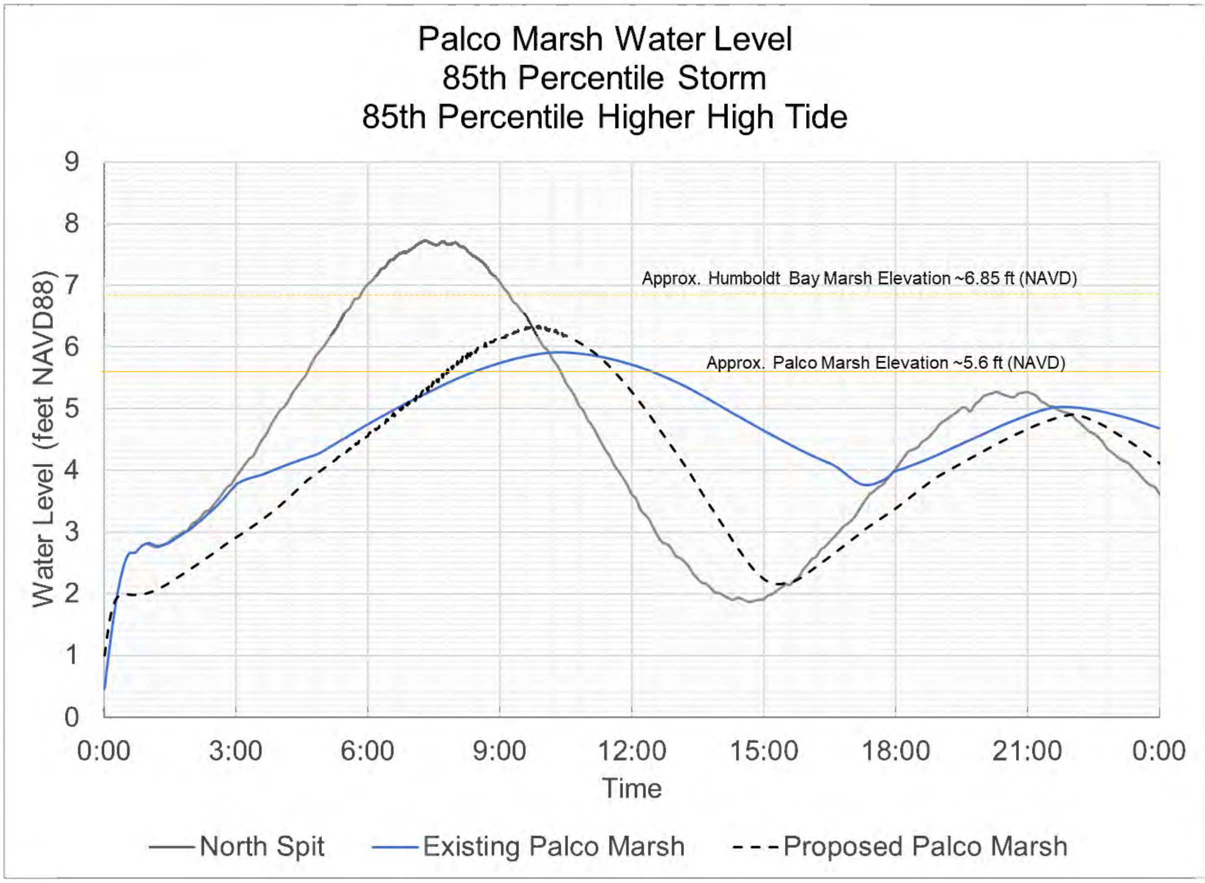

Figure 6 ***The increased stormwater discharge capacity from Palco Marsh to Humboldt Bay results in a reduced duration of stormwater detention within Palco Marsh and water levels with a more similar tidal signature to a natural system during a high tide event.***

The static tidal elevation at MLLW results in stormwater being continually discharged from Palco Marsh to Humboldt Bay (Figure 7). Without the influence of tidal waters entering Palco Marsh, stormwater freely flows through Palco Marsh channel and is discharged through the crossing to Humboldt Bay. Water levels under proposed conditions are continually lower than those of existing conditions due to the new channel grading, deepening of the existing channels, and lowering of the crossing invert. Existing stormwater discharge results in water levels ranging from elevation 2.2 feet to 2.7 feet, while proposed water levels range from elevation 1.0 feet to 1.6 feet.

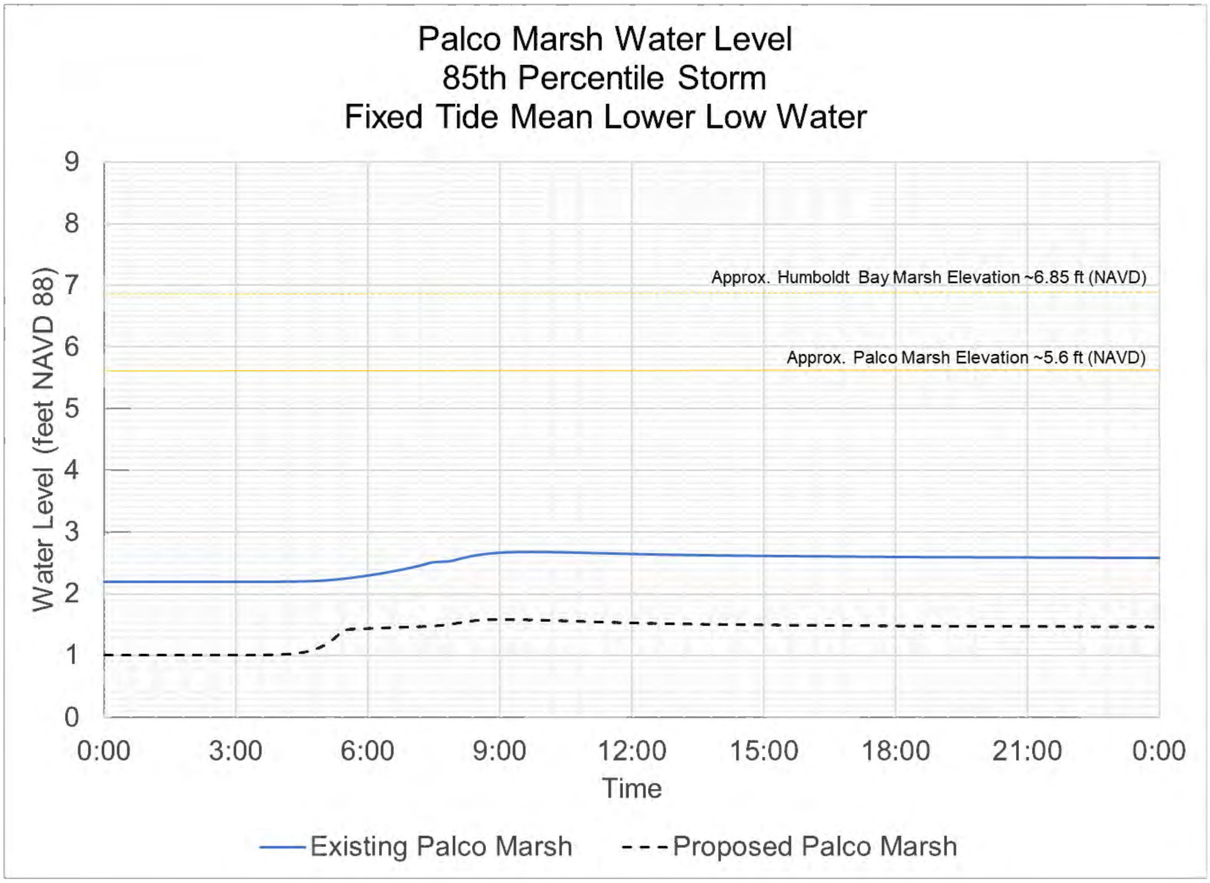

Figure 7 The increased stormwater discharge capacity from Palco Marsh to Humboldt Bay results in a reduced duration of stormwater detention with Palco Marsh and lower water levels when absent of tidal influence.

Under proposed conditions, a relatively small increase in nitrate and reduction in zinc and copper occurs, with nearly complete discharge of stormwater within a single tidal cycle from Palco Marsh. Existing conditions continue to store stormwater over multiple tidal cycles. Thus proposed conditions reduces the contact time of stormwater with the marsh. The proposed Project is not anticipated to diminish water quality and marsh habitat within Palco Marsh.

1.3.2 Environmental

Environmental benefits of the project are focused on Palco Marsh and Humboldt Bay and include removal of trash to all discharge locations within the Project area; beneficial reuse of excavated soils for marsh creation in locations that have subsided and lost marsh; improved aquatic organism passage through the Palco Marsh to Humboldt Bay crossing by reducing peak velocities and increase the duration of acceptable fish passage velocities; increased tidal circulation with the excavation of a new channel to connect a low-elevation tidal pond to regular tidal flow; lowering of low tide to increase the tidal range and more closely match a natural tidal cycle; improved hydraulic control of water levels within the marsh to manage for sea level rise within a subsided marsh area lacking sediment deposition sources; and discontinuation of dredging practices within the Palco/Park channel. Each of these benefits are discussed below. Special consideration is given to the anticipated effect on vegetative communities based on agency inquiries.

Effect on Vegetative Communities

In 1987 a study was conducted by Annie Eicher (Eicher, 1987) to document the relationship of inter-tidal salt marsh vegetation verse elevation in Humboldt Bay (Figure 8). The persistence of salt marsh vegetation is primarily a function the species tolerance to frequency and duration of tidal inundation. The data collected by Eicher in open inter-tidal habitats has been used to project salt marsh vegetation recruitment based on muted tidal inundation frequency for local muted tidal restoration projects including Salmon Creek Restoration Project at the Humboldt Bay National Wildlife Refuge and the Martin Slough Enhancement Project within the City of Eureka, both tributaries to Humboldt Bay.

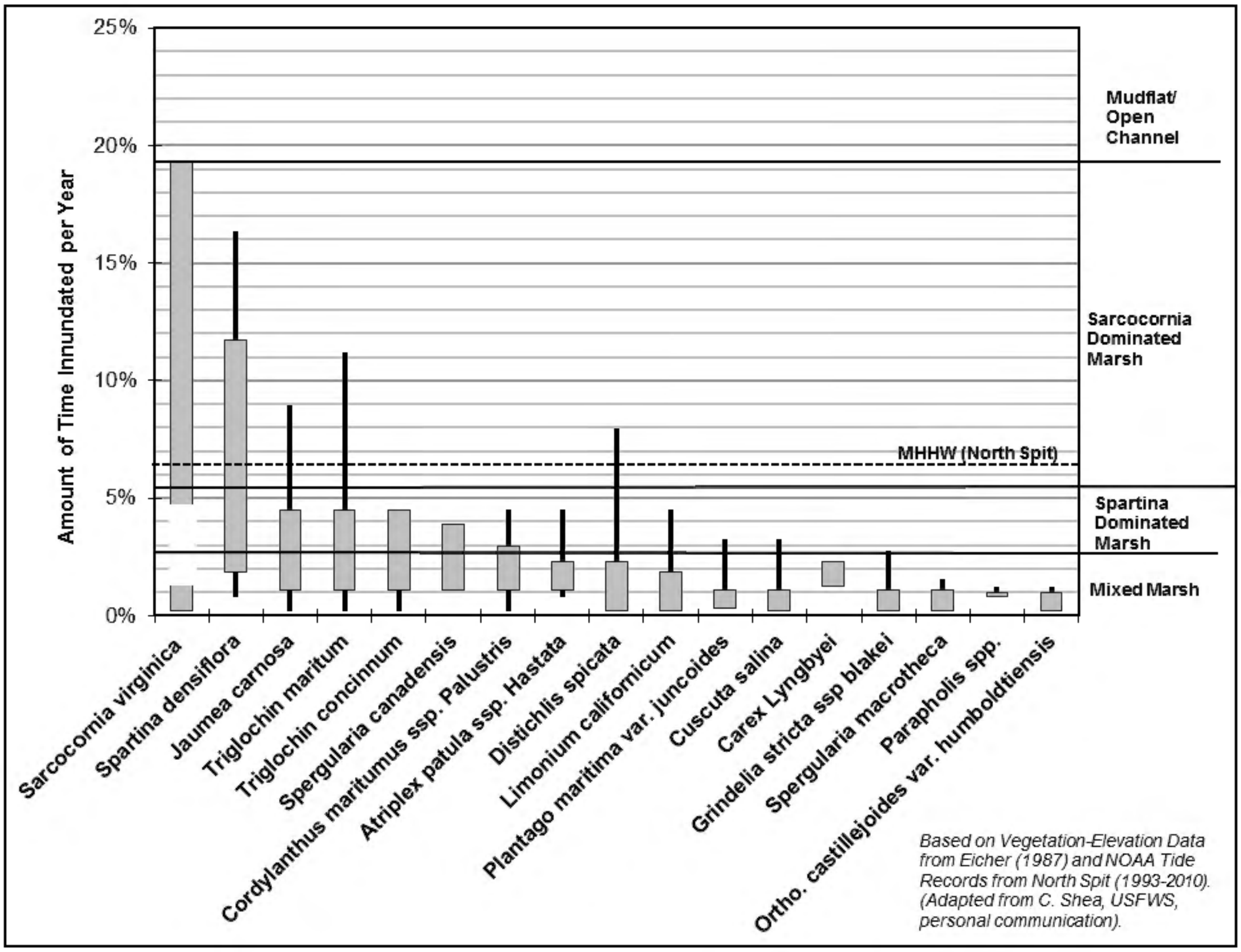

Figure 8 ***Relationship between inundation percentage and salt marsh vegetation (Eicher 1987)***

Eicher (1987) concluded for Humboldt Bay that mudflats and tidal channels are inundated over 19 percent of the time and no salt marsh species are present at these low elevations. Sarcocornia dominated marshes are inundated between 5 and 19 percent of the time. Sarcocornia dominated marshes are characterized with the presence of only four other species. Spartina dominated marshes, at a slightly higher elevation, is inundated between approximately 3 and 5 percent of the time and up to 10 other marsh species are present, though Spartina dominates. Mixed marshes, inundated less than 3 percent of the time, have the greatest species diversity with the presence of 22 species, with no individual species dominating. Sarcocornia is present in the mixed marshes, but not present in the Spartina dominated marshes. Eicher speculated that the invasive Spartina out-competes Sarcocornia, resulting in a gap in its representation at middle elevations.

A comparison between the existing and proposed inundation regimes in Palco Marsh can be used indicate whether or not changes would be expected in salt marsh species assuming no significant changes to marsh plain elevations. The tidal range within Palco Marsh is muted, typically between elevation 3 ft and 5.3 ft when water levels in Humboldt Bay range from 0 ft to 6.5 ft and is controlled by the inverted siphon crossing (Figure 9). This conveyance structure will be replaced with a larger, similar structure with tide gates mounted on rails for vertical adjustment to allow for adjustable muting of tidal exchange. The Project tide gate elevations have been modeled and adjusted to identify the configuration for which existing peak water levels and flood tide rates will be maintained. On the ebb tide, the full capacity of the structure is utilized to more closely match unobstructed tidal hydraulics (Figure 9). The resulting tidal inundation duration is therefore similar to existing and would not be expected to change vegetative communities. Following construction, water levels can be monitored within Palco Marsh and the adjustable tide gates will be set to maintain inundation regimes.

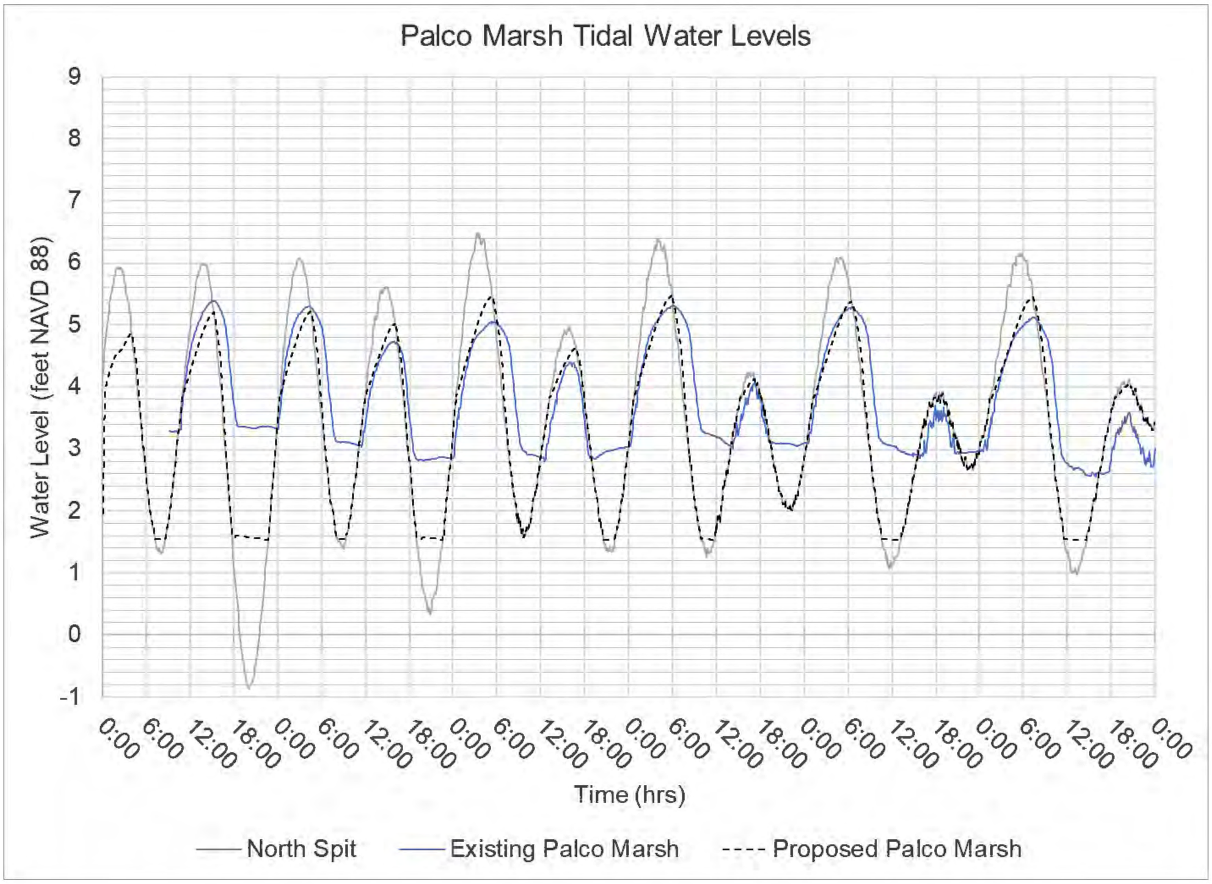

Figure 9 Existing and proposed water levels within Palco Marsh compared to existing tidal water levels in Humboldt Bay at the North Spit gage.

Additional consideration to water levels and inundation associated with the increased discharge of stormwater to Palco Marsh was assessed. As shown previously in Figure 6, under proposed conditions, while the increased runoff areas contributing to the Del Norte Street stormdrain pipe will discharge more stormwater into Palco Marsh, the proposed replacement of the existing crossing with a larger capacity crossing will increase the rate of stormwater discharge from Palco Marsh to Humboldt Bay. This increased discharge rate to Humboldt Bay results in a reduced duration for which stormwater is stored within the marsh and interacts with vegetation. The duration of marsh plain inundation, with water levels above elevation 5.6 ft in Palco Marsh, is similar between existing and proposed conditions, with proposed conditions slightly reducing the duration of inundation, increasing the depth, and achieving a lower minimum water level (Table 6).

Table 6. Comparison of water levels and duration of stormwater inundation and presence in Palco Marsh for existing and proposed conditions for the 85th percentile storm event.

Parameter	Existing	Proposed
85th Percentile 24-hr Storm Event and 85th Percentile Higher High Tide		
Duration of Marsh Plain Inundation (hrs)	4.0	3.8
Maximum Water Level (ft)	5.9	6.3
Minimum Water Level (ft)	3.8	2.2
Duration of Stormwater Detention in Palco Marsh (hrs)	2+ tidal cycles (>24 hrs)	1 tidal cycle (12 hrs)

Under the 10-yr storm event and 85th percentile higher high tide, the proposed conditions result in more effective discharge of stormwater to Humboldt Bay, and reduce the duration of marsh plain inundation (Figure 10 and Table 7). The existing structure between Palco Marsh and Humboldt Bay is limited in conveyance capacity and runoff to Palco Marsh is equal to the discharge through the crossing, resulting in sustained freshwater inundation of the marsh plain for multiple tidal cycles, while proposed conditions water levels reach marsh plain elevations within two tidal cycles.

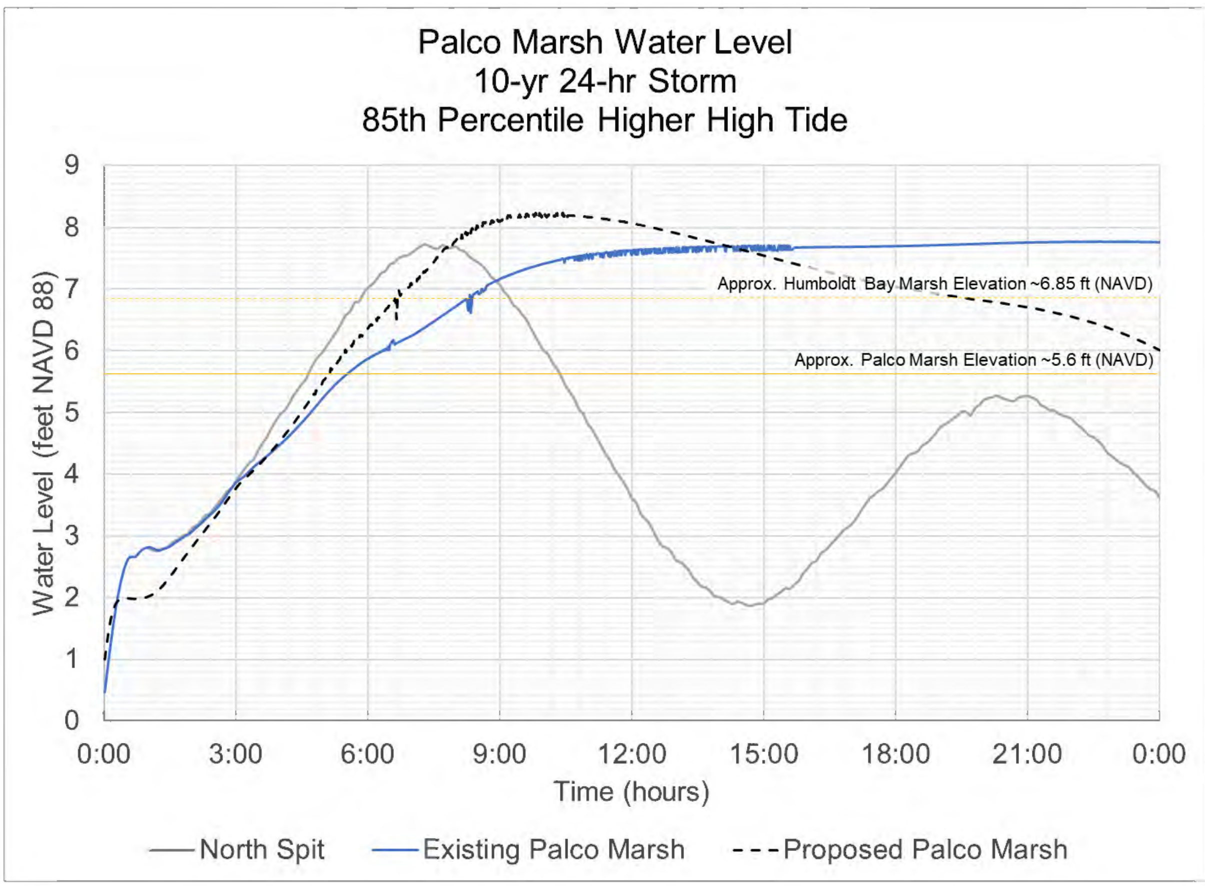

***Figure 10** Existing stormwater discharge to Palco Marsh for the 10-year storm detains stormwater for multiple tidal cycles while the Project discharges the stormwater to Humboldt Bay within two tidal cycles.*

Table 7. Comparison of water levels and duration of stormwater inundation and presence in Palco Marsh for existing and proposed conditions for the 10-yr event.

Parameter	Existing	Proposed
10-yr 24-hr Storm and 85th Percentile Higher High Tide		
Duration of Marsh Plain Inundation (hrs)	18.5+	8.4
Maximum Water Level (ft)	7.8	8.0
Marsh Plain Inundation	> 24 hrs	~18 hrs
Duration of Stormwater Detention in Palco Marsh (hrs between storm onset and minimum tidal elevation)	2+ tidal cycles (>24 hrs)	2 tidal cycles (>24 hrs)

Existing populations of *Phragmites* australis (common reed) are present within Palco Marsh (Gedik, 2017). Habitats within Palco Marsh that support Phragmites include estuarine emergent with freshwater and muted tidal influences, isolated palustrine emergent wetland with relic saline soils, and palustrine emergent. The potential for increased freshwater concentrations resulting in reduced salt marsh and increased Phragmites is not supported based on model results. The modeling shows that stormwater is discharged from Palco Marsh quicker and more completely in proposed conditions. The north end of Palco Marsh transitions from fresh to brackish to salt marsh vegetation. There is not currently a defined path for freshwater/stormwater to flow after discharging to Palco Marsh and flows overland until reaching the subsided salt marsh and mudflats. The proposed channel will convey freshwater away from this area more effectively and in combination with the modifications to the crossing to Humboldt Bay, lowers minimum water levels (lower tides) that would allow the area to drain more effectively. Additionally, tidal waters would be conveyed further north in the system.

The proposed project matches the existing marsh tidal inundation frequency in the absence of stormwater, which occurs most of the year and influences the persistence of salt marsh vegetation. During rain events, although the total volume of stormwater increases, the duration of marsh plain inundation is less than existing conditions. During more frequent rain events (85^{th} percentile) a portion of the stormwater remains within the marsh for multiple tidal cycles under existing conditions and is discharged in one tidal cycle with Project implementation. During larger, less frequent rain events, stormwater inundation duration is also reduced with Project implementation. Given these characteristics, the Project would not be expected to result in a change to vegetative communities within Palco Marsh.

Aquatic Organism Passage

Aquatic organism passage into and out of Palco Marsh is influenced by the velocity through the crossing. CDFW and NMFS fish passage velocity criteria range from 2 to 6 ft/sec for juvenile and adult salmonids, respectively. During tidal conditions, including the 85^{th} percentile higher high tide, over a 24 hour period, existing velocities meet juvenile fish passage conditions an average of 3.6 hours per day and meet adult conditions 12.1 hours per day (Table 8 and Figure 11). Under proposed conditions, juvenile fish passage conditions are met an average of 13.7 hours per day and adult conditions are met 23.5 hours per day. Fish passage design criteria for other listed aquatic dependent species such as Long-fin smelt and Tidewater Goby do not exist, however the reduction in velocity at the crossings will greatly improve access to Palco Marsh relative to existing conditions.

Table 8. Fish passage conditions met during a given 24 hour period are increased with replacement of existing crossing from Palco Marsh to Humboldt Bay.

Parameter	Existing	Proposed
Juvenile Fish Passage Conditions Achieved (average hrs/day) 2 ft/sec	3.6	13.7
Adult Fish Passage Conditions Achieved (average hrs/day) 6 ft/sec	12.1	23.5

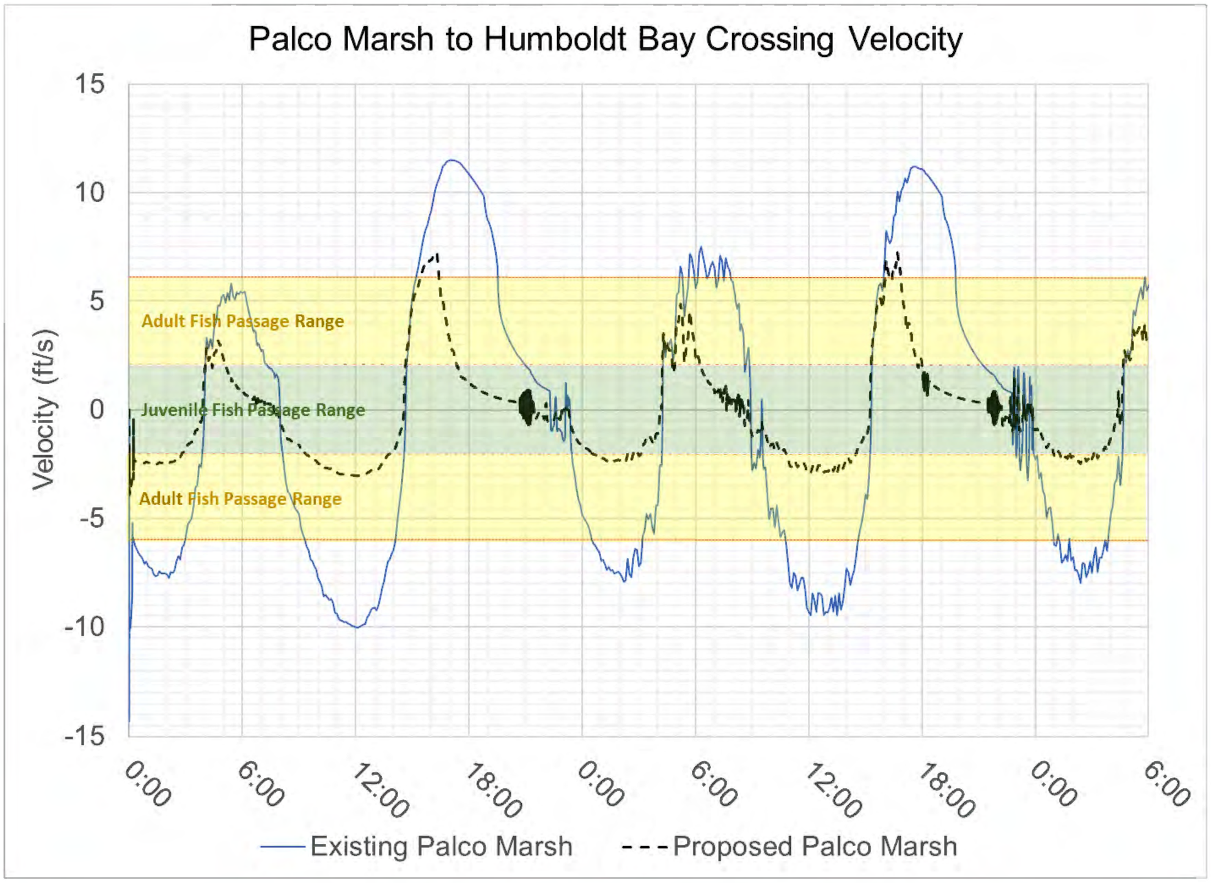

Figure 11. Existing and proposed velocities within the inverted siphon.

Beneficial Reuse of Sediment and Sea Level Rise Management

Prior to anthropogenic modifications, Palco Marsh was part of a larger salt marsh network along the Humboldt Bay shoreline. With the construction of the railroad, the marsh area was disconnected from Humboldt Bay tidal sediment sources (Figure 12). Salt Marsh elevations are typically coincident with a small range above and below Mean Higher High Water (MHHW). MHHW at the open tidal location of the Palco Marsh to Humboldt Bay crossing is 6.5 ft (NAVD 88). Salt marsh areas of Palco Marsh typically exhibit an elevation between 5 and 6 feet (NAVD 88) suggesting land subsidence and lack of mineral sediment deposition (Figure 13). Several areas of the historical marsh plain within Palco Marsh have transitioned from salt marsh to mudflat due to the compounding effects from land subsidence and lack of sediment supply to maintain marsh elevations. Cascadia Geosciences documented the Humboldt Bay area, including Palco Marsh, is subsiding due to plate tectonics (Cascadia GeoSciences, 2017). USGS conducted a study of Humboldt Bay salt marshes noting that increases to sediment supply, as a result of climate projections of increased precipitation and streamflow may partially or wholly mitigate sediment demand caused by the combined effects of subsidence and SLR (USGS, 2021). However, historical isolation of Palco Marsh and limited exchange through the existing crossing does not provide equivalent availability of sediment compared to salt marshes experiencing the full tidal range in Humboldt Bay.

As sea levels rise, the tidal range within Humboldt Bay and Palco Marsh will shift up in elevation, increasing the duration of inundation on the marsh plain and without adequate sediment supply or intervention, salt marshes risk converting to mudflat. Excavated soils from the proposed channel would be placed in areas within Palco Marsh that were historically salt marsh and have transitioned to mudflat or would be used to increase the elevation of lower elevation salt marsh to prolong the life of the salt marsh habitat with additional sea level rise. Replacement of the existing crossing from Palco Marsh to Humboldt Bay will provide additional hydraulic control to manage Palco Marsh for salt marsh habitat. In the absence of available sediment accretion on the marsh, the crossing could be adjusted to maintain current water levels under future sea level rise conditions.

Additionally, future sea level rise retreat strategies, such as an expansion of tidal marsh habitat adjacent to Palco Marsh, would require increased tidal conveyance at the crossing to provide adequate hydraulics, which could be achieved with the new crossing structure and adjustments to the tide gate elevations.

Figure 12 ***(Left) 1870 U.S. Coast Survey Map, (Right) Palco Marsh – 1931 (image source: Laird et al. (2007): Historical Atlas of Humboldt Bay and Eel River Delta.***

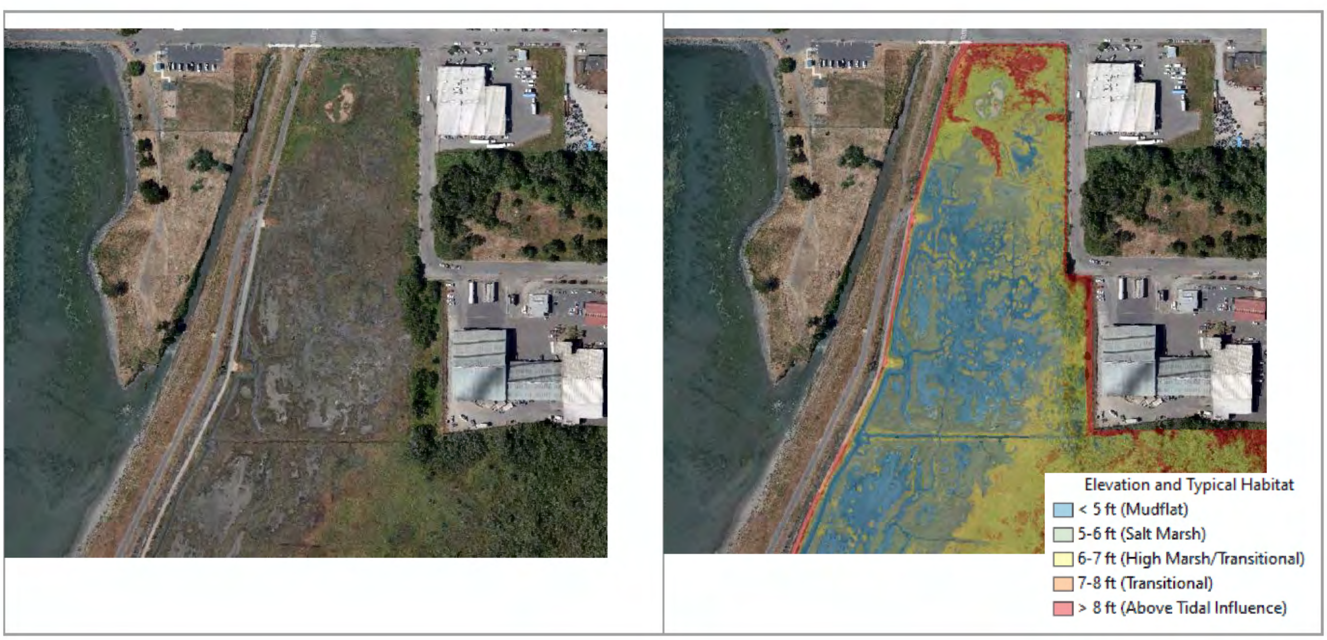

Figure 13 ***(Left) aerial imagery of Palco Marsh showing mud flat area where salt marsh once persisted, (Right) elevation and habitat relationships.***

Increased Tidal Range and Circulation

As previously described, the Project will maintain the upper tidal range relative to existing conditions, however will increase the bottom end of the tidal range within Palco Marsh (see Figure 9). Due to the limited hydraulic exchange within Palco Marsh, tidal channels are limited and typically exhibit higher elevations than natural tidal systems. The tidal channel flowing out of Palco Marsh is approximate elevation 0 ft, while tidal channels within Palco Marsh are typically elevation 3 feet. The northern area of Palco Marsh receives limited tidal exchange due to a lack of tidal channels. The Project proposes to implement a channel between elevation 1.5 to 2.5 feet to both convey tidal exchange on the ebb and flood tides, as well as stormwater from the proposed, modified outlet (Figure 14). Implementation of the new channel and modifications to the crossing result in more similar hydraulics, presented previously, as a natural tidal cycle during typical tides and storm events. Lowering the lowest tide elevations will promote more natural tidal hydrology that benefits tidal circulation and sediment distribution.

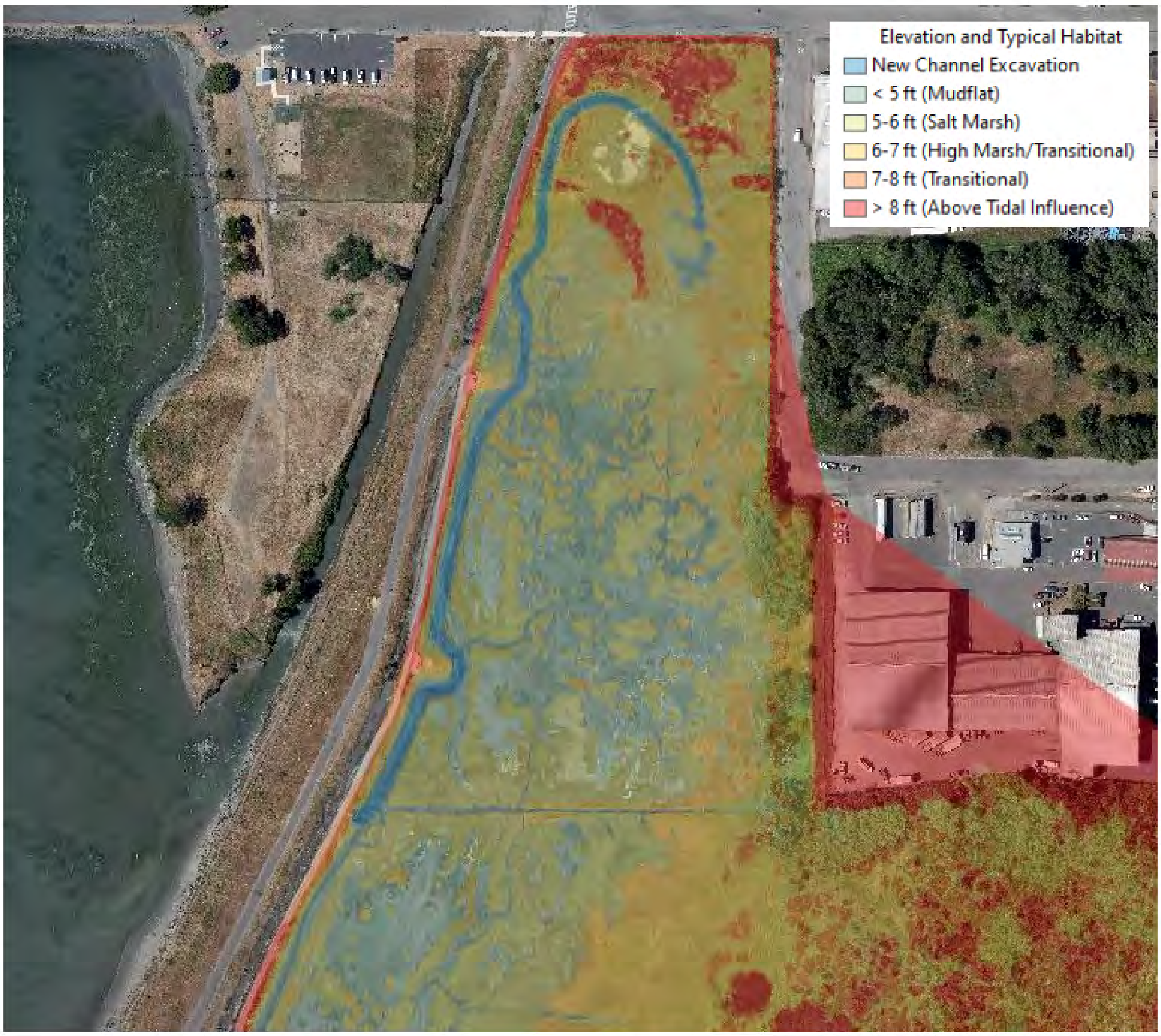

Figure 14 The Project will grade a tidal and stormwater channel to achieve lower elevations within Palco Marsh.

Tidal Pond

Based on discussions with USFWS, implementation of tidal pools in other projects on Humboldt Bay, such as the Elk River Restoration Project have demonstrated use by various species. A tidal pond is proposed at the flood tide terminus of the new tidal channel, where an existing low elevation area currently exists. However, iron and zinc presence in stormwater binds to sediment whereas nitrate is easily flushed from soils and clarification on the likelihood of contaminants setting in the tidal pond was requested by the State Coastal Conservancy. The tidal pond would be constructed with a sill at Mean Tide Level (MTL), resulting in tidal flow entering and flushing the pool twice daily (on each high and higher high tide). MTL at North Spit is elevation 3.36 feet (NAVD) for reference and would be slightly lower within Palco Marsh given the muting. The Del North Street outfall is located down-gradient of the tidal pool, between the pool and the Palco-Humboldt Bay crossing. If stormwater discharges at a low tide or ebb tide, stormwater would not go toward the pool, it would flow toward the crossing to Humboldt Bay. If stormwater discharges during a flood tide it will mix with tidal flow, dilute, enter the pool and then the tidal pool with be flushed by tides following the storm event. The mixing of stormwater with the tide will reduce the concentration of contaminants and the improved discharge of stormwater from the system was shown to reduce the overall residence time of stormwater in Palco Marsh. It does not appear that proposed conditions would result in increased contamination of the tidal pond areas given the improved evacuation of stormwater and twice daily flushing of the tidal pond and given existing stormwater migrates to the low area and does not currently have a defined path to be flushed from the location.

1.3.3 Stormwater Conveyance, Groundwater and Sea Level Rise

Channel Conveyance

The Project increases the capacity of the City's stormdrain system to the 10-year storm event within the Project Area. The 10-year storm event in combination with a high tide event was presented and discussed in Section 1.3.2 and showed that proposed conditions increase the peak water level in Palco Marsh, but reduce the duration of flooding (Figure 10). Removing the tidal influence from Humboldt Bay, proposed conditions reduce the peak water level and more efficiently discharge stormwater from Palco Marsh (Figure 15).

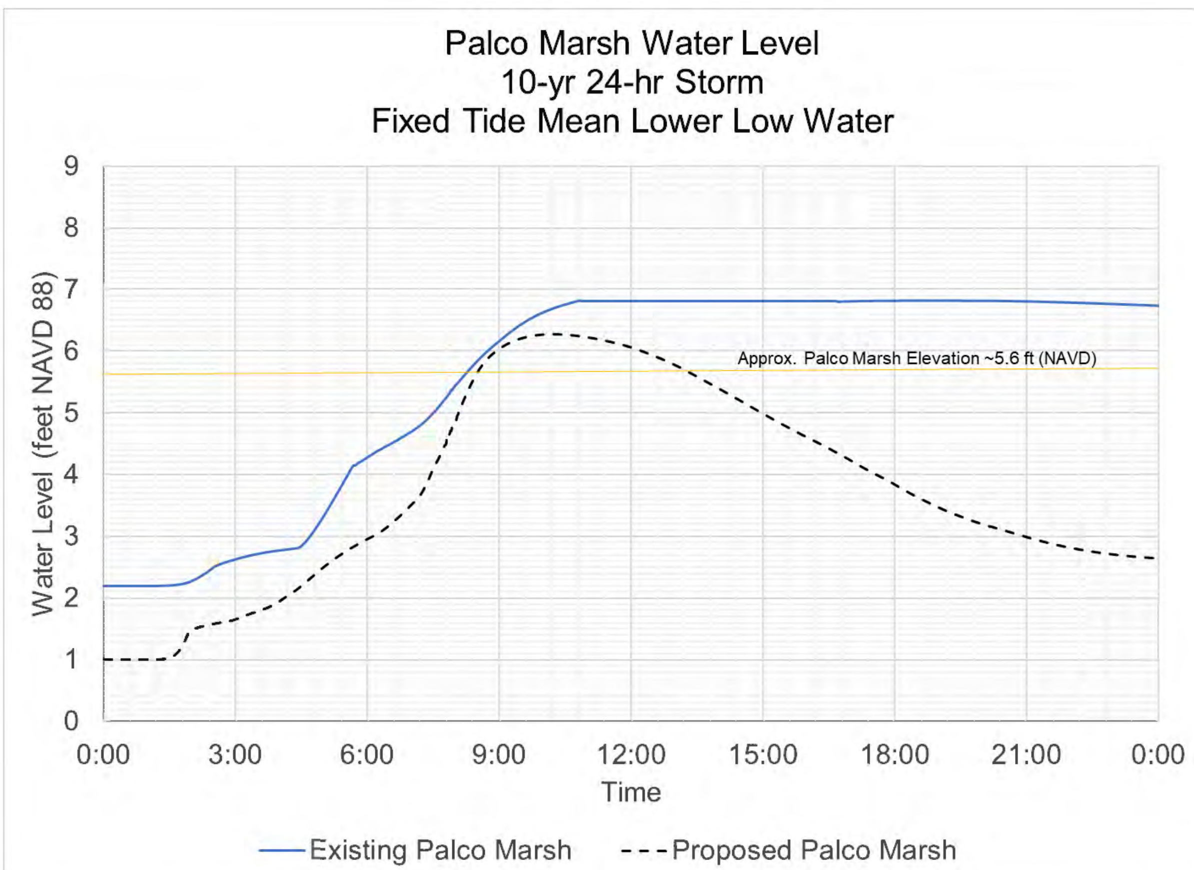

Figure 15 ***Without tidal influence, proposed conditions result in lower water levels and more efficient drainage within Palco Marsh.***

The proposed channel within Palco Marsh is based on overserved indicators of historical channel size, including top width and typical channel bottom elevations and side slopes. Historical indicators and typical slough channel characteristics suggest a bottom width of 10 feet, 2H:1V side slopes and slope of 0.2%. With this geometry the 10-year storm event, without any tidal waters present, would exhibit a flow depth of 3.3 feet, velocity of 3.8 ft/sec and shear stress of 0.67 lbs/ft^2. Typical channel geometry exhibits a minimum depth of 3.5 feet.

Groundwater

Groundwater in the vicinity of Palco Marsh was observed during geotechnical borings at an approximate elevation of 5 to 6 feet (SHN, 2022). Emergent groundwater with sea level rise could enter the stormdrain system if groundwater levels exceed roadway elevations. However, drain inlets throughout the lower elevations of the Project Area are typically between elevation 9 and 11 feet and the stormdrain system consists of closed conduits and no open channels. Therefore groundwater contributions under existing conditions and with up to 3 to 4 feet of sea level rise, assuming sea level rise and groundwater elevations increase equally, would not be anticipated to substantially increase stormwater flows compared to the modeled events, such as the 10-year storm.

Sea Level Rise

Figure 16 presents sea level rise projections for the Humboldt Bay North Spit as presented by the Ocean Protection Council (OPC, 2018) and Northern Hydrology & Engineering (NHE, 2015). The solid lines represent the projections of OPC (2018) and the dashed lines are the projections of NHE (2015). The solid red curve is referred to as the “H++” scenario and is considered a “stand alone” worst-case scenario of unknown probability of occurrence: The probability cannot be estimated with confidence because the process driving the rapid sea level rise (i.e., catastrophic collapse of land-based ice sheets into the ocean), is not well understood. The State recommends use of this curve for analyzing critical infrastructure and projects with high consequences to underestimating sea level rise.

The solid blue line represents the sea level rise projection represents a low likelihood of occurrence within the associated timeframe and provides a precautionary projection that should be used for less adaptive, vulnerable projects that will experience medium to high consequences as a result of underestimating sea level rise, such as a coastal housing development (OPC 2018). The probability of sea level rise exceeding the blue curve is 0.5%, or about 1 in 200 (OPC 2018). The solid green line represents the sea level rise projection that represents a “likely” range of sea level rise to occur within the associated timeframe with a probability of 66%, or about 1 in 1.5. The dashed blue, green and purple lines represent the projections by NHE (2015) associated with the high, mid-level, and low emissions scenarios, respectively. Note that the updated OPC (2018) guidance presents significantly higher amounts of sea level rise than shown by the NHE (2015) projections. However, since 2015, NHE has updated projections as described in the City of Arcata Sea Level Rise Risk Assessment (April 2018) and these curves are referred hereinafter as NHE (2019) and also shown on Figure 16. Overall, the NHE (2019) projections track closely to the projections for North Spit provided by OPC (2018).

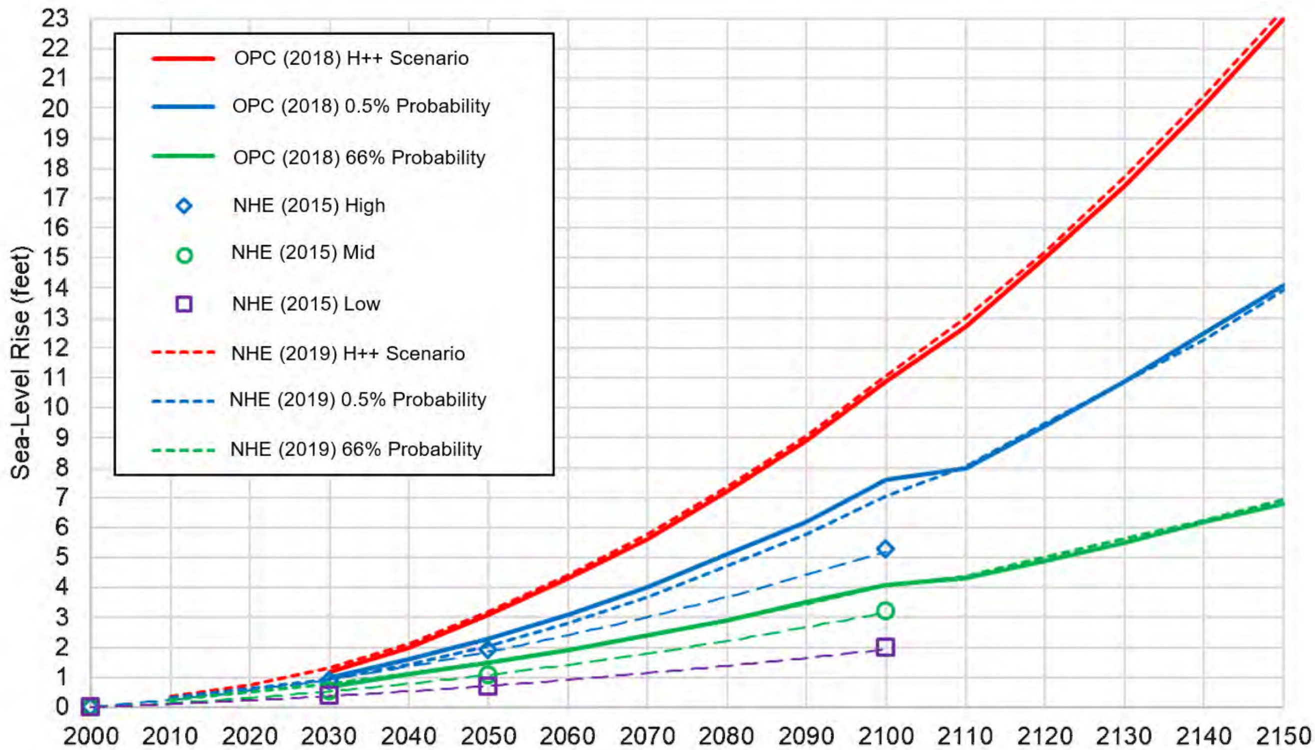

Figure 16 Sea level Rise Projections for North Spit, Humboldt Bay: OPC (2018) State Guidance (solid lines) and Regional Projections by NHE (2015) and NHE (2019)

Sea level rise will cause a vertical shift upward of the tidal range, resulting in higher low and high tides as well as groundwater. Based on modeled scenarios, the upward would increase the water levels within Palco Marsh for existing and proposed conditions. The peak water level elevation is highly dependent on the timing of the tidal condition (ebb tide, flood tide and peak tide) and the peak of the runoff hydrograph. In general, proposed conditions result in lower water levels in Palco Marsh if the storm event occurs during a lower elevation tides and slightly higher water levels if the event coincides with a higher high tide. Regardless of tidal water level, ebb or flood tide, the proposed project provides more effective drainage of stormwater from Palco Marsh. The increase in tidal exchange and circulation within Palco Marsh will improve sediment distribution into the marsh, thus improving potential for increasing rates of vertical accretion, thus slowing the effects of SLR on salt marsh vegetation.

2. Summary of Findings

The Project was first identified in the Eureka Area Watersheds Storm Water Resources Plan, which included a Technical Advisory Committee consisting of the City of Eureka, County of Humboldt, Humboldt Community Services District, and the North Coast Regional Water Quality Control Board. The Project was the highest scoring project based on the evaluation criteria.

Three alternatives were developed and assessed that focused on the stormwater discharge location. Utilizing the existing discharge location to Palco Marsh was selected as the least environmentally damaging practicable alternative given the other alternatives required new and continual disturbance within Humboldt Bay and greater potential impacts to listed species.

The implementation of the new stormdrain pipe along Del Norte Street will increase the contributing runoff area to Palco Marsh and reduces the runoff to the other locations that discharge directly to Humboldt Bay (14th Street, Koster/Washington Street, and Commercial Street). The increased discharge to Palco Marsh and

Project components within Palco Marsh were evaluated for water quality, environmental, and stormwater conveyance with consideration to groundwater and sea level rise. Findings are summarized below:

– **Water Quality**
  - Under proposed conditions, a relatively small increase in nitrate and reduction in zinc and copper occurs, with nearly complete discharge of stormwater within a single tidal cycle from Palco Marsh;
  - Under existing conditions stormwater is stored over multiple tidal cycles;
  - Proposed conditions reduces the contact time of stormwater with the marsh;
  - Proposed Project is not anticipated to diminish water quality and marsh habitat within Palco Marsh;

– **Environmental Benefits**
  - Removal of trash to all discharge locations within the Project Area;
  - Beneficial reuse of excavated soils for marsh creation in locations that have subsided and lost marsh;
  - Improved aquatic organism passage through the Palco Marsh to Humboldt Bay crossing by reducing peak velocities and increase the duration of acceptable fish passage velocities;
  - Increased tidal circulation with the excavation of a new channel to connect a low-elevation tidal pond to regular tidal flow within Palco Marsh;
  - Lowering of low tide to increase the tidal range and more closely match a natural tidal cycle in Palco Marsh;
  - Improved hydraulic control of water levels within Palco Marsh to manage for sea level rise within a subsided marsh area lacking sediment deposition sources;
  - Discontinuation of dredging practices within the Palco/Park channel.

– **Stormwater Conveyance, Groundwater and Sea Level Rise**
  - The channel geometry of proposed tidal channel in Palco Marsh can convey the 10-year storm event, without any tidal waters present and remain stable;
  - Groundwater contributions under existing conditions and with up to 3 to 4 feet of sea level rise, assuming sea level rise and groundwater elevations increase equally, would not be anticipated to substantially increase stormwater flows compared to the modeled events;
  - The proposed Project provides more effective drainage of stormwater from Palco Marsh regardless of sea level rise scenario.

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Attachment 6

Draft Soil and Groundwater Management

Eureka Flood Reduction and Sea Level Rise Resiliency

Draft Confirmation Sampling Report of Findings and Soil and Groundwater Management Plan

City of Eureka

22 September 2023

→ **The Power of Commitment**

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1. Introduction

The Eureka Flood Reduction and Sea Level Rise Resiliency Project (Project) is located in the City of Eureka (City), in Humboldt County California. The proposed Project is for utility infrastructure upgrades occurring within the City's utility rights-of-way and easements. A Caltrans Encroachment permit is being coordinated for the intersection of Del Norte and Broadway (HWY 101). The proposed Project is located within urbanized coastal areas to reduce flooding, increase sea level rise resiliency, and improve water quality in Humboldt Bay. The Project would increase the storage capacity and conveyance of the storm drain network, implement flow attenuation and water quality improvements, reduce trash conveyance into waterways, and enhance tidal circulation. Project locations are shown in Attachment 1, Figure 1 and Figure 2.

As part of planning for this Project, the COE has conducted environmental studies to evaluate potential sources of soil and groundwater contamination that could impact construction. This includes Phase I and Phase II Environmental Site Assessments (ESAs) conducted by SHN, and confirmation soil sampling conducted by GHD. These environmental studies are discussed in further detail below. The purpose of this report is to present the findings of the confirmation soil sampling as well as present a Soil and Groundwater Management Plan (SGMP) that will be used to safely handle, and transport, waste materials excavated during project construction and implementation.

1.1 Project Background

Many portions of the City's existing storm water system are old and undersized, resulting in significant flooding, which is being exacerbated by sea level rise. Although the impacts propagate to upstream portions of the system, the low-lying areas of the City experience the most flooding. Approximately one foot of flooding was witnessed on Washington Street during November 2012, when the area experienced high rainfall coinciding with high tides, which prevented the system from draining. Similar flooding was observed in January 2019. With the potential effects of rising sea levels and increased precipitation intensities, the City is susceptible to similar or more severe flooding at more frequent intervals.

The Eureka Flood Reduction and Sea Level Rise Resiliency Project (Project) addresses these issues by reducing peak flows, increasing the storm water system's storage and conveyance capacity, and managing flows through tide and flap gates. The Project would result in significant flood reduction and increased resilience to climate change. Peak flows for small storm events would be reduced by providing infiltration in rain gardens. Infiltration features are considered infeasible in many areas within the Project Area boundary due to high groundwater levels and poorly draining soils. Upsized and new storm mains will increase the system's storage and conveyance capacity resulting in significantly reduced flooding in the streets and buildings, thereby protecting human safety and reducing potential economic damage to the already disadvantaged community. Tide and flap gates would increase the City's resiliency by protecting the available storm water system's storage from being overwhelmed by tidal surges. Trash capture devices would be installed upstream of outfalls to Humboldt Bay to prevent discharge of trash.

1.2 Scope and Limitations

This report: has been prepared by GHD for City of Eureka and may only be used and relied on by City of Eureka for the purpose agreed between GHD and City of Eureka as set out in section 1 of this report.

GHD otherwise disclaims responsibility to any person other than City of Eureka arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

Accessibility of documents

If this report is required to be accessible in any other format, this can be provided by GHD upon request and at an additional cost if necessary.

2. Project Elements

The Project would increase the storage capacity and conveyance of the storm drain network, implement flow attenuation and water quality improvements, reduce trash conveyance into waterways, and enhance tidal circulation to provide flood reduction and sea level rise resiliency. Project Areas are shown in Attachment 1 on Figure 2.

Increased storage capacity and conveyance would be achieved by replacing undersized storm drainpipes with larger diameter pipes, installation of tide gates at strategic locations within the system, and construction of a new storm drain pipe alignment. Flow attenuation and water quality improvements would be accomplished with LID features (e.g., rain gardens) and trash capture devices. Rain gardens would be placed along or upstream of storm drain improvements, and trash capture devices would be installed in key locations along the storm drain alignments. Water quality benefits would be achieved by reducing peak flows and runoff volumes that can cause erosion and carry sediment to Humboldt Bay. The LID features would provide additional pollutant removal from urban runoff via the increased holding time, contact with vegetation, and percolation of runoff into soil. The trash capture devices (TCDs) would also reduce pollutants entering Humboldt Bay and assist the City in meeting their MS4 requirements.

Enhancements to the existing muted tidal system at Palco Marsh include channel excavation, placement of excavated soils to restore marsh plain elevations, and replacement of the existing hydraulic conveyance structure between the marsh and Humboldt Bay with larger capacity culverts and adjustable flap gates. The new culverts and channel would increase the lower tidal range, match existing tidal inundation duration, avoid offsite flooding, enhance sediment exchange from the Bay to Palco Marsh, reduce velocities within the crossing, and enhance sediment deposition on the marsh plain to promote adaptation of the marsh ecosystem to rising sea levels.

2.1 Project Areas and Engineering Design

Specifically, most Project components are located within various street segments and intersections throughout the City by Project region as shown in Attachment 1 on Figure 2. Note that Project Areas were selected for Phase II investigation were selected based on proximity to contaminated sites. Project Areas selected for Phase II investigation are shown in red on Figure 2 and in Table 1 below.

Stormwater Pipe Replacement

– Del Norte Street (St.) between B St. and the Eureka Waterfront Trail.
– Short St. between 15th St. and Wabash Ave.
– Koster St. between Washington St. and 4th St.
– Hawthorne St. between Union St. and California St.
– California St. between Hawthorne St. and Trinity St.
– Williams St. between Long St. and Buhne St.
– Long St. between Williams St. and D St.

Low Impact Development Installation

– Del Norte St. and California St.
– Sonoma St. and California St.

Trash Capture Device Installation

- Washington and Koster St.
- 14th St. and Eureka Waterfront Trail
- Commercial St. and Waterfront Dr.
- Del Norte St. at Palco Marsh

Tide Gate Installation

- Koster St. and Cedar St.
- Commercial St. and Waterfront Dr. (replacement/relocation of existing tide gate)
- Del Norte St. at Palco Marsh (replacement/relocation of existing tide gate)
- Palco Marsh at Humboldt Bay (adjustable to maintain existing tidal peak water levels)

Improvements to Palco Marsh

Improvements to Palco Marsh would occur in Palco Marsh located south of the western extent of Del Norte Street. The Project Area is bordered by residential, industrial, and open space uses. Portions of the Project Area are included in the mapped FEMA 100-year flood zone.

3. SHN Phase I and Phase II Summary

A Phase I Hazardous Materials Corridor Study was conducted by SHN in August of 2021 to identify locations of potential impacts to soil and groundwater within the Project Areas, based on nearby historical land uses (SHN 2021). The Phase I was used to identify Project Areas for further environmental investigation (Phase II environmental site assessment (ESA)).

The Phase I determined that not every Project Area needed further environmental investigation; therefore, SHN selected five locations for further investigation in Project Areas adjacent to sites that are known or suspected of having soil and groundwater contamination impacts. A Phase II ESA was conducted by SHN during the week of March 7, 2022, at the five selected locations (SHN 2022). Soil and groundwater sampling conducted as part of the Phase II ESA occurred simultaneously with the geotechnical investigation completed by SHN for the Project.

The five locations selected for Phase II investigation are presented in Table 1.

Table 1 Project Areas included in the SHN Phase II Investigation.

Boring Name	Location	Greater Project Segment	Project Element
B-01-22 & B-02-22	Intersection of Railroad Avenue and Del Norte St. And Palco Marsh	Del Norte Street (St.) between B St. and the Eureka Waterfront Trail And Palco Marsh	Stormwater Pipe Replacement, Trash Capture Device Installation and Tide Gate Installation And Palco Marsh Improvements
B-05-22	Intersection of W 14th St. and Railroad Avenue	14th St. and Eureka Waterfront Trail	Trash Capture Device Installation
B-07-22	Intersection of W Washington St and Koster St.	Washington and Koster St.	Trash Capture Device Installation
B-06-22	Commercial St. near Humboldt Bay	Commercial St. and Waterfront Dr.	Replacement of Existing Tide Gate and Trash Capture Device Installation

3.1 SHN Phase II Analytical Results Discussion

SHN completed eleven geotechnical borings (B-01 through B-11) at select locations across the Project Areas. Soil and groundwater samples were collected from five of the eleven geotechnical borings (B-01, B-02, B-05, B-06, and B-07) for submittal to a testing laboratory for analytical analysis. All five locations were analyzed for total petroleum hydrocarbons as motor oil, diesel, and gasoline (TPH MO/D/G) and volatile organic compounds (VOCs). In addition, Locations B-01 and B-02 were analyzed for pentachlorophenol (PCP), 2,3,4,6-tetrachloropheno (TCP), and dioxin and furans; location B-05 was analyzed for polycyclic aromatic hydrocarbons (PAHs); and location B-07 was analyzed for dioxins and furans, arsenic (As), and lead (Pb). The Phase II ESA Report does not provide a comparison of analytical results to regulatory screening levels.

GHD compared the analytical results from the SHN Phase II ESA to regulatory screening levels, including:

– San Francisco Regional Water Quality Control Board (SFRWQCB) Environmental Screening Levels (ESLs).

– Department of Toxic Substance Control (DTSC) Human Health Risk Assessment (HHRA) Note Number 2 for Soil Remedial Goals for Dioxin and Dioxin-like Compounds. Note: The DTSC Regional Screening Level (RSL) for Dioxin compounds is based on the US EPA RSL.

Analytical results from the SHN Phase II ESA and comparison to screening levels are summarized in Table 2, Table 3, and Table 4 below.

Table 2 SHN Phase II Soil Analytical Results Compared to Regulatory Screening Levels. Data Reported in mg/kg[a] Unless Otherwise Noted.

Sample Location & Depth (feet BGS) [b]	TPHMO[c]	TPHD[c]	TPHG[c]	VOCs[d]	PCP[e]	TCP[e]	WHO TEQ[f] (pg/g) [g]	Arsenic	Lead
DTSC HHRA Note 2 and US EPA RSL	--	--	--	--	--	--	**5**	--	--
USGS Average Background Metal Concentration Humboldt County	--	--	--	--	--	--	--	**6.8**	**12.8**
SFRWQCB Tier 1 ESL	**1,600**	**260**	**100**	**Varies; TCE = 0.085**	**0.013**	--	--	**0.067**	**32**
SFRWQCB Construction Worker – Non-cancer Hazard	**54,000**	**1,100**	**1,800**	**Varies; TCE = 18**	**560**	--	--	**0.98**	**160**
SFRWQCB Terrestrial Habitat - Parkland	**1,600**	**260**	**120**	**Varies; TCE = 8.1**	**0.013**	--	--	**25**	**32**
SFRWQCB Terrestrial Habitat – Commercial/Industrial Areas	**1,600**	**260**	**120**	**Varies; TCE = 250**	**39**	--	--	**50**	**32**
B-01-22 (4-5’)	17	<1.0[h]	<1.3	ND[i]	<1.0	<1.0	3.52 J[j]	NA[k]	NA
B-01-22 (9-10’)	<10	<1.0	<1.5	ND	<1.0	<1.0	0.0518 J	NA	NA
B-02-22 (4-5’)	45	9.3[l]	<1.3	ND	<1.0	<1.0	2.57 J	NA	NA
B-02-22 (9-10’)	24	6.5[m]	<1.6	ND	<1.0	<1.0	2.92 J	NA	NA
B-05-22 (2-4’)	98	10[m]	<1.0	ND	NA	NA	NA	NA	NA
B-05-22 (9-10’)	<10	<1.0	<1.4	ND	NA	NA	NA	NA	NA
B-06A-22 (4-5’)	55	15[n]	<1.2	ND	NA	NA	NA	NA	NA
B-06B-22 (8.5-10’)	<10	2.0	<1.4	ND	NA	NA	NA	NA	NA

Sample Location & Depth (feet BGS) [b]	TPHMO[c]	TPHD[c]	TPHG[c]	VOCs[d]	PCP[e]	TCP[e]	WHO TEQ[f] (pg/g) [g]	Arsenic	Lead
B-07-22 (4-5’)	530	46[l]	<1.0	ND	NA	NA	0.0585 J	3.9	11
B-07-22 (9-10’)	45	2.7[l]	<1.4	ND	NA	NA	0.782 J	5.6	15
B-07-22 (13.5-14.5’)	12	1.6	<1.3	ND except TCE[o]=0.032	NA	NA	0.130 J	4.6	5.1

a. mg/kg: milligrams per kilograms
b. BGS: below ground surface
c. TPH: total petroleum hydrocarbons as motor oil (MO), diesel (D), and gasoline (G)
d. VOCs: volatile organic compounds; see laboratory analytical report for list of constituents
e. PCP: pentachlorophenol/TCP: 2,3,4,6-tetrachlorophenol
f. WHO TEQ: 2005 World Health Organization Toxic Equivalent
g. pg/g: picograms per gram
h. <: “less than” the stated laboratory reporting limit
i. ND: not detected
j. J:TEQs calculated from one or more values flagged–analyte concentration is below calibration range
k. NA: not analyzed
l. The sample does not have the typical pattern of fresh diesel. The material is the lighter portion of the material in the motor oil range.
m. The sample contains material in the diesel range of molecular weights, but the material does not exhibit the peak pattern typical of diesel oil.
n. The sample contains material similar to degraded or weathered diesel oil.
o. TCE: trichloroethene

As shown in Table 2, there were no detections of TPHMO, TPHD, TPHG, VOCs, PCP, TCP, Dioxins/Furans, or lead that exceed Tier 1 ESLs in soil samples collected from the Project Areas.

Arsenic concentrations at B-07-22 exceed the Tier 1 and Construction Worker ESLs, however concentrations are below the published USGS average background concentration for arsenic in soil in Humboldt County (USGS 2023). Arsenic concentrations at B-07-22 are also below the Terrestrial Habitat Parkland and Terrestrial Habitat Commercial/Industrial ESLs.

Table 3 *SHN Phase II Soil Analytical Results - PAHs[a] Compared to Agency Screening Levels. Data Reported in mg/kg[b] Unless Otherwise Noted. Note that in the SHN Phase II Report these Data are Reported in Microgram per Kilogram (ug/kg), however they have been Converted to Milligram per Kilogram (mg/kg) so they can be Compared to ESLs.*

Constituent	Sample Location and Depth (feet BGS)[c]		Screening Levels (mg/kg)			
	B-05-22 (2-4')	B-05-22 (9-10')	SFRWQCB Tier 1 ESL	SFRWQCB Construction Worker (non-cancer hazard)	SFRWQCB Terrestrial Habitat - Parkland	SFRWQCB Terrestrial Habitat – Commercial/Industrial Areas
1-Methylnaphthalene	<0.01[d]	0.0022	--	--	--	--
2-Methylnaphthalene	0.011	0.0032	0.88	--	--	--
Acenaphthene	0.025	0.0044	12	--	--	--
Acenaphthylene	0.035	<0.001	6.4	--	--	--
Anthracene	0.046	<0.001	1.9	--	--	--
Benzo(a)anthracene	0.24[e]	0.0011	0.63	--	--	--
Benzo(a)pyrene	0.54[e]	0.0026	**0.11**	**10**	**25**	**90**
Benzo(b)fluoranthene	0.62[e]	0.0041	1.1	--	--	--
Benzo(g,h,i)perylene	0.13[e]	<0.001	2.5	--	--	--
Benzo(k)fluoranthene	0.21[e]	<0.001	2.8	--	--	--
Chrysene	0.29[e]	0.002	2.2	--	--	--
Dibenzo(a,h)anthracene	<0.02[e]	<0.001	0.11	--	--	--
Fluoranthene	0.85[e]	0.0029	**0.69**	**6,700**	**0.69**	**120,000**
Fluorene	0.012	<0.001	6.0	--	--	--
Indeno(1,2,3-cd) pyrene	0.14[e]	0.0018	0.48	--	--	--
Naphthalene	0.042	0.0017	**0.042**	**500**	**0.75**	**28**
Phenanthrene	0.45[e]	0.0045	7.8	--	--	--
Pyrene	0.92[e]	0.0034	45	--	--	--

a. PAHs: polycyclic aromatic hydrocarbons
b. mg/kg: milligram per kilogram
c. BGS: below ground surface
d. <: "less than" the stated laboratory reporting limit
e. Sample required a dilution due to the high concentration of a target analyte

As shown in Table 3, Benzo(a)pyrene and Fluoranthene were detected slightly above Tier 1 ESLs in soil collected from B-05-22. However, these detections are below the Construction Worker Non-cancer Hazard ESL and below the Terrestrial Habitat ESLs. Naphthalene was detected at the Tier 1 ESL and is below the other ESLs.

Table 4 SHN Phase II Analytical Results Compared to Agency Screening Levels for Groundwater Samples (in ug/L[a] Unless Otherwise Noted). Only the Tier 1 ESL is Provided if the Constituent was not Detected in the Sample.

Sample Location	TPHMO[b]	TPHD[b]	TPHG[b]	VOCs[c]	PCP[d]	TCP[d]	WHO TEQ[e] (pg/L)[f]	Dissolved Arsenic	Dissolved Lead	PAHs[g]
SFRWQCB Tier 1 ESL	**1,600**	**100**	**100**	**MTBE = 5.0**	1.0	--	***	**10**	**2.5**	**Varies**
SFRWQCB Tapwater Cancer Risk	--	--	--	**MTBE=13**	--	--	--	**0.004**	--	--
SFRWQCB Freshwater Ecotox	--	--	--	**66,000**	--	--	--	**150**	--	--
SFRWQCB Saltwater Ecotox	--	--	--	**8,000**	--	--	--	**36**	--	--
B-01-22	<170[h]	<50	<50	ND[i]	<0.30	<1.0	3.39 J[j]	NA[k]	NA	NA
B-02-22	<170	<50	<50	ND	<0.30	<1.0	2.92 J	NA	NA	NA
B-05-22	<170	<50	<50	MTBE[l]=0.68	NA	NA	NA	NA	NA	ND
B-06-22	<170	50	<50	MTBE=11; TAME[m]=0.62	NA	NA	NA	NA	NA	NA
B-07-22	<170	<50	<50	ND	NA	NA	0.00233 J	18	<5.0	NA

a. µg/L: micrograms per liter
b. TPH: total petroleum hydrocarbons as motor oil (MO), diesel (D), and gasoline (G)
c. VOCs: volatile organic compounds; see laboratory analytical report for list of constituents
d. PCP/TCP: pentachlorophenol/2,3,4,6-tetrachlorophenol
e. WHO TEQ: 2005 World Health Organization Toxic Equivalent
f. pg/L: picogram per liter
g. PAHs: polycyclic aromatic hydrocarbons; see laboratory analytical report for list of constituents
h. <: "less than" the stated laboratory reporting limit
i. ND: not detected
j. J: TEQ's calculated from one or more values flagged–analyte concentration is below calibration range
k. NA: not analyzed
l. MTBE: methyl tert-butyl ether
m. TAME: tert-amyl methyl ether

***. SFRWQCB only provides ESLs for the dioxin compound 2,3,7,8-TCDD, which was non-detect or was detected below the analytical instrument calibration range.

As shown in Table 4, there were no detections above the Tier 1 ESL for TPHMO, TPHD, TPHG, PCP, TCP, dissolved lead, or PAHs in groundwater samples collected from the Project Areas.

MTBE was detected above the Tier 1 ESL in groundwater collected from B-06-22, however the concentration is below the Tapwater Cancer Risk, Freshwater Ecotox, and Saltwater Ecotox ESLs.

Dissolved Arsenic was detected above the Tier 1 ESL in groundwater collected from B-07-22, however the concentration is below the Freshwater and Saltwater Ecotox ESLs.

WHO TEQ values for dioxins and furans indicate there were low detections in groundwater collected from B-01-22, B-02-22, and B-07-22. However, these WHO TEQ values were calculated using analyte concentrations that are “J” flagged by the analytical laboratory. J-flags indicate that the concentration detected is below the instrument calibration range and therefore must be considered approximate values.

4. Phase II Analytical Results Discussion

As presented above in Table 2 through Table 4 and in the discussions following each table, there were few detections that exceeded Tier 1 ESLs and no detections that exceeded the Terrestrial Habitat Commercial/Industrial, Freshwater Ecotox, or Saltwater Ecotox ESLs.

Recommendations from the Phase II ESA include treating soil within 200 feet of the five locations that were sampled as being contaminated. The recommendations suggest isolating and stockpiling soil that is excavated from within 200 feet of each of the five locations. An explanation is not provided for how the 200 ft buffer was determined.

There are two Project locations where relatively large volumes of soil will need to be excavated or otherwise handled during project implementation. These locations include the storm drain replacement along W Del Norte Street and the improvements to Palco Marsh. If the 200 ft buffer is applied to the Phase II sampling locations (B-01-22 and B-02-22) the estimated volume of soil along west Del Norte Street that would need to be stockpiled is approximately 920 cubic yards. The estimated volume of soil that would need to be stockpiled from the Palco Marsh Improvements is approximately 3,700 cubic yards. For perspective, the average dump truck has a capacity of 10-12 cubic yards.

Stockpiling this volume of soil, awaiting additional analytical analysis, and potentially having to dispose and ship this volume of soil is a primary concern for implementation of the Project. The concern is due to the lack of a large area to manage stockpiles of this size as well as the cost for the potential need to excavate, load, transport, stockpile, load, then transport and dispose of the soil at a licensed facility (which would need to be out of the North Coast Region). The trucking and disposal costs alone could result in the Project becoming infeasible.

Due to these primary concerns, confirmation soil sampling was conducted at specific locations along west Del Norte Street and in Palco Marsh to potentially reduce the area of concern (200 ft buffer) that was recommended in the Phase II ESA. The confirmation sampling procedures and results are discussed below.

5. Confirmation Soil Sampling

Confirmation soil sampling was conducted at select locations to potentially reduce the area of concern (200 ft) recommended in the Phase II ESA conducted by SHN. The first purpose of confirmation sampling is to potentially reduce the volume of material that needs to be stockpiled during construction. The second purpose is to determine the volume of soil that would potentially need to go to a licensed disposal facility and to inform the Project of costs associated with transport and disposal.

The locations for confirmation soil sampling were selected based on Phase II analytical results and Project Areas where large volumes of soil materials will need to be handled as part of Project implementation. The sample locations and analytical analyses are discussed below.

5.1 Sample Locations and Analytical Analysis

Seven locations were selected for confirmation soil sampling, five of the locations are within the west Del Norte Street and Palco Marsh Project Areas, as discussed above. In addition, two locations were selected at the Washington and Koster Streets intersection (Phase II boring B-07-22) for confirmation metals sampling. A summary of the select locations is as follows:

– Three locations along west Del Norte Street near the Intersection with the Eureka Waterfront Trail
– Two locations in the Palco Marsh Improvement Area
– Two locations in the Project Area near the intersection of Washington and Koster Streets.

The two locations planned for the Project Area near the intersection of Washington and Koster Streets could not be sampled due to several reasons. A site meeting with the City of Eureka held on June 27, 2023, determined that a water mainline, and an electrical line, are located within the Project Area that was planned to be sampled. The City of Eureka's right-of-way at the Project Area is relatively narrow and clearance from the utilities could not be achieved. In addition, the Project Area has thick riprap along the existing storm drain channel and is paved in some areas, further restricting available space for soil sampling. For these reasons the two confirmation sample locations at the Washington and Koster Project Area were not collected.

Three locations along west Del Norte Street were sampled. Soil samples were collected from 3 depth intervals in each of the three borings: 1-1.5 ft, 2.5-3 ft, and 5.0-5.5 ft. The deepest interval was selected based on the proposed depth of excavation. The soil was later composited by North Coast Laboratories prior to analytical testing.

The samples were composited by depth interval across the three borings. Soil was composited this way such that potential contamination would be isolated by depth across the length of the area. Isolating by depth across the length of the area would allow for further reduction of the volume of soil that could potentially need to be handled as a hazardous material. An example of how the samples were composited is shown in the schematic below.

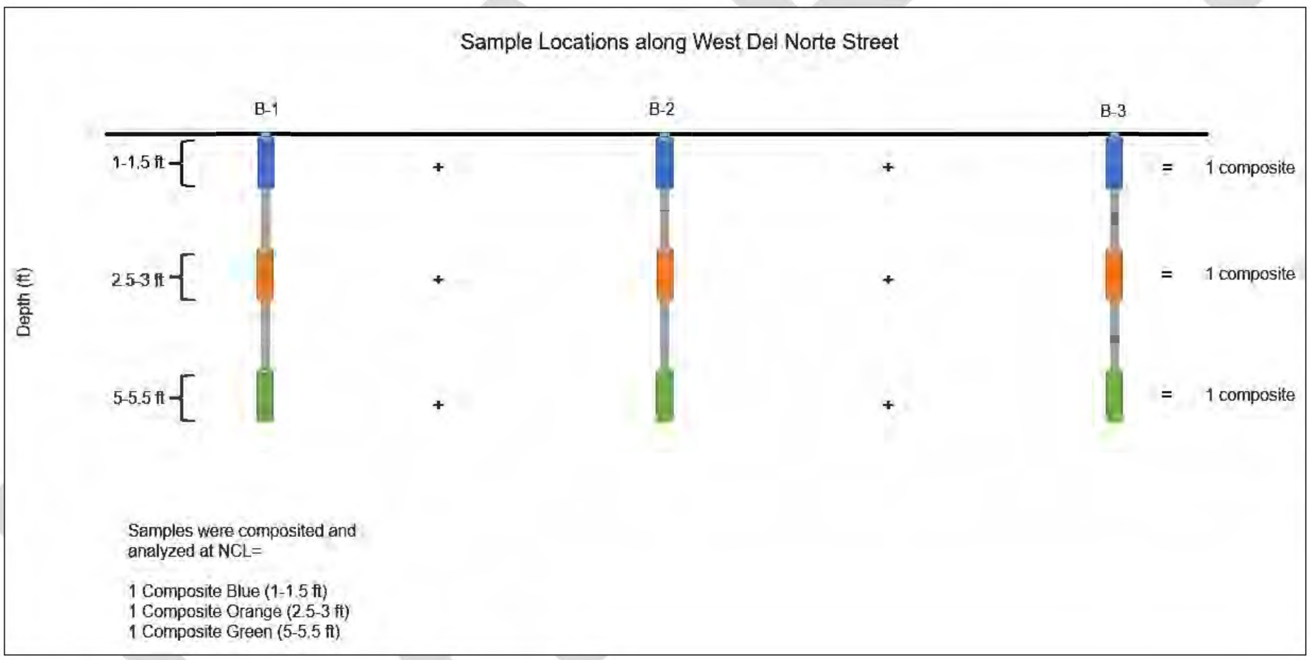


Diagram 1 ***Schematic showing soil sampling compositing by depth across the length of west Del Norte Street.***

Two locations within Palco Marsh were sampled. Similar to the locations along west Del Norte Street, the soil samples were collected from three depth intervals and later composited by NCL prior to analytical testing and the composites were made based on depth interval from both borings.

The analytical suite was chosen for waste stream characterization. Landfills require specific analysis to be completed prior to accepting waste. The constituents chosen were selected so that if disposal at a landfill were necessary, the required tests would be accounted for. Dioxins and furans were not included in the analytical suite based on the findings of the Phase II report as well as the direction of groundwater flow in relation to these sample locations.

Table 5 describes the analytical suite and compositing.

Table 5 Confirmation Soil Sampling Locations and Analytical Analysis.

Boring	Location	Samples Analyzed	Analytical Suite
B-1, B-2, B-3	West Del Norte Street	1 composite 0.5-1 ft	TPHD, TPHMO, TPHG, VOCs, Lead
		1 composite 2.5-3 ft	
		1 composite 5-5.5 ft	
B-4 & B-5	Palco Marsh	1 composite 0.5-1 ft	TPHD, TPHMO, TPHG, VOCs
		1 composite 2.5-3 ft	
		1 composite 5-5.5 ft	

5.2 Sampling Procedures

GHD obtained a soil boring permit from the Humboldt County Department of Environmental Health prior to conducting the sampling. GHD also notified Underground Services Alert (USA) and conducted site visits with utility staff to discuss locations of utilities.

The City of Eureka provided a backhoe, asphalt saw, and City staff that removed the pavement at sample locations along west Del Norte Street. GHD sampled soil through the hole using a hand auger. Soil collected in Palco Marsh was also collected using a hand auger.

Equipment was cleaned using liquinox soap and distilled water between each sampling interval and each boring location. Nitrile gloves were worn for GHD worker protection as well as to prevent sample contamination. Samples were collected in laboratory provided glass jars. Following sample collection soil borings were filled with bentonite chips and hydrated with potable water. The City of Eureka patched the pavement.

5.3 Analytical Laboratory

Analytical analysis was performed by North Coast Laboratories, a State-certified analytical laboratory in Arcata, CA. NCL performed compositing of the soil samples prior to conducting the analysis.

5.4 Investigation Derived Waste

Soil waste was contained in 5-gallon buckets with lids, labeled with date, material, and purpose, and then dropped off at the City Maintenance Yard for storage, pending the analytical results. No groundwater was extracted from the borings during soil sampling; therefore, no groundwater waste was stored as part of the investigation.

6. Soil Sampling Analytical Results

Soil sampling analytical results in comparison to the Tier 1 ESLs are presented in Table 6. Only Tier 1 ESLs are presented, as they are conservative and there were no exceedances.

Table 6 Confirmation Soil Sampling Analytical Results Compared to Tier 1 ESLs (mg/kg[a]).

Composite		Lead	VOCs	TPHD	TPHMO	TPHG
SFRWQCB Tier 1 ESL		**32**	**Varies**	**260**	**1,600**	**100**
B-1, B-2, B-3	1-1.5 ft	5.4	ND[b]	1.5	18	<1.2[c]
B-1, B-2, B-3	2.5-3 ft	3.6	ND	<1.0	<10	<1.2
B-1, B-2, B-3	5-5.5 ft	<1.0	ND	<1.0	<10	<1.3
B-4 & B-5	1-1.5 ft	--[d]	ND	1.6	10	<1.7
B-4 & B-5	2.5-3 ft	--	ND	1.1	<10	<1.6
B-4 & B-5	5-5.5 ft	--	ND	<1.0	<10	<1.5

a: Milligram per kilogram
b: ND – Not detected
c: < - Less than the stated laboratory reporting limit
d: -- Not analyzed

7. Proposed Soil and Groundwater Reuse

Based on the comparison of regulatory screening levels to the Phase II ESA and confirmation soil sampling analytical results, the following sections describe proposed soil and groundwater handling at the respective Project Areas.

7.1 Proposed Soil Handling and Reuse

7.1.1 West Del Norte Street and Palco Marsh

The analytical results of the confirmation soil sampling indicate that the Phase II ESA recommendation that a 200 ft buffer be applied around Phase II ESA sample locations is overly conservative at the west Del Norte Street and Palco Marsh Project Areas. It is estimated that approximately 920 cubic yards will be excavated along west Del Norte Street and 3,700 cubic yards will be excavated from Palco Marsh.

There are no exceedances above ESLs at SHN borings B-01-22 and B-02-22 and there are no exceedances above ESLs at GHD borings B-1, B-2, B-3, B-4, or B-5.

As discussed previously, the low detections of dioxins and furans are “J”-flagged by the analytical laboratory indicating that the detections are below the calibration range (i.e., quality assurance level) of the instrument. Therefore, these detections are estimated values. Regardless, the detections are below the EPA RSL of 5 pg/g.

Based on these results, it is proposed that soil excavated along west Del Norte Street be approved for unrestricted reuse. This may include reuse within Project Areas or release to the contractor for unrestricted reuse elsewhere on unrelated projects. The area of excavation that this applies to is shown in Attachment 1 on Figure 3.

It is also proposed that soil excavated within Palco Marsh as part of intertidal channel improvements be approved for unrestricted reuse. This soil would be reused within Palco Marsh to increase elevations in specific areas to restore marsh elevations as a buffer for sea level rise (SLR). The area of excavation that this applies to is shown in Attachment 1 on Figure 3.

7.1.2 Intersection of Washington and Koster Streets

Confirmation soil sampling was not able to be completed at Koster and Washington Streets intersection due to utility and riprap conflicts. There are no detections in soil collected from the Phase II ESA soil boring B-07-22 that exceed ESLs, except for arsenic. Arsenic was detected at concentrations that exceed Tier 1 ESL, but do not exceed the

Terrestrial Habitat – Parkland or the Terrestrial Habitat – Commercial/Industrial Areas. The detections are also below the USGS published average background concentration of arsenic in Humboldt County soil.

The proposed Project element at this location is installation of a trash capture device. This will require limited excavation and installation of a concrete headwall and apron. The existing channel is heavily rip-rapped with large diameter (~2 ft) rock. The rip rap will need to be removed and it is estimated that approximately 30 yards of soil may need to be excavated.

Based on the Phase II analytical data comparison to Terrestrial Habitat ESLs and the USGS average background arsenic concentration, it is proposed that this soil be approved for reuse in a commercial/industrial setting. This may include release of the soil to a contractor for reuse at unrelated commercial/industrial projects. The area of excavation that this applies to is shown in Attachment 1 on Figure 5.

7.1.3 West 14th Street and Eureka Waterfront Trail

The proposed Project element at this location is installation of a trash capture device. Approximately 30 cubic yards of excavation is estimated at this location. Confirmation sampling did not occur at this location based on the results of the Phase II and because of the minimal volume of soil estimated to be excavated at this location. As part of the Phase II ESA, there were no detections of VOCs or TPHG and no detections above ESLs for TPHMO and TPHD. PAHs were analyzed for B-05-22. Benzo(a)pyrene was measured above the Tier 1 ESL but below the Terrestrial Habitat – Parkland and Terrestrial Habitat – Commercial/Industrial ESLs. Fluoranthene was measured above the Tier 1 and Parkland ESLs, but below the Terrestrial Habitat – Commercial/Industrial ESLs. PAHs were not detected in groundwater at this location.

Based on the Phase II analytical data compared to the Terrestrial Habitat ESLs, it is proposed that soil excavated from this Project Area be approved for reuse in a commercial/Industrial setting. This may include release of the soil to a contractor for reuse at unrelated commercial/industrial projects. The area of excavation that this applies to is shown in Attachment 1 on Figure 4.

7.1.4 Commercial Street and Waterfront Drive

The proposed Project element at this location is replacement/relocation of an existing tide gate and installation of a trash capture device. Approximately 40 cubic yards of excavation is estimated at this location. Confirmation sampling did not occur at this location based on results of the Phase II analysis. This location included the Phase II ESA boring B-06-22. Soil at this location was analyzed for TPHMO, TPHD, and TPHG. There are no detections above ESLs.

Based on the Phase II ESA analytical results compared to ESLs, it is proposed that soil excavated from this Project Area be approved for unrestricted reuse. This may include reuse within Project Areas or release to the contractor for unrestricted reuse elsewhere on unrelated projects. The area of excavation that this applies to is shown in Attachment 1 on Figure 6.

7.2 Proposed Groundwater Handling

Groundwater was sampled at five locations during the Phase II ESA conducted by SHN. There are no detections of TPHMO, TPHD, TPHG, PCP, TCP, or PAHs. There are also no detections that exceed the Freshwater or Saltwater Ecotox ESLs. There are two detections (one of MTBE and one of Arsenic) that exceed Tier 1 ESLs, which are discussed below.

As discussed previously, the low detections of dioxins and furans are "J"-flagged by the analytical laboratory indicating that the detections are below the calibration range (i.e., quality assurance level) of the instrument. Therefore, these detections are estimated values. Detections of dioxins and furans in soil collected from the same borings are below the EPA RSL of 5 pg/g. The dioxin compound 2,3,7,8-TCDD was non-detect or was detected below the instrument calibration range.

It is expected that excavations will encounter shallow groundwater in most Project Areas, including those outside of the locations included in the Phase II investigation. Temporary groundwater dewatering would involve pumping water out of a trench or excavation. Turbid groundwater would typically be pumped to a settling pond, Baker tanks (or other similar type of settling tank), or into a dewatering bag prior to discharge. Turbid discharge to regulated waters would not occur; it would be pumped to an upland area for infiltration or the sanitary sewer system.

Proposed groundwater handling for the Project Areas included in the Phase II investigation is described below.

7.2.1 Project Areas at Commercial Street and Waterfront Drive, Koster and Washington Streets, and 14th Street and Railroad Avenue

One detection of MTBE in groundwater at B-06-22 (Commercial and Waterfront Drive) exceeds the Tier 1 ESL. The detection at B-06-22 is below the Tapwater Cancer Risk, Freshwater Ecotox, and Saltwater Ecotox ESLs. A low detection of Tert-amyl methyl ether (TAME) also occurred in B-06-22; however, this is not a constituent included in the SFRWQCB ESLs, so no comparison is presented.

Dissolved arsenic was measured slightly above the Tier 1 ESL at B-07-22 (Koster and Washington Streets); however, the concentration is below the Freshwater and Saltwater Ecotox ESLs. Arsenic detected in soil collected from the same boring also exceeds the Tier 1 ESL but is lower than the published USGS average background concentrations of Arsenic in Humboldt County soil. The USGS does not publish background concentrations of metals in groundwater.

Groundwater collected during project excavation at these locations will be discharged to the City of Eureka sanitary sewer system where it will be processed at the Wastewater Treatment Plant.

There were no detections above regulatory ESLs in groundwater at B-05-22. However, this site is adjacent to several sites currently under regulatory monitoring. Therefore, in an effort to be conservative, groundwater from this location will also be discharged to the City's sanitary sewer system.

7.2.2 Project Areas at West Del Norte Street and Palco Marsh

Groundwater collected during project excavation at these locations will either be passed through a settling tank or filter bag to remove turbidity or discharged to a vegetated upland area or to the City of Eureka sanitary sewer system.

7.2.3 Additional Considerations for Palco Marsh

Temporary dewatering will occur to accommodate work at Palco Marsh (and other areas outside of the Phase II investigation areas discussed herein). Dewatering would occur in tandem with the low tide, (i.e., the construction work area would be isolated during low tide which may preclude or significantly reduce the need to use pumps or other methods of dewatering except to dewater small, shallow, isolated areas). Although it is unlikely that aquatic species would be within Palco Marsh, Clark Slough or the tidal inlet, the isolated pools of water would be surveyed to determine whether aquatic species are present, and if so, they would be relocated into suitable habitat (within Humboldt Bay). The tidal inlet into Palco Marsh would be blocked at low tide with cofferdam(s) to prevent tidal water from entering Palco Marsh during construction within this area.

8. Soil and Groundwater Management

8.1 Key Project Personnel

Key Project Personnel are included in Table 7.

Table 7 *Key Project Personnel*

Name	Affiliation	Role	Contact Phone Number	Contact Email
Brett Vivyan	GHD	Construction Manger	707-267-2275	Brett.Vivyan@ghd.com
Mindi Curran	GHD	Geologist	707-267-2284	Mindi.Curran@ghd.com
TBD	Contractor	Superintendent	TBD	TBD

8.2 Plan Implementation

The City, as the project lead, is responsible for appropriate implementation of the SGMP during construction activities that may encounter impacted soil and/or groundwater in the Project Areas. This SGMP must be reviewed and acknowledged by the City's project manager, construction manager (GHD) and the contractor's superintendent and foremen, and this review and acknowledgment must be appropriately documented. An example SGMP Review, and Acknowledgment Form is provided in Attachment 2 for reference and use. All other parties involved in construction activities at the Site shall comply with appropriate notification and profiling requirements outlined herein, and regular meetings shall be conducted to discuss and enforce this SGMP during construction activities. This SGMP is primarily focused on Project Areas that were included in the Phase II environmental investigation. It should be used in conjunction with the Project specific SWPPP.

8.3 Worker Training and Protection

Due to potential contractor contact with unexpected, contaminated soil and/or groundwater, at least one construction personnel per working shift are to be 40-hour Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations & Emergency Response (HAZWOPER) trained in accordance with 29 CFR 1910.120. The contractor shall confirm current training certifications of onsite personnel, including current annual 8-hour HAZWOPER refresher training. The contractor is responsible for producing a designated site Health and Safety Plan (HASP) prior to initiating work that appropriately addresses site hazards, worker protection, environmental health and public safety.

The contractor is additionally responsible for worker safety when/if impacted material is encountered; workers shall wear appropriate level personal protective equipment (PPE) including, but not limited to gloves, safety glasses or goggles, hard hats and reflective clothing that provide adequate worker protection. The level of PPE and responsible requirements shall be stipulated in the designated Site HASP. All work conducted in the subsequent segments shall be conducted in accordance with site-specific specifications that govern and appropriately manage project construction activities.

Note, a respiratory protection plan is not a component of this SGMP and may be required dependent on unknown site conditions encountered during construction. If conditions differ from expected, or change during construction activities, it is the responsibility of the contractor to perform Stop Work pending an appropriate upgrade in the level of PPE in accordance with the site-specific HASP to ensure adequate and appropriate protection of their employees, the environment, and the general public.

9. Waste Management

Project construction requires excavation, filling, stockpiling and waste transportation. The City shall require employees and contractors performing work to comply with this SGMP as work duties may encounter unexpected, contaminated soil and/or groundwater. All excavation activities shall also be completed in accordance with the Site-specific HASP. The following sections address specific stockpiling, handling and management requirements associated with potentially impacted soil and groundwater. An example field form for assessing soil and groundwater is provided in Attachment 3 Field Forms.

9.1 Soil

It is recommended that when excavation is occurring within the Project Areas included as part of the Phase II ESA air quality and soil be monitored using a photo ionization detector (PID). Monitoring with the PID should take place at regular time intervals during excavation activities and should be recorded on a monitoring log. Freshly excavated soil should be containerized in a sealable bag and PID measurements taken prior to the soil being transported for reuse within the Project, release to a contractor, or transport to the designated stockpiling area. In addition to regular PID readings, workers should be trained to identify potentially contaminated materials via visual observation and olfactory observations.

All Site workers are responsible for notifying the City's construction manager if any potential impacted soil and/or groundwater is believed encountered. If potentially impacted soil and/or groundwater is encountered, qualified personnel shall screen for the presence of organic vapors using a PID or by applying general screening procedures.

Once notified, the City's construction manager or designee shall visually inspect the suspected contamination and will perform PID measurements or laboratory analysis on soil samples to assess if soil and/or groundwater are potentially impacted. The City or City representative shall immediately be notified if impacted soil and/or groundwater is suspected or confirmed to have been encountered.

All assessment results, including sample location, sample identification and PID readings, shall be documented on a daily field log or similar form and location noted on relevant Site plan. Confirmed impacts at any area must be documented on a daily field log.

9.1.1 Excavation and Handling of Soil Materials

As part of the soil characterization discussed in sections above, hazardous materials have not been identified above ESLs appropriate for the use of the area. As outlined in Section 7, soil excavated from the Project Areas is proposed to either be reused within the Project Areas or released to a contractor for reuse within other, unrelated, commercial/industrial settings.

Where excavated soil is to be transported, the following procedures shall be followed:

- If excavated soil is to be released to the contractor for use within other, unrelated, commercial/industrial settings the soil should be directly loaded into trucks or containers and transported to the contractor's facility.
- If excavated soil is to be reused with the Project, soil should be directly loaded into trucks or containers and transported to the Project Area where it will be used OR transported to a designated temporary stockpiling location. If the soil is transported directly to the Project Area where it will be reused, it shall be stored according to BMPs outlined in the CGP. If the soil is transported to a designated temporary stockpiling location it will be stored as discussed below.
- If unexpected, contaminated soil is encountered work shall stop and the Key Project Personnel shall be notified. An isolated location within the designated temporary stockpiling location shall be reserved for storage of contaminated soil in case it is encountered.

9.1.2 Temporary Soil Stockpiling

Stockpiled soil materials should only be located in the designated temporary stockpiling location. The temporary soil stockpiling area is shown in Attachment 1 on Figure 2, as the staging area.

The following stockpiling procedures shall be implemented:

- Provide and maintain access to stockpiles.
- Reserve an unused area for stockpiling of unexpected, contaminated soils in case they are encountered.

- Separate differing materials (including non-soil materials or debris) with substantial dividers to stockpile apart to prevent mixing.
- Prevent mixing of segregated soil types (if any).
- Direct surface water away from stockpiles to prevent erosion or deterioration of material.
- Maintain temporary stockpile slope not steeper than 1.5 horizontal to 1 vertical; stockpiles shall not exceed 15 feet in height of surrounding grade.
- Secure hay bales, waddles or other approved soil erosion and sediment controls at the base of and perimeter of each stockpile, as required, to contain soil that may be impacted by erosion.
- Maintain good housekeeping surrounding stockpiles.
- Cover stockpiles with 6- to 10-millimeter polyethylene sheeting as required to withstand adverse rain, wind or inclement weather.
- Additional stockpiling and soil transportation BMPs outlined in the CGP.

9.2 Groundwater

Refer to Section 7 for groundwater handling at specific Project Areas.

Water pollution control shall be performed in accordance with the Site-specific Specifications and shall comply with the current California Water Quality Control Board's Construction General Permit Order 2009-0009-DWQ (CGP).

BMPs shall be selected, installed, and maintained in accordance with the latest edition of the California Stormwater Quality Association Storm Water Construction BMP Handbook (CASQA Handbook).

If unexpected, contaminated groundwater is encountered work shall stop and the Key Project Personnel shall be notified. If safe to do so, workers shall wear the appropriate PPE and contain the contaminated groundwater using wattles to restrict and filter the flow. The contaminated groundwater shall be pumped into containers (size to be determined as needed) and then stored appropriately. Analytical samples shall be collected to identify appropriate means of disposal.

9.3 Transportation of Contaminated Materials

If unexpected, contaminated materials are encountered the contractor is responsible for transportation activities and to maintain control of any regulated material and/or contaminated groundwater within the Project Area. This includes from the excavation to the stockpile location in approved storage containers and designated areas. The transportation vehicle shall be approved for transport of contaminated material by USDOT. Prior to transportation, the contractor shall ensure all regulated material is secure and covered with tarpaulins or equivalent sufficient covering. The contractor shall not allow contaminated soil to be deposited on public roadways and is responsible for costs incurred due to spillage of contaminated soil during transportation.

The contractor is to track material when transported on public roads and provide specific site information to designated Class I Disposal Facility. An established equipment and transportation route(s) will be defined by the contractor and agreed upon by the City.

All regulated material shall be transported by a licensed waste hauler to an approved waste disposal site, as authorized by the City. Copies of manifests and weight tickets should be provided to the City.

9.4 Decontamination Requirements

If unexpected, contaminated materials are encountered decontamination requirements shall be followed. To prevent residual contamination from leaving the Project Area by construction equipment and personnel during excavation activities, the following decontamination procedures will be followed:

– Upon completion of loading, any debris will be placed in the transportation vessel.
– To minimize the spread of contaminated soil and material track-out, equipment will be cleaned prior to movement out of active work zones. The equipment wheels/tires will be cleaned over plastic sheeting by means of shovels and stiff-bristled brooms or brushes until they are fully cleaned. Upon completion of cleaning, any debris will be placed in the appropriate transportation vessel.
– Track-out of contaminated materials shall not be allowed to spread to roadways.
– PPE worn by workers during handling of contaminated materials must be placed in a sealable trash bag and disposed of appropriately.

10. Construction Controls

All construction work areas shall have appropriate designation, delineation, and demarcation for public and worker human health and safety. Construction activities shall comply with Cal/OSHA Title 8 Regulations, Chapter 4 Division of Industrial Safety, Subchapter 4: Construction Safety Orders.

If multiple contractors are working within Project Areas each contractor shall always have a copy of the HASP and SGMP on site. Each contractor shall have at least one personnel per working shift that is 40-hour Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations & Emergency Response (HAZWOPER) trained in accordance with 29 CFR 1910.120 (OSHA 2023). The contractor shall confirm current training certifications of onsite personnel, including current annual 8-hour HAZWOPER refresher training.

10.1 Controlled Access to Work Area

If unexpected, contaminated soil or groundwater is encountered access must be controlled to the work area. Until the material can be characterized through analytical testing, it should be treated as a regulated (i.e., hazardous) contaminant. Therefore, the work area must be treated as a regulated area.

Regulated areas where hazardous materials are encountered should be delineated with well secured barrier tape and marked by signage. The regulated areas are to include areas of waste and/or debris transport loading.

Warning signs must be installed at all access locations to a regulated area. Signs should be vertical format, having a minimum dimension of 20 inches by 13 inches, and spacing between two consecutive lines should be at least equal to the height of the upper line.

General hazardous materials warning signage should be displayed.

Example language to address hazardous materials including in soil and/or groundwater hazards:

DANGER

HAZARDOUS MATERIALS WORK AREA
(Describe hazard based on most likely potential contaminant)

DO NOT EAT, DRINK OR SMOKE IN THIS AREA

Warning signage lettering should be a minimum of 2 inches high. Signs and/or barrier tape should be posted around the perimeter of each work area where potentially hazardous soil and/or groundwater related construction is conducted. Signage should be established in a manner as to be visible to any potential entrant.

The contractor should provide a gate keeper at each area designated as “Controlled Access.” The gate keeper should be always present when hazardous substance removal work is in progress or when personnel would be exposed to the hazardous substance. The gate keeper should verify that each person entering the controlled access area has received the required training and has the required PPE for the area to be entered.

10.2 Project Site Inspections

The Project Site should be inspected frequently by the contractor's supervisor or the City's representative to evaluate proper implementation of and adherence with Project work practice, engineering, and administrative controls.

10.3 Dust Control Measures

As per North Coast RWQB's CGP requirements, when handling contaminated soil the contractor shall adhere to appropriate requirements and "implement fugitive dust control measures using water or other palliatives" maintaining compliance with local Air District Control requirements. The contractor shall follow applicable CGP requirements to implement dust control measures as required by local regulatory agencies. Project Specifications shall further stipulate dust control measures required. Measures to include:

1. Employees should stay upwind 50 feet away from any areas with visible dust.
2. Wet methods (wet material and surrounding areas during work).
3. Avoid excavation during high winds.
4. Minimize contamination of personal clothing and footwear, additional PPE may be required.

10.4 Air Monitoring Requirements

It is recommended that when excavation is occurring within the Project Areas included as part of the Phase II ESA air quality and soil be monitored using a photo ionization detector (PID). Monitoring with the PID should take place at regular time intervals during excavation activities and should be recorded on a monitoring log. Samples from freshly excavated soil should be containerized in a sealable bag and PID measurements taken prior to the soil being transported for reuse within the Project, release to a contractor, or transport to the designated stockpiling area. In addition to regular PID readings, workers should be trained to identify potentially contaminated materials via visual observation and olfactory observations.

11. Regulatory Setting

The Project is subject to applicable rules and regulations governing the handling, transport and disposal of soil potentially containing COCs including, but not limited to the following:

- Federal Resource Conservation and Recovery Act (RCRA).
- California Environmental Protection Agency (Cal/EPA).
- California Health and Safety Code, Chapter 6.5, Title 22, CCR.
- California DTSC.
- California Hazardous Waste Classification rules and regulations.
- 2001 State of California Information Advisory – Clean Imported Fill Material.
- Department of Industrial Relations (DIR), Division of Occupational Safety and Health (Cal/OSHA).

12. References

SHN. 2022. Phase II Environmental Site Assessment Report of Findings, City of Eureka Flood Reduction and Sea Level Rise Mitigation Project, Eureka, California.

SHN. 2021. Hazardous Materials Corridor Study, City of Eureka Stormwater Improvements Project, Eureka, California.

San Francisco Bay Regional Water Quality Control Board (SFRWQCB). 2019. Environmental Screening Levels Rev. 1.

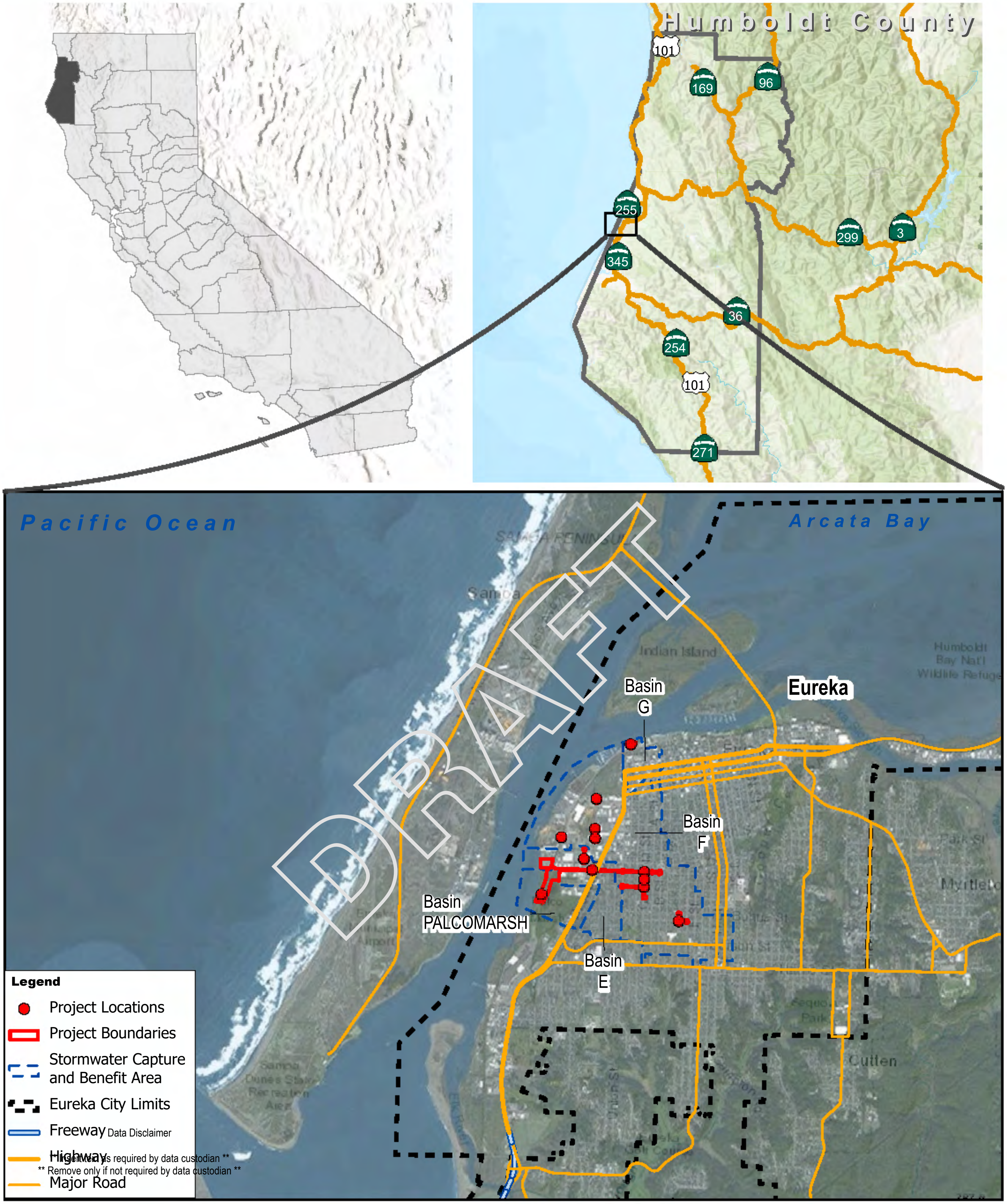
California Department of Toxic Substances Control (DTSC) Human and Ecological Risk Office (HERO). 2017. Soil Remedial Goals for Dioxins and Dioxin-like Compounds for Consideration at California Hazardous Waste Sites.

United States Geological Survey. 2023. Average Concentrations of Elements in Humboldt County, California: Average Concentration for Arsenic. Accessed September 2023: **Average concentrations of elements in Humboldt County, California (usgs.gov)**

Occupational Safety and Health Administration (OSHA). 2023. Occupational Safety and Health Standards: Part 1910 Subpart H, Standard 120 for Hazardous Waste Operations and Emergency Response.

Attachment 1

Figures



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City of Eureka
Flood Reduction and
Sea Level Rise Mitigation Project

Project Concept
Location Map

Project No. **12566459**
Revision No. **-**
Date **Sep 2023**

FIGURE 1

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City of Eureka
Flood Reduction and
Seal Level Rise Resiliency Project
Soil and Groundwater Management Plan

Project No. **12566459**
Revision No. **A**
Date **Sep 2023**

Project Boundary Map

FIGURE 2

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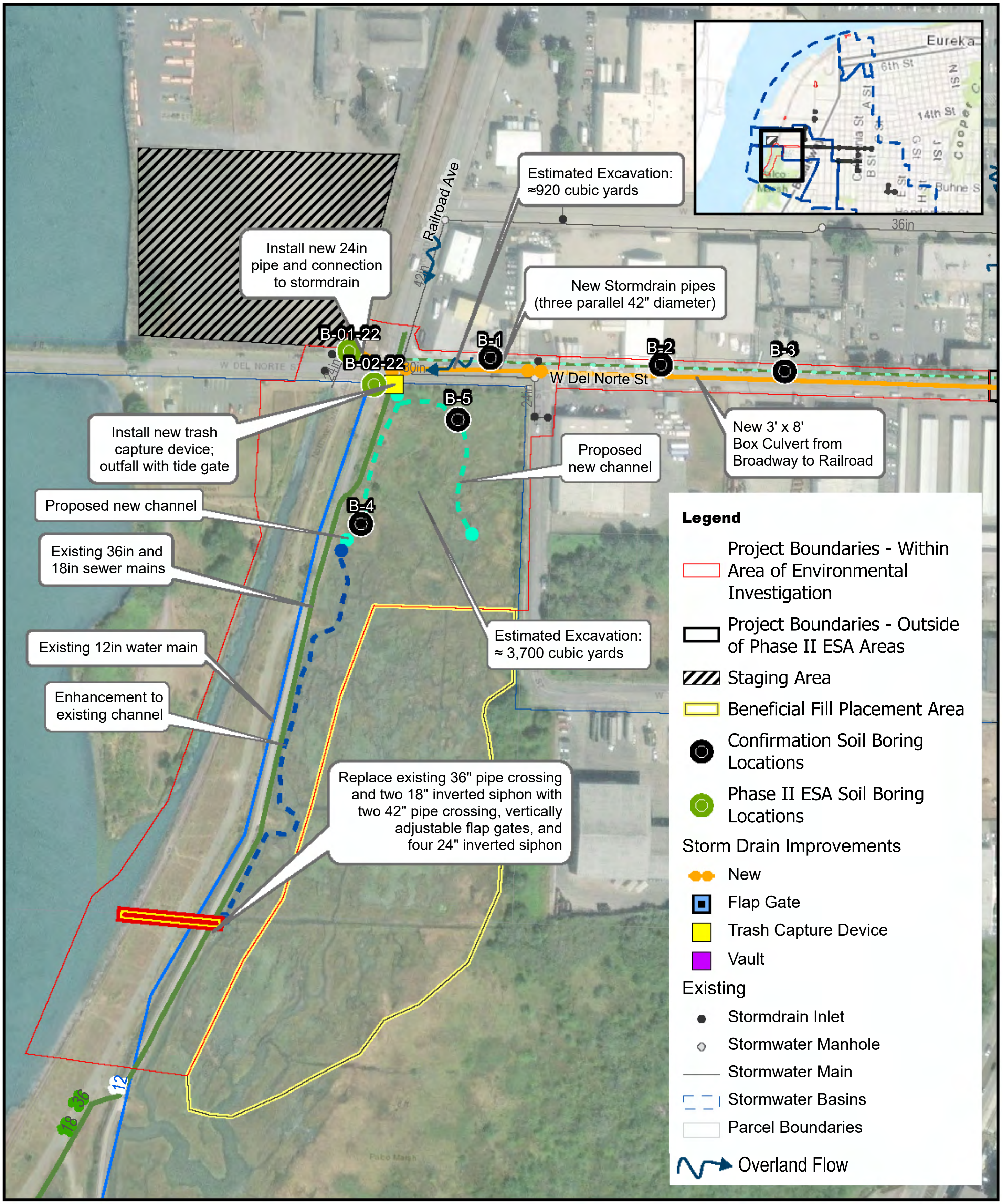

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Map Projection: Lambert Conformal Conic 2SP
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City of Eureka
Flood Reduction and
Seal Level Rise Resiliency Project
Soil and Groundwater Management Plan

Project Concept
West Del Norte Street and Palco Marsh

Project No. **12566459**
Revision No. **A**
Date **Sep 2023**

FIGURE 3

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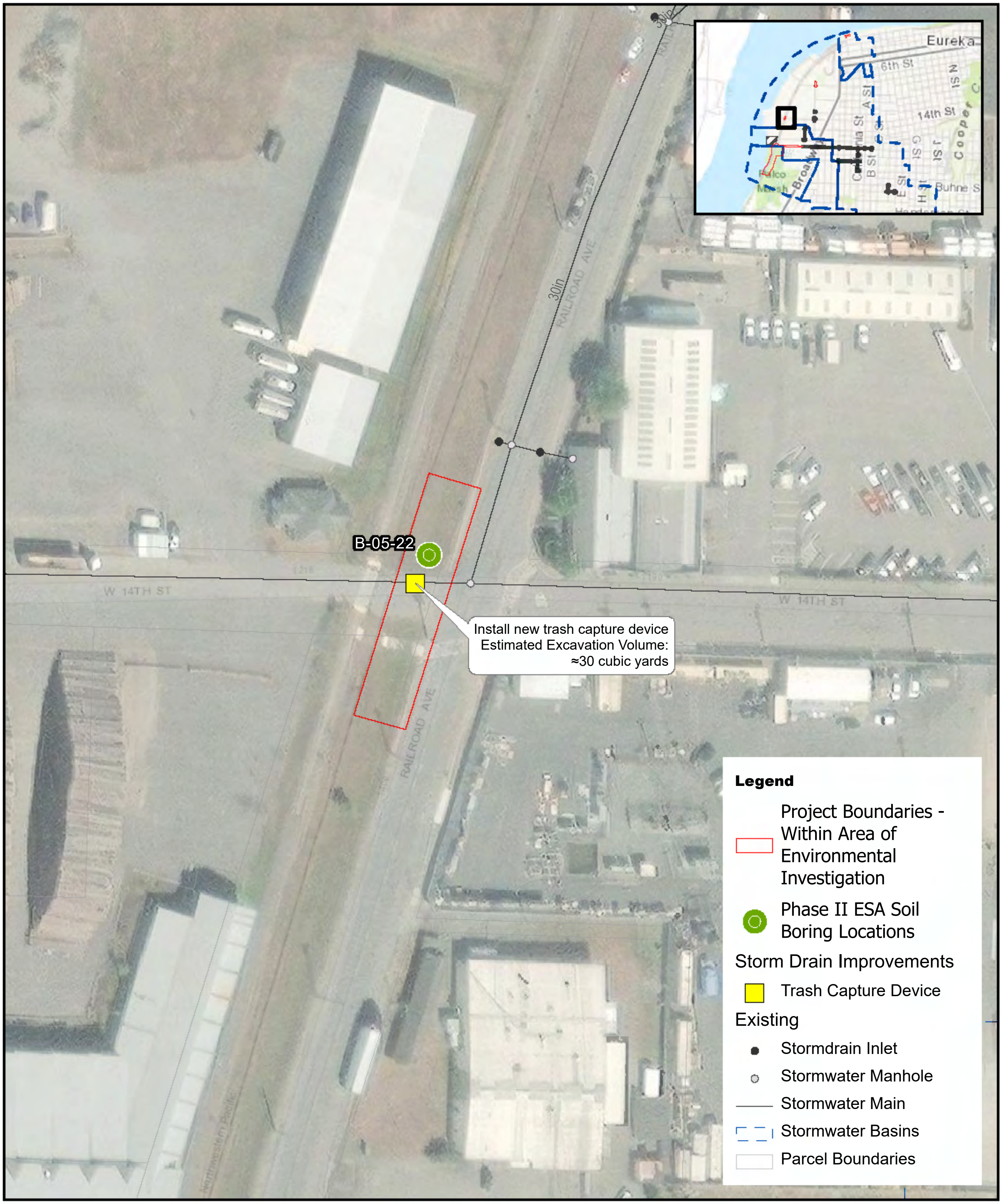

Paper Size ANSI A

0 25 50 75 100

Feet

Map Projection: Lambert Conformal Conic 2SP
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

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City of Eureka
Flood Reduction and
Seal Level Rise Resiliency Project
Soil and Groundwater Management Plan

Project Concept
West 14th Street and Railroad Avenue

Project No. **12566459**
Revision No. **A**
Date **Sep 2023**

FIGURE 4

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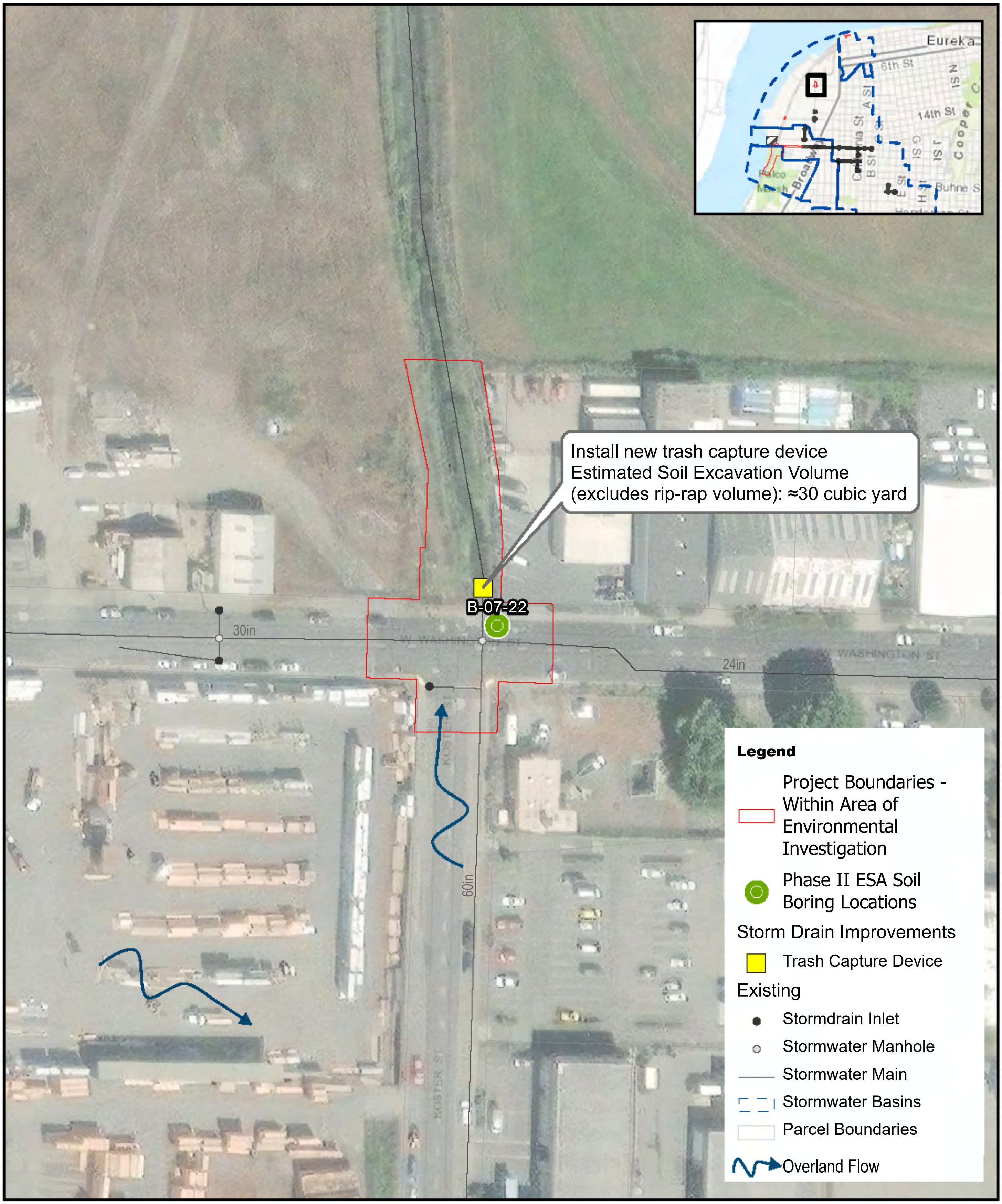

Paper Size ANSI A

0 25 50 75 100

Feet

Map Projection: Lambert Conformal Conic 2SP
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

City of Eureka
Flood Reduction and
Seal Level Rise Resiliency Project
Soil and Groundwater Management Plan

Project Concept
Washington and Koster Streets

Project No. **12566459**
Revision No. **A**
Date **Sep 2023**

FIGURE 5

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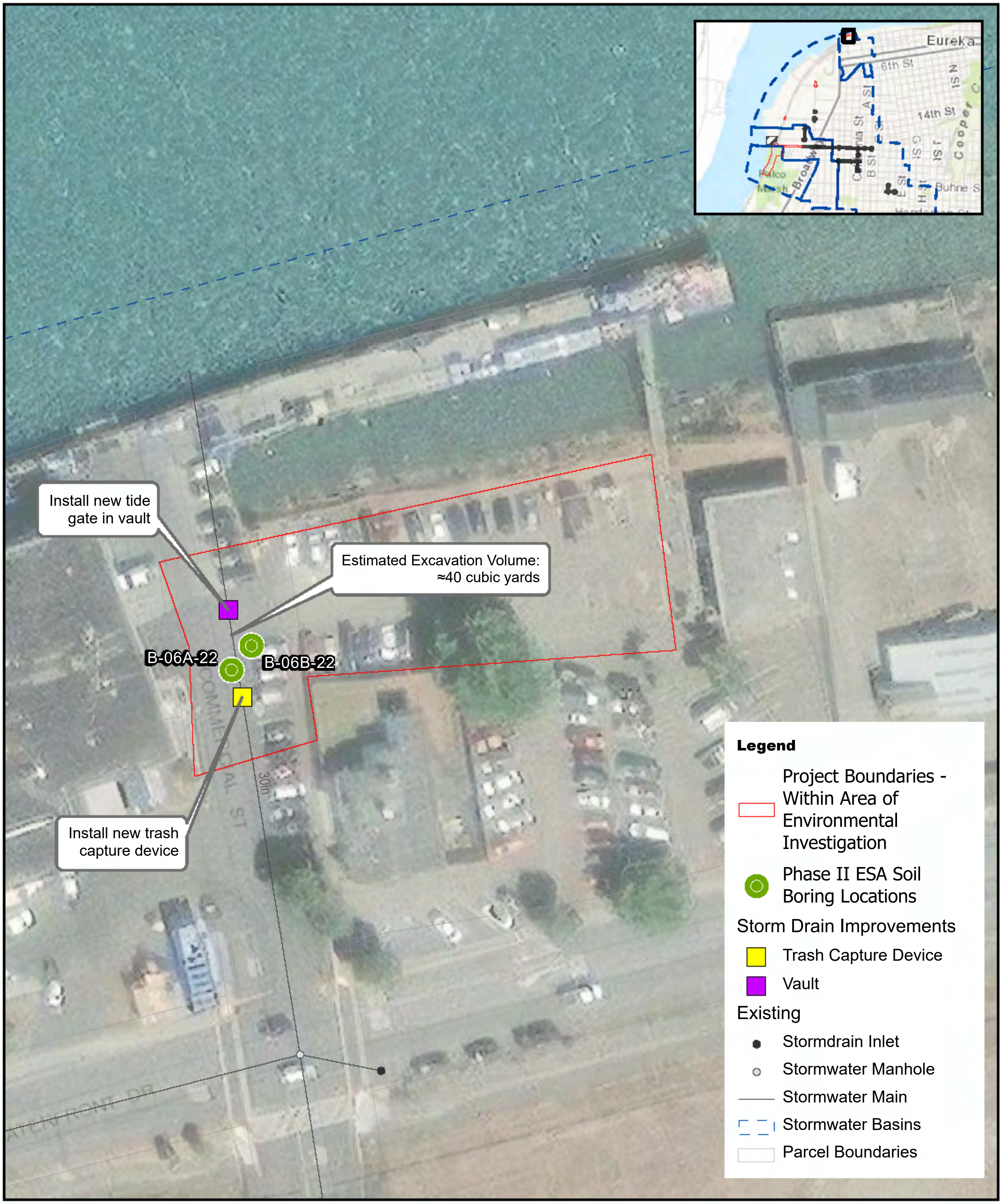
Print date: 21 Sep 2023 - 17:08

Data source: World Topographic Map; Bureau of Land Management, Esri, HERE, Garmin, USGS, EPA, USDA
World_Imagery; Maxar, Microsoft
World Topographic Map; Bureau of Land Management, Esri, HERE, Garmin, USGS, METI/NASA, NGA, EPA, USDA. Created by: jlopez4



Paper Size ANSI A

0 10 20 30 40

Feet

Map Projection: Lambert Conformal Conic 2SP
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

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GHD

City of Eureka
Flood Reduction and
Seal Level Rise Resiliency Project
Soil and Groundwater Management Plan

Project Concept
Commercial Street and Waterfront Drive

Project No. **12566459**
Revision No. **A**
Date **Sep 2023**

FIGURE 6

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Print date: 21 Sep 2023 - 17:19

Data source: World Topographic Map, Bureau of Land Management, Esri, HERE, Garmin, USGS, EPA, USDA. World_Imagery; Maxar, Microsoft
World Topographic Map; Bureau of Land Management, Esri, HERE, Garmin, USGS, METI/NASA, NGA, EPA, USDA. Created by: jlopez4

Attachment 2

SGMP Acknowledgement Form

Soil and Groundwater Management Plan Review and Acknowledgement Form

Construction Manager:	
Date:	
Property Address and Description of Work:	

In signing below, I acknowledge that I have reviewed and understand the Soil and Groundwater Management Plan dated _____________ for the property address referenced above.

Print Name	**Signature**	**Company**

This form must be signed by the Construction Manager and all site workers involved in construction activities.

Attachment 3

Field Forms

Soil and Groundwater Impact Assessment Form

Construction Manager:			
Date:			
Property Address and description of work:			
Assessment	**Yes**	**No**	**N/A**
1. Is there an odor present?			
If Yes, please describe and include PID screening results*:			
2. Is any discoloration observed in the soil?			
If Yes, please describe and include PID screening results*:			
3. Is any sheen or free product observed on the water?			
If Yes, please describe:			

If you answered “Yes” to any of the questions above, please implement separate stockpiling, water containerization, profiling, and waste management procedures. *See the Soil and Groundwater Management Plan for further details. Please draw a sketch of the impacted area in relation to current site features. Include sample identification/location. Please attach any pictures of the impacted area to this document.

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Attachment 7

65% Design Plans (attached separately)

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