Draft

DEER ISLAND BASIN COMPLEX TIDAL WETLAND RESTORATION PROJECT

Initial Study

Prepared for
Marin County Flood Control and Water Conservation District

March 2023

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Marin County Flood Control and Water Conservation District

March 2023

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D201900780.00

MITIGATED NEGATIVE DECLARATION

Marin County Environmental Review

Pursuant to Section 21000 et. seq. of the Public Resources Code and Marin County Environmental Impact Review Guidelines and Procedures, a Mitigated Negative Declaration is hereby granted for the following project.

1. Project Name: Deer Island Basin Complex Tidal Wetland Restoration Project

2. Location: Novato Creek, both sides, between SMART Railroad and State Highway 37. Assessor's Parcel Numbers 153-170-46, 153-170-44, 153-200-57, 153-200-38, 153-200-37,153-200-34, 153-200-31, 153-200-28, 153-200-27, 153-200-26, 153-200-25

3. Project Summary: The proposed project would restore ecologically valuable tidal wetlands for endangered species and improve tidal connectivity to the diked areas that were historically tidal wetlands along Novato Creek.

4. Project Sponsor: Marin County Flood Control and Water Conservation District

5. Finding:

   Based on the attached Initial Study and without a public hearing, it is my judgment that:

   ☐ The project will not have a significant effect on the environment.

   ☒ The significant effects of the project noted in the Initial Study attached have been mitigated by modifications to the project so that the potential adverse effects are reduced to a point where no significant effects would occur.

Rachel Reid _____ Date: 3/27/2023

Rachel Reid
Environmental Planning Manager

Based on the attached Initial Study, a Mitigated Negative Declaration is granted.

_____ Date: _____

President
Marin County Board of Supervisors

1. Mitigation Measures:

   ☐ No potential adverse impacts were identified; and therefore, no mitigation measures are required.

   ☐ Please refer to mitigation measures in the attached Initial Study.

   ☒ The potential adverse impacts have been found to be mitigable as noted in the Initial Study attached.

   All of the mitigation measures for the impacts listed above have been incorporated into the project and are required as conditions of approval.

2. Preparation:

   This Mitigated Negative Declaration was prepared by Roger Leventhal of the Marin County Flood Control and Water Conservation District. Copies may be reviewed at the address listed below.

   Marin County Flood Control and Water Conservation District
   3501 Civic Center Drive, Room 304
   San Rafael, CA 94903
   (415) 473-6680
   Monday-Friday, 8:00 a.m. to 5:00 p.m.

   An electronic version is also available for review on the County of Marin Environmental Planning website.

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SECTION I
Background

A. Project Sponsor's Name

Marin County Flood Control and Water Conservation District
3501 Civic Center Dr., Suite 304
San Rafael, CA 94903

B. Lead Agency Name and Address:

Marin County Flood Control and Water Conservation District
3501 Civic Center Dr., Suite 304
San Rafael, CA 94903

C. Agency Contact:

Roger Leventhal, Project Manager
Marin County Flood Control and Water Conservation District
3501 Civic Center Dr., Suite 304
San Rafael, CA 94903
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SECTION II
Project Description

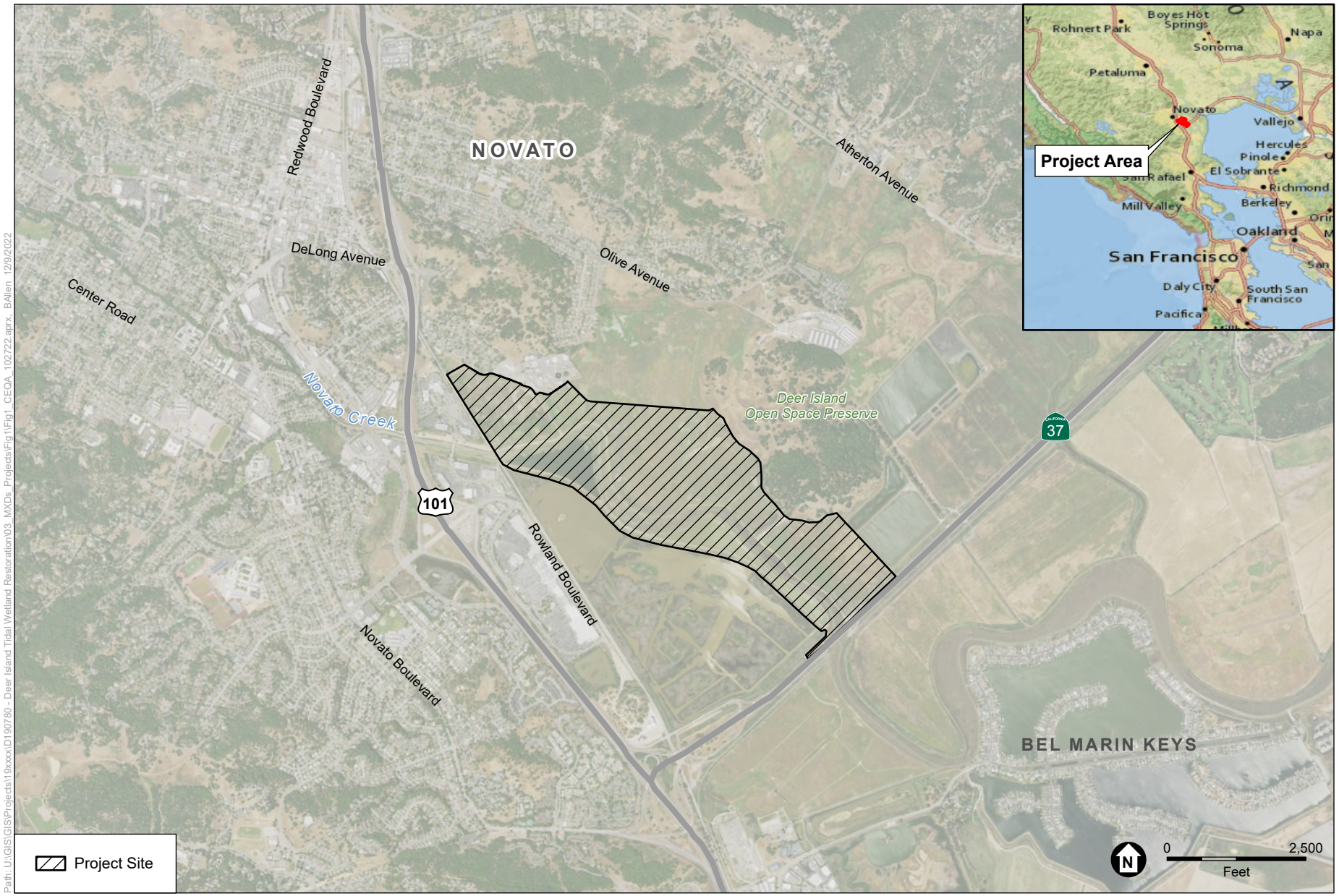
A. Project Title:	**Deer Island Basin Complex Tidal Wetland Restoration Project** (Project ID 32001125)
B. Type of Application(s):	**Habitat Restoration**
C. Project Location:	**City of Novato** **Novato Creek, both sides, between SMART Railroad and State Highway 37** Assessor's Parcel 153-170-46, 153-170-44, 153-200-57, 153-200-38, 153-200-37,153-200-34, 153-200-31, 153-200-28, 153-200-27, 153-200-26, 153-200-25
D. General Plan Designation:	**OS, Open Space**
E. Zoning:	**Publicly Owned Open Space Lands; OS:B:F1, OS:B:F2 – Open Space Baylands Flood Hazard/ Regulation Districts 1 and 2**

F. Description of Project:

Introduction and Previous Environmental Review

Marin County Flood Control and Water Conservation District (District) proposes the Deer Island Basin Complex Tidal Wetland Restoration Project (Project) to restore ecologically valuable tidal wetlands for endangered species and improve tidal connectivity to the diked areas that were historically tidal wetlands along Novato Creek. The District has determined that this would meet the definition of a "Project" under the California Environmental Quality Act (CEQA) and would be subject to review and evaluation under CEQA. To identify and assess potential environmental impacts for the Project, the following evaluation relies upon the Initial Study Checklist found in Appendix G of the [2022] State CEQA Guidelines.

The Deer Island Basin Complex is within the incorporated limits of the City of Novato and spans Novato Creek and former connected tidal marsh between the Sonoma Marin Area Rail Transit (SMART) rail line on the upstream end to north and west [parallel to Rowland Avenue] south and eastward to State Route (SR) 37 and adjacent rail bridge (see **Figure 1**). It is located within the city of Novato in northern Marin County. This



SOURCE: USDA, 2018; National Geographic, 2022; ESA, 2022

Deer Island Basin Complex Tidal Wetland Restoration

Figure 1
Regional Location

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wetland complex is comprised of Deer Island Basin, West Deer Island Basin, and Farmers Basin, north of Novato Creek, and the Heron's Beak and Duck Bill Ponds (the "Bird Ponds"), south of the creek (see **Figure 2**).

The Project evaluated pursuant to CEQA in this Initial Study consists of two main areas along Novato Creek: Duck Bill and Heron's Beak Ponds (referred collectively as the "Bird Ponds") and Deer Island Basin South[1] (see Figure 2). The Project would be implemented in two phases, starting first with the Bird Ponds and followed by the Deer Island Basin South. The remainder of the Deer Island Basin Complex (i.e., Deer Island Basin North) is not part of this current restoration project. While the District may opt to restore all of the Deer Island Basin Complex in the future, at present there are no concepts, plans, funding, etc., in place that demonstrate any firm or implied plans for restoration or other work in Deer Island Basin North on the part of the District as Lead Agency under CEQA.

The Project would restore and enhance the approximately 71.1 acres comprising the Bird Ponds, including 57.6 acres of aquatic habitat, 3.1 acres of transitional habitat, and 10.4 acres of uplands. Over time, tidal pond habitat within the Bird Ponds is anticipated to evolve into a mosaic of tidal wetland and channel habitat. Within Deer Island Basin South, the Project would restore approximately 201.1 acres in Deer Island Basin, including 187.4 acres of aquatic habitat, 3.3 acres of transitional habitat, and 10.4 acres of uplands. Open water habitat within Deer Island Basin is anticipated to evolve to mudflat and ultimately tidal wetlands and channels in the long term.

Background

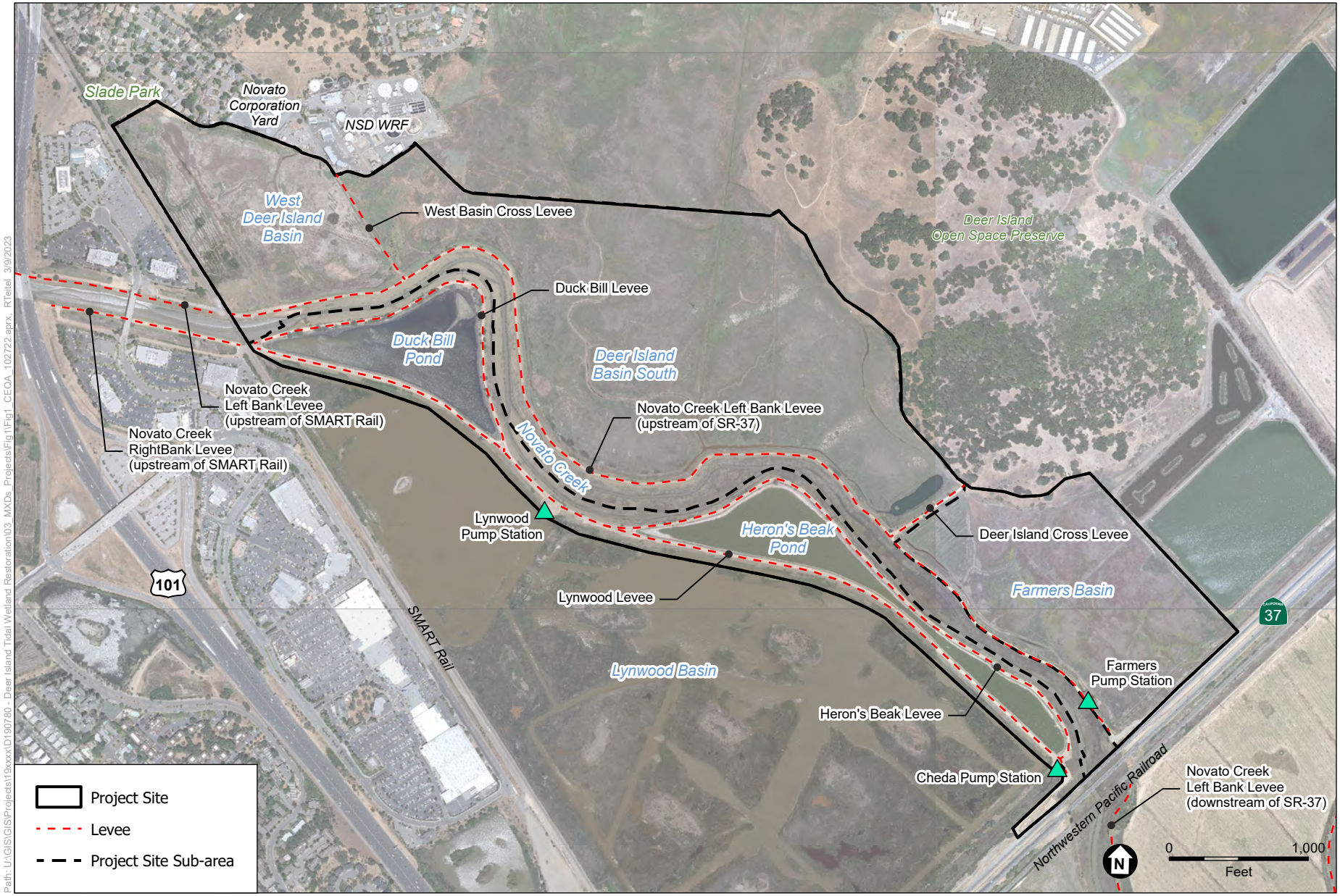
The Deer Island Basin Complex was historically part of the Novato Creek Baylands (Baylands), which have lost extensive areas of tidal wetland habitat to development and agricultural reclamation. Historically, numerous tidal channels drained to Novato Creek in the northern area of the Baylands including the Deer Island Basin Complex, while the southern area of the Baylands was slightly higher and less well-drained with associated salt ponds and pannes.[2] A wide wave-built berm, formed by washover during storm events over time, separated the historic tidal marsh and Bay-adjacent tidal flat.

In the mid-20th century, the Baylands shoreline prograded[3] from accretion of hydraulic mining sediments in the Sierras transported into San Pablo Bay via the Sacramento/ San Joaquin Delta, causing the Novato Creek mainstem to lengthen bayward by approximately 1.5 miles. Diking historic tidal marshes for agricultural use cut off Novato Creek from its historic tidal marsh flood and channels. As a result, the length of tributary

1 For the purposed of this CEQA analysis, the existing Novato Sanitary District 48-inch force main physically distinguishes Deer Island Basin South from Deer Island North.

2 Panne: intertidal habitat that tends to naturally store shallow depths (less than 12-inches) of surface water and support less than 10% cover of plant growth

3 Prograde: advancement of a coastline toward the sea as a result of the accumulation of waterborne sediment



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SOURCE: Marin Map, 2014; ESA, 2022

Deer Island Basin Complex Tidal Wetland Restoration

Figure 2
Project Area

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tidal channels to Novato Creek has decreased by 94 percent and the overall area of tidal wetlands in the Novato Creek Baylands has decreased by 83 percent (Salomon et al. 2015). The extensive loss of wetlands habitat has reduced the area available to support special status species that historically inhabited the Novato Creek Baylands. Additionally, the loss of tidal wetlands and their associated tributary channels have reduced the tidal prism conveyed by the creek channel resulting in excessive sedimentation and channel narrowing as the creek adjusts to the available tidal prism. This has significantly reduced the flood conveyance capacity of the channel.

Around the turn of the 20th century, the Deer Island Basin was diked off for grazing and agriculture and has experienced ground surface elevation subsidence since that time. Deer Island Basin currently serves as a flood storage basin for runoff from the surrounding sub-watersheds and rare flooding events from Novato Creek that may overtop the Novato Creek Left Bank Levee that borders Deer Island Basin. The Bird Ponds were constructed in conjunction with the creation of the Lynwood Levee, which was part of the 1986 Novato Creek Flood Control Project. The Bird Ponds primarily provide wildlife habitat, but also can retain/detain a relatively small volume of stormwater flows entering from the Lynwood Basin and/or Novato Creek during high flow events.

Current Project Studies

The District has commissioned multiple reports and studies in recent years which have informed the need for this Tidal Wetland Restoration Project. These include the following deliverables from the current phase of the Project:

- Environmental Science Associates (ESA), 2020a. Final Opportunities, Constraints, and Conceptual Alternatives Memorandum for the Deer Island Basin Tidal Wetland Restoration Project.
- ESA, 2020b. Deer Island Tidal Restoration Project Aquatic Resources Delineation Report.
- ESA, 2020c. Deer Island Basin Tidal Wetland Restoration Project Habitat Assessment.
- ESA 2021. Environmental Consideration for Design of the Deer Island Restoration Project.

Environmental Setting

Site Location

The Project lies within the limits of the city of Novato northwest of the SR 37/US 101 interchange (Figure 1). Unincorporated portions of Marin County border the Project site to the north near Deer Island Open Space Preserve and to the south along SR 37. Located in the eastern half of the city, Deer Island Basin is bordered by commercial and office development, the NSD RWF, the City of Novato Corporation Yard, and the SMART rail line on the west, residential areas along Olive Avenue to the north, Deer Island Open Space Preserve to the east, and Novato Creek to the south, which flows east to San Pablo Bay (Figure 2). Between Novato Creek and the Lynwood Basin to the

south are two leveed non-tidal wildlife ponds referred to collectively as the Bird Ponds – Duck Bill Pond is the upstream pond along Novato Creek and Heron's Beak Pond is downstream. SR 37 and the Northwestern Pacific Railroad Company crossing of Novato Creek are just downstream of the Heron's Beak Pond (Figure 2).

The Project lies within Flood Zone No. 1, which is Marin County's largest flood control zone, encompassing the entire city of Novato, plus a sizeable amount of unincorporated area around the city.

The Deer Island Basin and Novato Creek are owned by the District (**Figure 3**). Within Deer Island Basin, NSD has easements to maintain their various force mains and sludge lines traversing the basin. The Bird Ponds and Lynwood Basin are largely owned by the State of California and under jurisdiction of the State Lands Commission (SLC), with interior portions of the Bird Ponds managed by the California Department of Fish and Wildlife (CDFW) and the Lynwood Basin levee corridor leased by the SLC to the District.

Existing Conditions

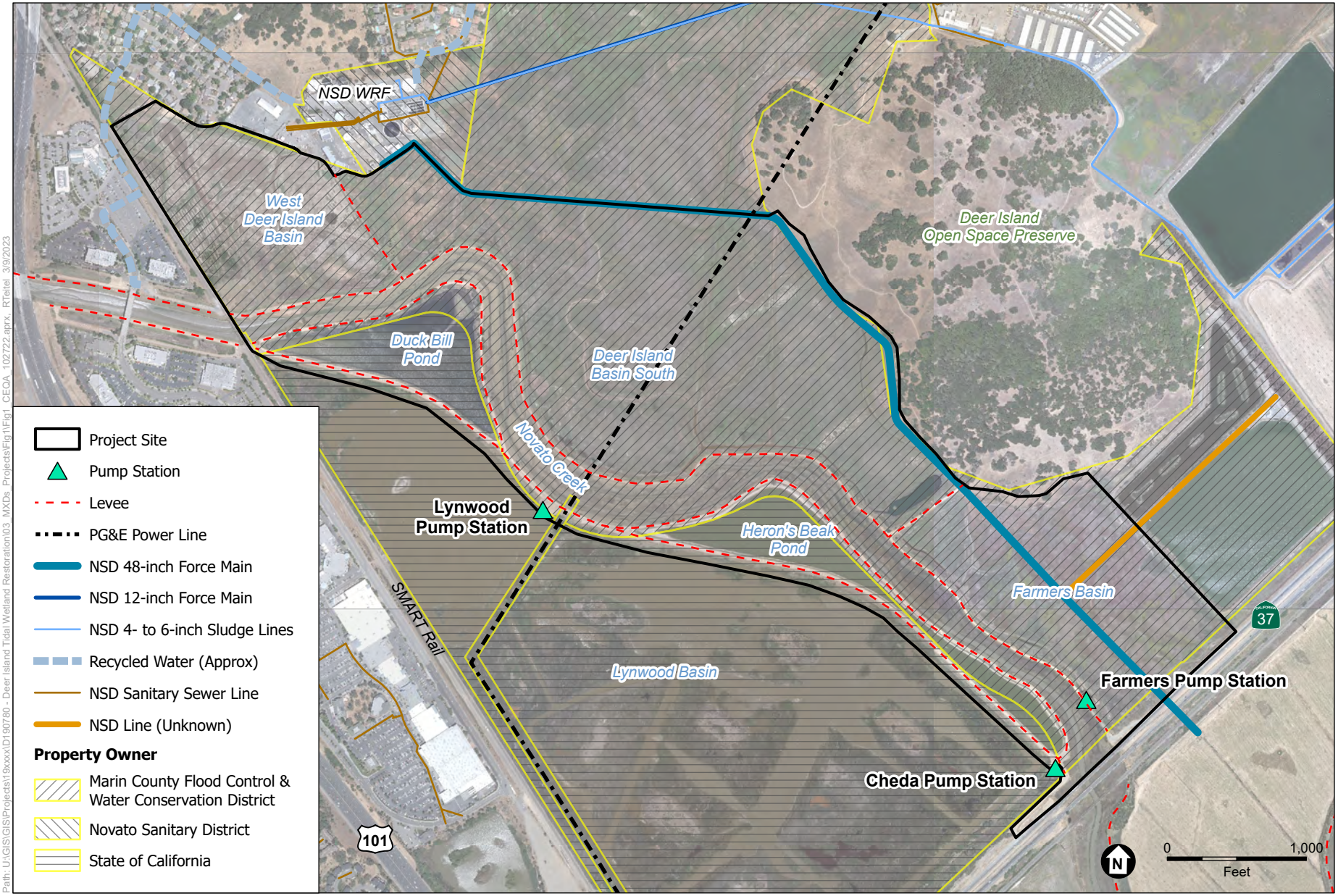
As noted above, Deer Island Basin currently serves as a flood storage basin for rare high flood flow events that overtop the perimeter levee and runoff from the surrounding sub-watersheds. The Novato Sanitary District maintains pipelines within the basin. Additionally, the District uses a small portion of the Deer Island Basin as a beneficial reuse location for material removed from lower Novato Creek.

For use as wildlife habitat, the Bird Ponds can be filled with pumps from the Lynwood and Cheda Pump Stations (see Figure 2) to augment incidental rainfall. Duck Bill Pond has no constructed outlet, although if the water level is high enough water can spill over a rocky weir into Novato Creek. Heron's Beak Pond has a 30-inch culvert with slide gate that can partially drain to Novato Creek when water levels in the creek are low. Following placement of sediment from the 2020 sediment removal in the pond, a fish screen was placed between the culvert and Novato Creek. The fish screen allows the culvert to remain open from June to February, allowing the flow of brackish waters from Novato Creek into Heron's Beak Pond, to create muted tidal wetlands within the pond. The culvert is currently eroding at the bottom which allows some tidal exchange during high tides even when the slide gate is closed. Per requirements of the National Marine Fisheries Service (NMFS), the culvert is closed and a plug is in place from February to June to protect fish from getting into Heron's Beak Pond.

Infrastructure

Various utilities and infrastructure present within and adjacent to the Project site are shown in Figures 2 and 3 and are summarized below.

- *NSD Treatment Facilities.* The NSD RWF borders the Deer Island Basin to the north and is connected to a system of buried pipelines throughout the basin, including a 48-inch force main, a 4- to 6-inch sludge line, and a 12-inch force main.



SOURCE: Marin Map, 2014; Marin Co., 2018; ESA, 2022

Deer Island Basin Complex Tidal Wetland Restoration

Figure 3
Land Ownership and Existing Utilities

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- *Pacific Gas and Electric (PG&E) Power Lines.* PG&E maintains both electric distribution and transmission systems within the Project site. The distribution and transmission lines area located within an easement that runs from SR 37 north along the edge of Lynwood Basin, parallel to the SMART rail line. The lines then cross Lynwood Basin between Duck Bill and Heron's Beak Ponds. The distribution lines and poles terminate at the Lynwood Levee and provide power to the Lynwood Pump Station. The transmission lines and towers continue through Deer Island Basin and Deer Island Open Space Preserve and beyond the Project site area. The transmission lines are supported by transmission towers on concrete supports.
- *SMART Rail Bridge.* This bridge across Novato Creek, which parallels Rowland Boulevard, is 18 feet wide and spans 245 feet with eight piers.
- *SR 37 Bridge.* This bridge, crossing Novato Creek downstream of the Project site, is comprised of two decks each 33 feet wide on 25 piers.
- *Northwestern Pacific Railroad Bridge.* This bridge, paralleling the SR 37 immediately downstream over Novato Creek, is 16 feet wide on 33 piers.
- *Cheda Pump Station.* This pump station is located near SR 37 at the intersection of the Heron's Beak Levee and the Lynwood Basin Levee. The pump station is used to move water from Cheda Creek into Heron's Beak Pond.
- *Lynwood Pump Station.* This pump station is located on the Lynwood Basin Levee, between Duck Bill and Heron's Beak Ponds. The pump station is used to drain Lynwood Basin into Novato Creek.
- *Farmers Pump Station.* This pump station is located on the Novate Creek Left Bank Levee (upstream of SR 37), adjacent to Farmers Basin. The pump station is used to drain Farmers and Deer Island Basins.

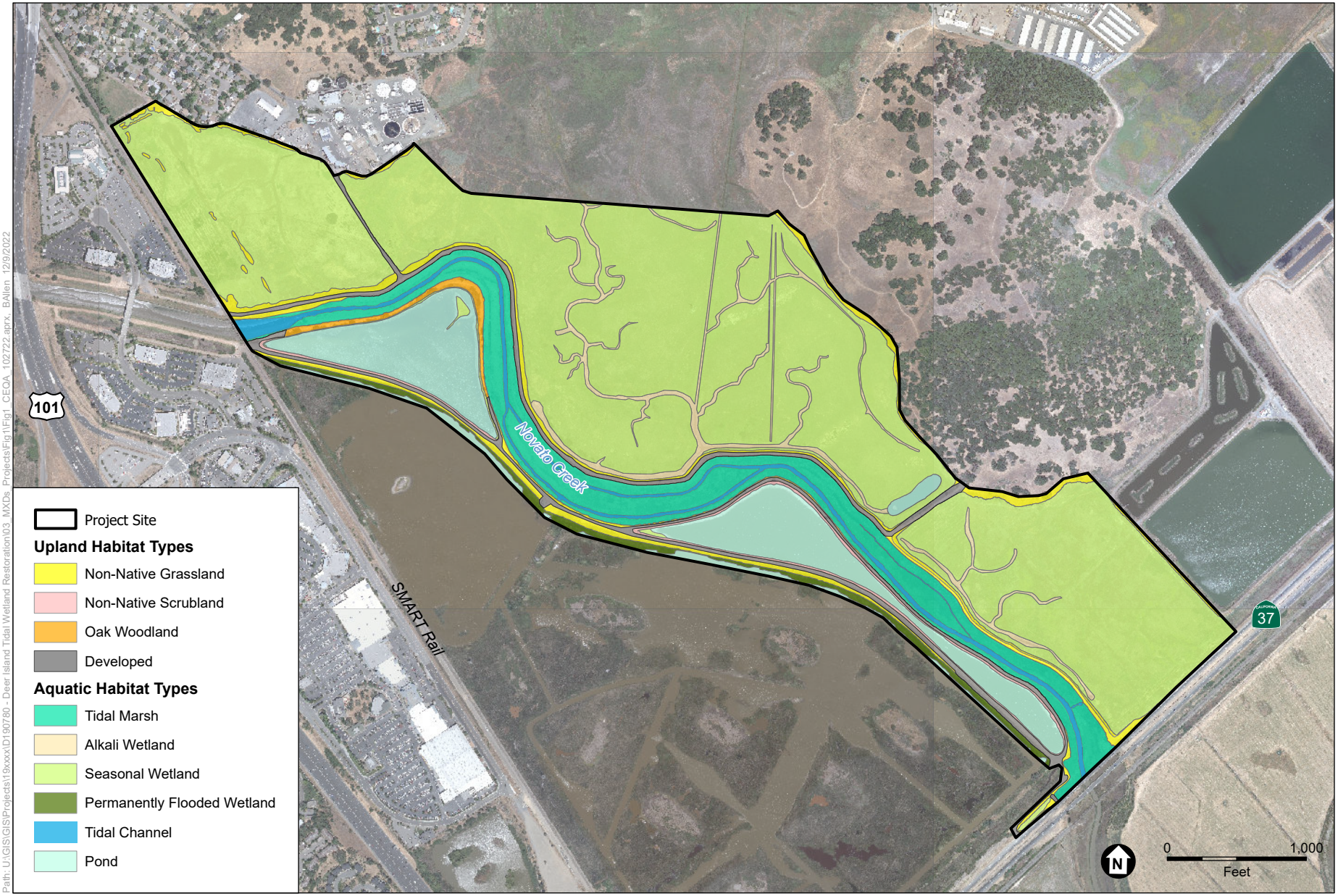
Habitat

The Project site contains four upland habitat types and seven habitat types associated with aquatic features. The following upland habitat types occur within the Project site, shown in **Figure 4**:

- Non-native grassland
- Non-native scrubland
- Oak woodland
- Developed land

Aquatic habitat types within the Project site include:

- Tidal channel
- Tidal marsh
- Seasonal wetland
- Alkali wetland
- Permanently flooded wetland
- Pond



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SOURCE: Marin Map, 2014; ESA, 2022

Deer Island Basin Complex Tidal Wetland Restoration

Figure 4
Habitat Types

ESA

Access

Public access is currently not allowed within the Project site, although there are locations where physical access may be gained. The existing levees are not open for public access, with access restricted by the District and SMART (e.g., no trespassing signs, no access for cars). Conditions at most access points into the Deer Island Basin present challenges with regards to safety and accessibility. Public access opportunities are limited due to perimeter safety concerns, and access restrictions associated with the SMART rail and SR 37 would require extensive agency, stakeholder, and public coordination that area beyond the scope of this Project.

Public access is allowed at the adjacent Deer Island Open Space Preserve which forms the northeastern edge of the Deer Island Basin and at Slade Park which is adjacent to the northwest corner of the Deer Island Basin. The Open Space Preserve is owned and operated by Marin County Parks and Slade Park is owned and maintained by the city of Novato. Neither park is a part of this Project.

Proposed Project

Background

As discussed in detail above, the Novato Creek Baylands have lost extensive areas of tidal wetland habitats to development and agricultural reclamation. San Francisco Estuary Institute's (SFEI's) Flood Control 2.0 Project (2015) identified the Novato Creek Baylands as a large and critically important area for restoration, as explained here. The Deer Island Basin Complex is located at the ecologically important fluvial/tidal interface several miles upstream from San Francisco Bay proper. Restoration of habitat in this ecological location is important for species that live at the edge of tidal and fluvial habitats. Additionally, this location is ideal to capture fluvial sediments conveyed from the upper watershed to help reverse the historic subsidence and keep pace with near-term sea level rise. This Project will contribute to the larger goal of the restoration over 1,000 acres[4] of historic tidal marsh in the lower Novato Creek Baylands.

Project Purpose

The purpose of this Project is to restore ecologically valuable tidal wetlands for improved endangered species habitat and tidal connectivity to the diked areas that were historically tidal wetlands along Novato Creek. The objectives of the Project are as follows:

- Restore floodplain and tidal connectivity to diked historic tidal wetlands along Novato Creek.

[4] Acreage goals do not include restoration of the Hamilton Wetlands nor the Bel Marin Keys Unit V, which are covered under separate existing restoration plans. (SFEI, 2015)

- Enhance ecological functions within existing and historic Baylands habitats along and adjacent to Novato Creek, including the tidally influenced Novato Creek channel, diked tidal marshes and Bird Ponds, and adjacent transition zones and upland areas.
- Preserve and improve habitat conditions that support native species that occur within the system as it evolves from a muted tidal regime[5] immediately following restoration towards a larger more natural tidal range over time with the ultimate goal of enhancing habitat for special status species known to occur, currently and/or historically, within Novato Creek and its associated tidal marshes.
- Contribute to long term flood control goals for the lower Novato Creek Baylands by increasing hydraulic conveyance of flood flows within the Novato Creek channel in response to increased tidal exchange associated with restoration of the adjacent diked Baylands, managing temporary potential increases in flood levels along the creek, and ultimately reducing flood levels along the creek after conveyance within the corridor increases.
- Protect critical infrastructure located within and adjacent to the Project site by maintaining current levels of flood protection and/or providing maintenance access to existing infrastructure until the infrastructure can be either relocated outside of the basin or replaced with infrastructure that requires limited maintenance/access within a tidal environment.

Project Components

This section introduces the components of the Deer Island Basin Complex Tidal Wetland Restoration Project (Project), as well as the restoration and flood protection improvements to be provided by each component.

The Project consists of three main areas along Novato Creek: Duck Bill and Heron's Beak Ponds (Bird Ponds), Farmers Basin, and Deer Island Basin South. The Project would restore ecologically valuable tidal wetlands for special-status species by providing full tidal connectivity to the diked areas that were historically tidal wetlands along Novato Creek. In the Bird Ponds, approximately 71.1 acres of tidal wetland and open water, transitional, and upland habitats would be enhanced or restored. Over time, tidal pond habitat within the Bird Ponds is anticipated to evolve into a mosaic of tidal wetland and channel habitat. In conjunction with the Bird Ponds restoration, the Novato Creek Left Bank Levee adjacent to Farmers Basin would be raised to provide improved flood protection. About 6 acres of the roughly 55-acre area that comprises Famers Basin would be modified to improve the levees. In Deer Island Basin South, about 187 acres of aquatic habitat would be restored, including tidal channels, tidal pond, and tidal wetland habitat. Open water tidal pond habitat within Deer Island Basin South is anticipated to evolve to mudflat and ultimately tidal wetlands and channels in the longer term. The anticipated restored and enhanced habitat areas for the Project are summarized in **Table 1** below.

[5] Muted tidal regime: A fluctuation in tidal water level that is lower in amplitude than the full tidal range due to factors inhibiting exchange of water between the muted tidal location and the fully tidal location.

TABLE 1
BIRD PONDS, FARMER'S BASIN, AND DEER ISLAND BASIN SOUTH HABITAT POST PROJECT HABITAT ACREAGES

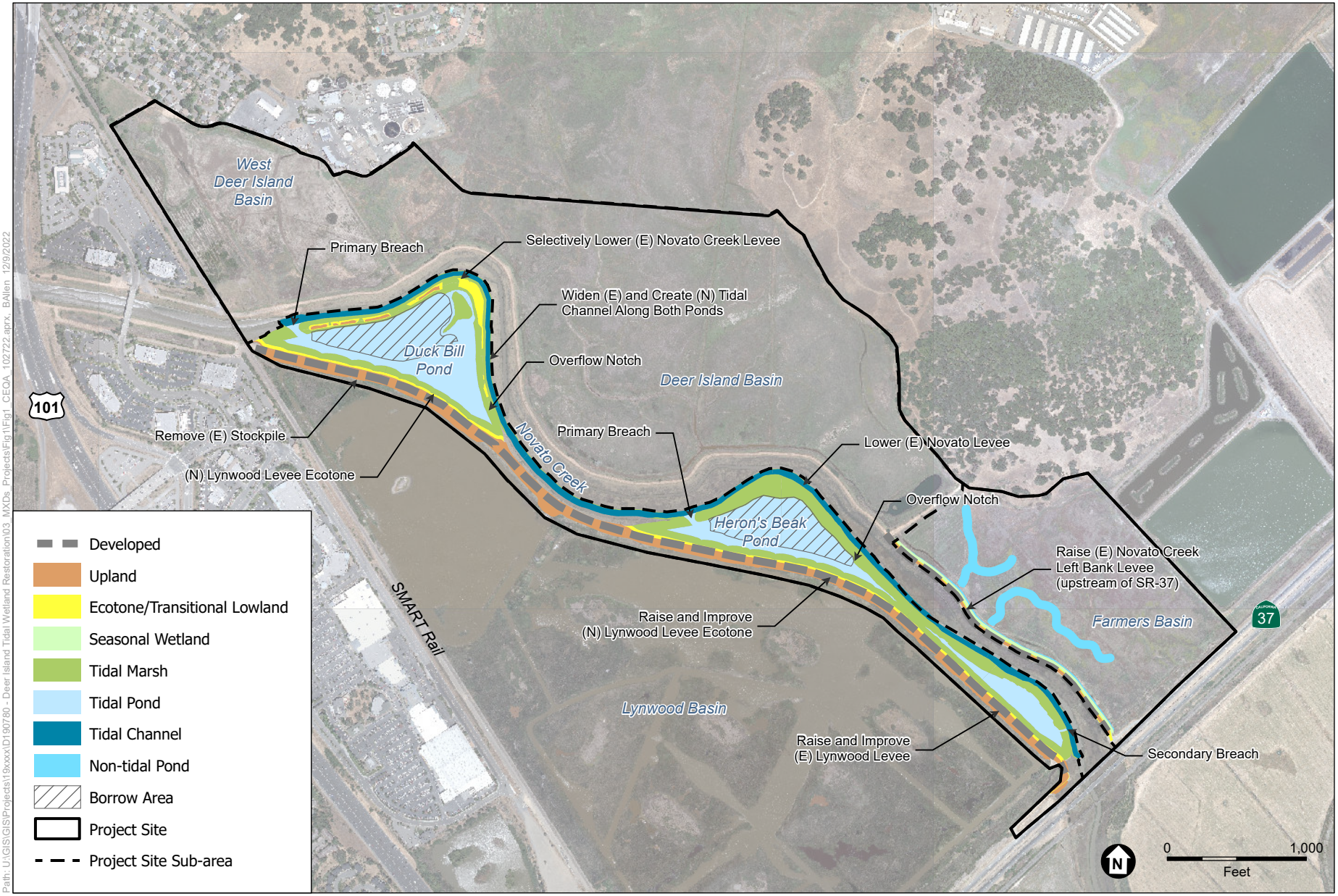
Habitat Types		Post Project Acres		
		Bird Ponds	Farmers Basin	Deer Island Basin South
Upland	Native Grassland/Scrubland	5.8	2.0	7.6
	Non-native Grassland	0.0	1.1	0.0
	Non-native Scrubland	0.0	0.0	0.0
	Oak Woodland	0.5	0.0	0.0
	Ecotone/transitional	3.1	0.0	3.3
	Developed	4.1	0.6	2.8
Aquatic	Tidal Marsh	18.9	0.0	35.5
	Seasonal wetland	0.2	47.5	42.9
	Alkali wetland	0.0	0.0	0.3
	Permanently flooded wetland	5.1	0.0	0.0
	Tidal channel (Novato Creek)	7.7	0.0	13.3
	Non-Tidal Pond	3.4	3.6	0.0
	Tidal Pond	22.3	0.0	95.4
TOTAL		**71.1**	**54.8**	**201.1**

The Project would be implemented starting first with construction of the Bird Ponds and followed by the Deer Island Basin South. A more detailed discussion of Project construction and phasing is found in the Project Construction section. The anticipated habitat restoration, flood protection, and other elements that comprise the Project are described below.

Duck Bill and Heron's Beak Ponds (Bird Ponds) Restoration

The Bird Ponds portion of the proposed Project restores ecologically valuable tidal wetland and open water habitats to support special status species, while providing continued flood protection and improving near-term sea level rise resiliency along Novato Creek. The plan view of the proposed preliminary design for the Bird Ponds is presented in **Figure 5** with representative cross-sections presented in **Figure 6a** and **Figure 6b**.

Approximately 71.1 acres of tidal wetland and open water, transitional, and upland habitats would be restored in the Bird Ponds, gradually evolving into tidal wetlands and associated tidal channels. The Bird Ponds would be restored by breaching and lowering the existing levees along Novato Creek to restore tidal connectivity to the ponds. The Duck Bill Levee and Heron's Beak Levee would be lowered to create a range of high marsh to mid marsh habitat, including areas of ecotone and uplands. Upland areas where existing mature mitigation trees were planted in the 1990s would be preserved to the extent possible. Some tree removal would be necessary to execute some levee improvements and is discussed in greater detail in the Biological Resource evaluation in Section VI. Within the Novato Creek corridor, new tidal channel habitat would be excavated to increase tidal conveyance and sediment delivery to the Bird Ponds, while



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SOURCE: Marin Map, 2014; ESA, 2022

Deer Island Basin Complex Tidal Wetland Restoration

Figure 5
Bird Ponds Restoration Plan

ESA

also providing material to improve the Lynwood Levee. Flood protection would be provided by improving the Lynwood Levee in certain locations along the western edges of the ponds by both raising the levee near SR 37 and creating ecotone slopes along the levee within the restored ponds and adjacent Lynwood Basin. The following subsections describe habitat restoration, flood protection, utility and infrastructure protection, and resiliency to future conditions elements that comprise the proposed Project.

Habitat Restoration

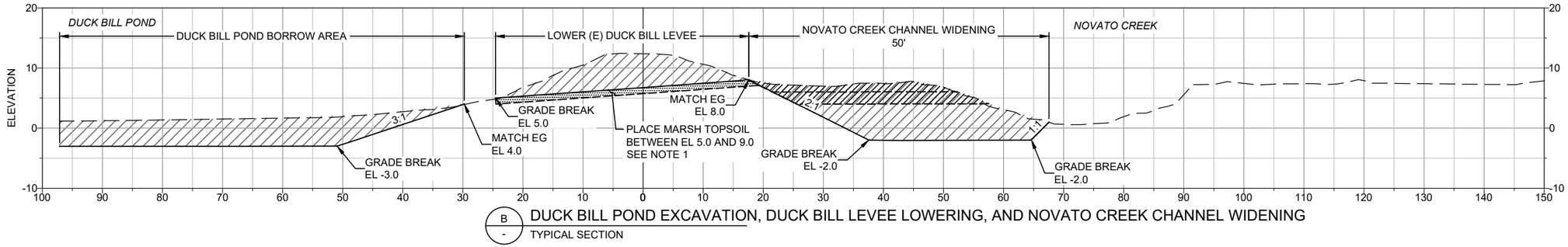
Restoration of the Bird Ponds involves creating and enhancing creek channel, tidal wetland and open water, and adjacent terrestrial lowland and upland habitat, to support a diversity of plant communities and wildlife species. Each proposed habitat element is described below and shown in Figure 5.

Novato Creek Channel

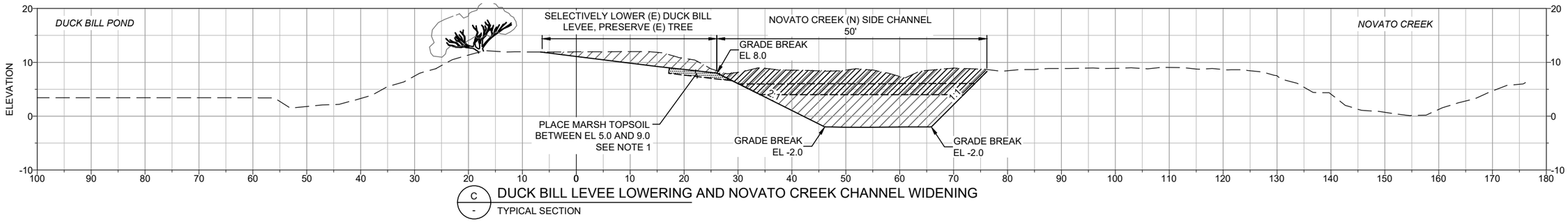
The Novato Creek channel would be enhanced by both widening the creek channel in areas where the existing channel is immediately adjacent to the Duck Bill and Heron's Beak Levees and creating new side channels to the main channel in areas where the existing channel is further from the Duck Bill and Heron's Beak Levees. This widening and side channel creation would increase the hydraulic conveyance capacity of the creek by removing sediment that has accumulated in the channel due to loss of historic tidal marsh prism along Novato Creek. The widened and newly created channels would also accelerate channel evolution post restoration, allowing for the development of full tidal range in the Bird Ponds and creek, helping to restore natural physical processes to the system, which would support tidal marsh habitat development and flood protection resiliency. Additionally, increasing the tidal conveyance would help maintain the existing floodplain habitat by reducing tidal muting and allowing king tides to inundate areas of the floodplain that have aggraded above high marsh elevations. Material excavated from the channel would be beneficially reused to create intertidal and transitional habitat along the Lynwood Levee.

Additionally, excavation within the floodplain would occur within a 50-foot corridor along the creek side of the existing Duck Bill and Heron's Beak levees. The 50-foot-wide excavated channel would leave the majority of the existing 145- to 345-foot-wide tidal marsh habitat present in the Novato Creek floodplain corridor untouched.

The restored tidal channel habitat in Novato Creek would support habitat for a variety of species. At low tides, foraging and roosting habitat would be provided for shorebirds such as western and least sandpiper (*Calidris* sp.), greater yellowlegs (*Tringa melanoleuca*), black-necked stilt (*Himantopus mexicanus*), short-billed dowitcher (*Limnodromus griseus*), and semi-palmated plover (*Charadrius semipalmatus*). The increased channel area would also provide habitat for ducks such as mallard (*Anas platyrhynchos*), gadwall (*Mareca strepera*), green-winged teal (*Anas crecca*), and northern shoveler (*Spatula clypeata*). Habitat for native fish species, such as threespine stickleback (*Gasterosteus aculeatus*), Prickly sculpin (*Cottus asper*), California roach (*Hesperoleucus symmetricus*), Sacramento sucker (*Castostomus occidentalis*), steelhead (*Oncorhynchus mykiss*), and Pacific staghorn sculpin (*Leptocottus armatus*) would also be provided.



B / - DUCK BILL POND EXCAVATION, DUCK BILL LEVEE LOWERING, AND NOVATO CREEK CHANNEL WIDENING
TYPICAL SECTION



C / - DUCK BILL LEVEE LOWERING AND NOVATO CREEK CHANNEL WIDENING
TYPICAL SECTION

SOURCE: ESA, 2022

Figure 6a

Duck Bill Pond – Representative Cross-Sections

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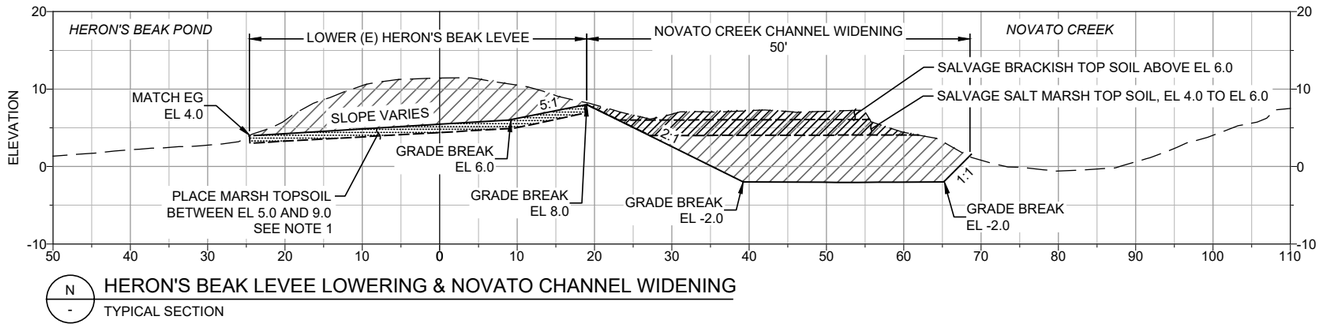

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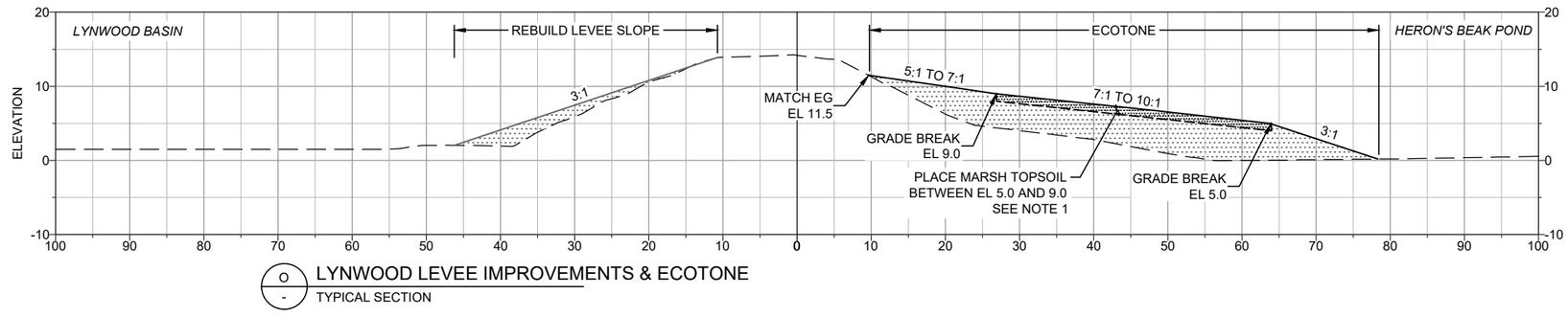
HERON'S BEAK LEVEE LOWERING & NOVATO CHANNEL WIDENING

TYPICAL SECTION



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LYNWOOD LEVEE IMPROVEMENTS & ECOTONE

TYPICAL SECTION

SOURCE: ESA, 2022

Deer Island Basin Complex Tidal Wetland Restoration - D190780.00

Figure 6b

Heron's Beak Pond/Lynwood Levee – Representative Cross-Sections

ESA

Tidal Wetland and Open Water

Tidal wetland and open water habitat would be restored within Duck Bill and Heron's Beak Ponds by lowering the existing Duck Bill and Heron's Beak Levees to tidal wetland elevations, creating new tidal wetlands along the Bird Ponds side of the Lynwood Levee using material excavated from the existing Bird Ponds levees and Novato Creek floodplain, and breaching the existing Bird Pond levees to re-introduce tidal hydraulic connectivity.

Tidal wetland habitat would be created on the Duck Bill and Heron's Beak Levees by lowering the levees to high- to mid-marsh elevations, providing a more contiguous connection between the existing marsh habitat along the Novato Creek channel and the restored ponds. The levee would be lowered to variable elevations for topographic complexity to provide high tide refuge for special status species while maintaining elevations that would minimize colonization by invasive upland vegetation. Since high tide refugia habitat does not readily develop through natural processes, and this challenge compounds with sea level rise, the intent is to maintain some portions of the levee at elevations that are as high as possible while still supporting native high marsh vegetation.

Levee lowering also includes over-excavating sections of the existing levee and placing a layer of topsoil, excavated as part of the Novato Creek channel enhancements described above, on the lowered levee sections to help support native marsh plantings. Beneficially reusing topsoil from the adjacent floodplain is expected to support rapid re-establishment of a similar plant community on the lowered levees directly adjacent to the floodplain. Along Duck Bill Pond, 2,800 linear feet of levee lowering is proposed in a selective manner that preserves the existing oak and other native trees along the levee to the extent that allows for this levee improvement. Along Heron's Beak Pond, 4,150 linear feet of levee lowering is proposed along the entirety of the pond.

Tidal wetland and ecological transition zone habitat would also be created on the Bird Ponds side of the Lynwood Levee as part of the new levee ecotones along Lynwood Levee. The levee ecotones range in elevation and provide a variety of habitats including uplands, transitional lowlands, high to low marsh, mudflat and sub-tidal. High to mid-marsh habitat would be created along gentle slopes while low marsh, mudflat, and subtidal habitats would be created along slightly steeper slopes between the pond bottoms and the higher gentle slopes.

Tidal connection between the ponds and Novato Creek would be achieved through a combination of primary upstream breaches and secondary downstream breaches in each pond. The larger primary upstream breaches would be sized to convey the full restored tidal prism for each pond and would help facilitate sediment accretion within the ponds by intercepting fluvial sediments transported down the creek. The smaller secondary, downstream breaches would be overflow connections to Novato Creek to allow flood flows to reconnect with the main Novato Creek channel and would limit outflows/flow through at low tides to help improve sediment capture within the ponds.

Over time, the secondary overflow breaches are anticipated to scour and erode and may develop into a second tidal connection to Novato Creek in each of the Bird Ponds.

The remaining areas of the ponds, consisting in the existing conditions of managed non-tidal open water in Duck Bill Pond and managed muted tidal open water in Heron's Beak Pond, would be converted to tidal open water. As Novato Creek channel naturally increases in size and depth in response to the increased tidal prism created by the restored Bird Ponds, the tidal range of the restored tidal open water would also increase to better match the natural tide range. In addition, the area of tidal open water would also evolve as the pond bottom elevations increase as sediment from Novato Creek accretes, with tidal open water habitat gradually converting to tidal wetland habitat.

The tidal wetlands and open water would provide habitat for a variety of different species. Tidal marsh vegetation provides nesting and foraging opportunities and cover for both ducks and shorebirds, as well as providing habitat for special status species such as California Ridgway's rail (*Rallus obsoletus obsoletus*) and California black rail (*Laterallus jamaicensis*). High marsh habitat would also support small mammals, such as the salt marsh harvest mouse (*Reithrodontomys raviventris*), providing cover and available flood refuge habitat.

Transitional Lowland

Transitional lowland habitat would be created on the Bird Ponds side of the Lynwood Levee as part of the new levee ecotones along Lynwood Levee. The transitional lowland habitats would include lowland grassland and seasonal wetlands and would be successional habitat, gradually converting to tidal marsh with sea level rise. Transitional lowland habitat would also be created and enhanced along the Duck Bill and Heron's Beak Levees as part of the levee removal as described above.

Upland

Upland habitat would be restored, created, and enhanced along the Lynwood, Duck Bill, and Heron's Beak Levees as part of levee improvement along Lynwood Levee and levee removal along Duck Bill and Heron's Beak. Upland areas adjacent to wetland areas provide habitat for lizards, snakes, small mammals, and birds, such as the western fence lizard, gopher snake, western harvest mouse, and western meadowlark.

Flood Protection

In addition to habitat restoration, work proposed in the Bird Ponds would also maintain or improve the current level of flood protection while improving sea level rise resiliency along Novato Creek. Widening the Novato Creek Channel would increase the flood conveyance through this reach, while reconnecting the Bird Ponds to Novato Creek would provide increased floodplain storage volume.

Expanding the Novato Creek corridor and connecting the creek to the Bird Ponds reduces 50-year design flood levels along developed areas upstream of the Project site (i.e., from just downstream of the SMART rail crossing to upstream of Redwood

Boulevard). Just upstream of SR 37, water levels under existing conditions can overtop the Novato Creek left bank levee and the creek is constrained by the existing railroad crossing. In this area, the project would increase design water levels. To address this rise in water surface elevation, the Project would improve the Lynwood Basin Levee and Novato Creek Left Bank Levee upstream of SR-37 adjacent to Farmers Basin by raising the levee elevations to provide adequate flood protection and freeboard and rebuild portions of the Lynwood Levee to meet design standards for stability and seepage.

Over time, as the existing Novato Creek channel scours and expands in response to the increased tidal prism resulting from the Project, the design water levels would drop along developed areas upstream of the Project site. Just upstream of the SR 37 crossing, the increase in the design water level would be reduced. Caltrans and the Metropolitan Transportation Commission are currently considering improvements to the SR 37 crossing, potentially also including the existing railroad crossing, that are anticipated to address the conveyance limitations at these crossings. Additionally, restoration of Deer Island Basin South, as described below, results in a significant decrease in design water levels along Novato Creek including just upstream of the SR 37 crossing. Overall, the deepening and widening of Novato Creek, due to the increased tidal conveyance of the Project, would improve flood protection in the Baylands and the city of Novato over time.

Lynwood Levee Ecotone and Flood Protection Improvements

The Lynnwood Levee would be modified to improve habitat, resiliency to climate change, and flood protection. As described below, modifications include creation of ecotone habitat along the Bird Ponds, raising the levee in low areas, and degrade/rebuild of the levee core for stability and seepage improvements.

Ecotone slopes constructed along the Lynwood Levee would provide important high tide refuge habitat, resiliency to sea level rise, and aid in flood protection (see below) while protecting the levee from erosion. Ecotone levees are proposed along the Lynwood Levee spanning 1,900 feet in Duck Bill Pond and 3,600 feet in Heron's Beak Pond. The ecotone slopes are intended to:

- Protect the levee from wind wave and velocity induced erosion, to limit the need for rock rip-rap protection.
- Support a mix of mid to high marsh plant communities transitioning to uplands at the levee, to provide high tide refugia for special status species.
- Improve stability of the existing levee by functioning as stability berms and limiting seepage.
- Provide transgression space for the marsh to move upslope with sea level rise.

Hydraulic modeling for the flood protection design storm[6] was completed for existing and immediate post-restoration conditions, in which no sediment accretion has occurred

[6] The modeled design scenario was a 50-year storm event coinciding with an annual high tide event.

within the Bird Ponds and no scour has yet occurred along Novato Creek. Along the lowest portions of the Lynwood Levee both existing and immediate post project water levels exceed the existing levee top. To address the rise in water surface elevation, the levee top would be raised along existing low areas spanning the southern 1,900 feet of the Lynwood Levee. The levee raise would generally be less than 2.0 feet total, except at the south end where the levee would be raised by up to 3.0 feet where it ends at the existing SR 37 bridge abutment/sheet pile cut off wall.

Levee Stability and Seepage Improvements

All of Lynwood Levee would be modified to improve levee stability and reduce seepage potential. To improve levee stability, the Lynwood Basin side of the levee would be rebuilt at a flatter side slope as compared to the existing slope. To reduce seepage, the upper portions of the Lynwood Levee would be excavated and rebuilt with compacted levee fill and either rock drainage layer would be installed along the Lynwood Basin side toe or a buried cutoff wall/trench installed through the middle of the levee.

Material to create the ecotone slopes and to raise and improve stability and reduce seepage along Lynwood Levee would be generated from Novato Creek channel widening, Novato Creek levee lowering, and excavation of material from within the Bird Ponds or beneficial reuse of dredge sediments from the Novato Creek Dredging Project occurring within the Project site[7].

Farmers Novato Creek Left Bank Levee

Similar to the Lynwood Levee, the Novato Creek Left Bank Levee upstream of SR 37 would be raised by up along Farmers Basin. The levee would be raised for a distance of about 2,100 feet, from just upstream of the SR 37 crossing to the existing Deer Island Cross Levee. Material for this improvement would be generated from excavation within Farmers Basin.

Utility and Infrastructure Protection

Improvements to Lynwood Levee (see Flood Protection above) would protect the Lynwood Basin from overtopping along Novato Creek. This would increase protection of existing PG&E transmission towers in Lynwood Basin, SMART rail, and adjacent shopping plaza.

Resiliency to Future Conditions

The broad, flat ecotone slope along the Bird Ponds side of Lynwood Levee would provide marsh transgression space under future sea level rise conditions. Additionally, the Bird Ponds restoration would result in a significant reduction in water levels along developed areas upstream of the Project site.

[7] The existing Novato Creek dredging activities were evaluated in the CEQA documents discussed above under Previous Studies and Environmental Review. The evaluations included the use of dredged material from Novato Creek for wetland restoration or flood control in projects, such as this Project.

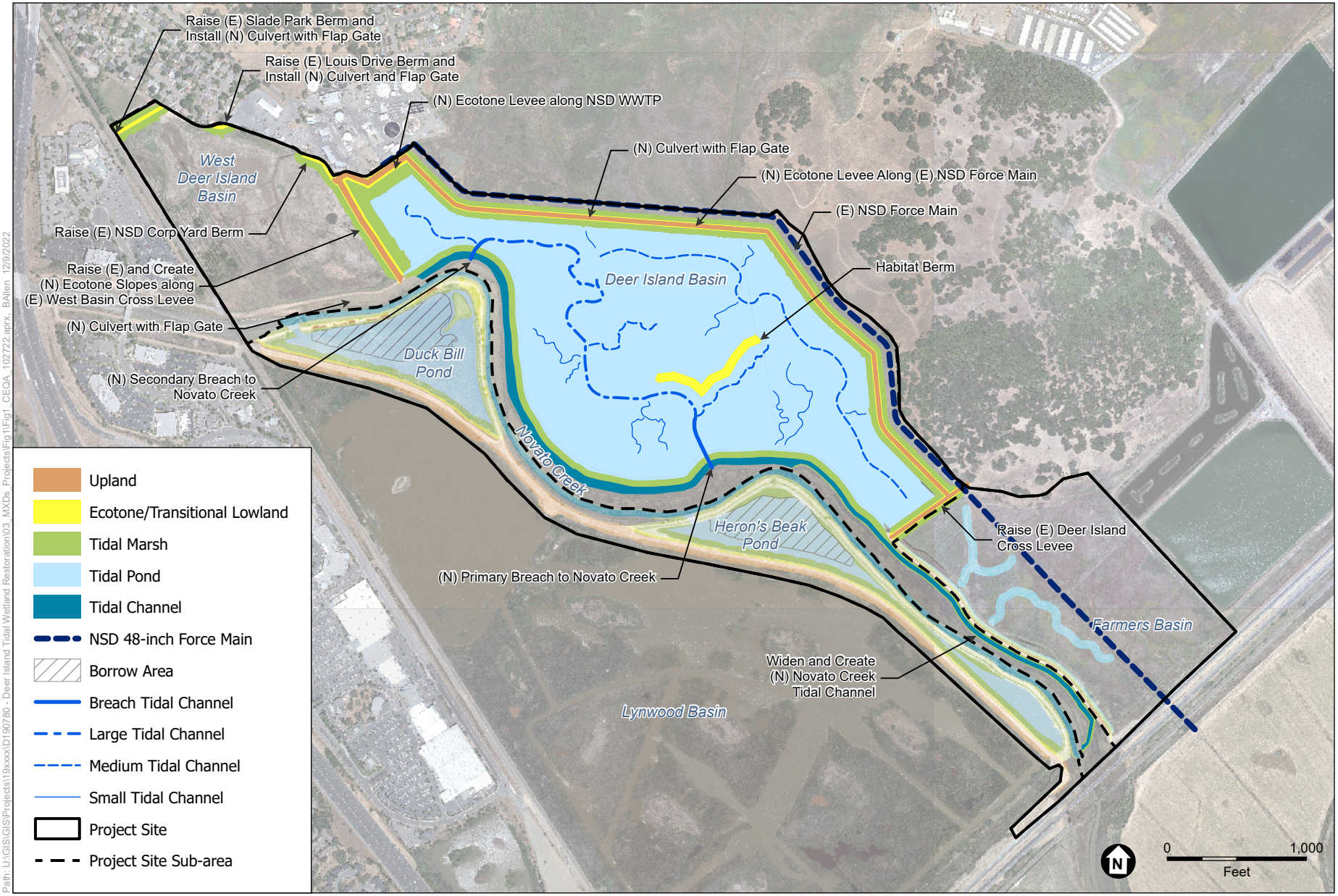
To help improve existing and future flood resiliency, the Lynwood Levee would receive a number of improvements: lower portions of the levee near SR 37 would be raised to decrease flood risk to Lynwood Basin and SR 37; construction of a wide, flat ecotone slopes along the Bird Pond side of the levee would limit wind wave erosion and the need to install rock rip-rap slope protection; and improvements to the Lynwood Basin side of the levees to bring the levees up to current geotechnical seepage and stability standards. To verify these improvements, hydraulic modeling was also completed to evaluate future conditions, assuming a quasi-equilibrium accretion elevation based on long term marsh elevation monitoring data for the Sonoma Baylands tidal marsh restoration project (ESA PWA 2014) and a 1.9-ft increase in sea-level, corresponding to the medium-high risk aversion, high emission projection for 2050 and the low risk aversion, high emission projection for 2070 as documented by the California Ocean Protection Council (OPC 2018). The modeling showed the Project decreases water surface elevations due to an increased flow conveyance from the expanded Novato Creek, thus providing resiliency to future conditions.

Deer Island Basin South

Deer Island Basin South would restore approximately 131 acres of diked former tide lands, including 109 acres of tidal channel, pond and wetland, 13 acres of lowland and transitional habitat, and up to 9 acres of uplands. Deer Island Basin South would be restored first by breaching and lowering the existing left bank levees along Novato Creek to restore tidal connectivity to Deer Island Basin (**Figure 7**). The existing Novato Creek Left Bank Levee upstream of SR 37 would be lowered between the Deer Island Cross levee and the West Basin Cross Levee to adjacent grades to create predominantly mid to high marsh habitat similar to that found within the Novato Creek corridor marshplain. Novato Creek would be widened, creating new and/or expanded tidal channel while also providing material to construct ecotone slopes along newly created berms and levees in the basin interior. Flood protection for the NSD pipelines buried within the northern portion of the basin would be provided by creating a new interim levee along the force main, dividing the basin roughly in half. Improved flood protection would also be provided to areas adjacent to the basin, including the NSD RWF and Farmers Basin. The West Deer Island Basin would remain a stormwater detention basin, with improved flood protection to Slade Park and Louis Drive and a new culvert and flap gate installed along Novato Creek to improve basin drainage post storm events.

Habitat Restoration

Restoration of the Deer Island Basin South involves creating and enhancing creek channel, tidal wetland and open water, and adjacent terrestrial lowland and upland habitat, to support a diversity of plant communities and wildlife species. Each proposed habitat element is described below and shown in Figure 4.



SOURCE: Marin Map, 2014; ESA, 2022

Deer Island Basin Complex Tidal Wetland Restoration

Figure 7
Deer Island Basin South Restoration Plan

ESA

Novato Creek Channel

Similar to the Bird Ponds, the Novato Creek channel would be enhanced by both widening the creek channel in areas where the existing channel is immediately adjacent to Deer Island Basin and the Novato Creek Left Bank Levee and creating new side channels to the main channel in areas where the existing channel is further from the basin and levees. This widening and side channel creation would increase the hydraulic conveyance capacity of the creek and accelerate the channel evolution post restoration. Material excavated from the channel would be beneficially reused as marsh topsoil for ecotone slopes to be placed along the lowered Novato Creek Left Bank Levee upstream of SR-37 and new habitat berms and levees in the Deer Island Basin South.

Excavation within the floodplain would occur within a 50-foot corridor along the creek side of the existing levee. The excavation would widen the existing Novato Creek channel from the upstream extent of the basin to just upstream of the Deer Island Cross Levee. Along Farmers Basin to the SR 37 crossing, excavation would create a side channel to the main stem of Novato Creek.

The restored tidal channel habitat in Novato Creek would support habitat for a variety of species as described under the Habitat Restoration section for the Bird Ponds portion of this Project.

Tidal Wetland and Open Water

Tidal wetland and open water habitat would be restored within Deer Island Basin South by lowering the existing Novato Creek Left Bank Levee to tidal wetland elevation, creating new tidal wetlands along the existing West Basin and Deer Island Cross Levees and new NSD Force Main levee by using material excavated from the existing levees and floodplain to gently sloped areas at tidal wetland elevations, and breaching the existing Novato Creek Left Bank Levee to re-introduce tidal hydraulic connectivity.

Tidal wetland habitat would be created on the Novato Creek Left Bank Levee by lowering the levees to high to mid-marsh elevations, providing a more contiguous connection between the existing marsh habitat along the Novato Creek channel and the restored basin. The levee would be lowered to variable elevations for topographic complexity to provide high tide refuge for special status species while maintaining elevations that would minimize colonization by invasive upland vegetation. Since high tide refugia habitat does not readily develop through natural processes, which would become more problematic with sea level rise, the intent is to maintain some portions of the levee at elevations that are as high as possible while still supporting native high-marsh vegetation. The levee (and breaching) lowering would also reduce terrestrial predator access to the marsh interior. Levee lowering also includes over-excavating the existing levee below design grade and placing a 1foot thick layer of topsoil, excavated as part of the Novato Creek Channel enhancements described above, to help support native marsh plantings. Beneficially reusing top soil from the adjacent floodplain is expected to support rapid re-establishment of a similar plant community on the lowered levees directly adjacent to the floodplain. Between the West Basin Cross Levee and the

Deer Island Cross Levee, 4,900 linear feet of levee lowering is proposed. The material excavated to lower the existing levee would be used as core material for new and improved levees and berms to be constructed in West Deer Island Basin, fronting the NSD RWF, and to protect the NSD force main. Dredge sediments that meet sediment quality requirements may be brought in to raise basin elevations to allow for accelerated restoration of the Basin to tidal marsh elevations.

Tidal wetland habitat would also be created on the West Basin and Deer Island Cross Levees and the new NSD Force Main Levee as part of the new levee ecotones. The levee ecotones range in elevation and provide a variety of habitats including uplands, transitional lowlands, high to low marsh, mudflat and sub-tidal. High to mid-marsh habitat would be created along gentle slopes between EL 7.0 feet and 5.0 feet while low marsh, mudflat, and subtidal habitats would be created along slightly steeper slopes between EL 5.0 feet to the pond bottoms (roughly EL -2.0 feet).

A restored dendritic tidal channel network would be created by over-excavating the remnant channel network to reestablish historic geomorphology, where possible, while providing material for levee construction. The tidal channel planform layout (e.g., channel length per marsh area, branching patterns, and sinuosity) were based on reoccupying significant portions of the remnant tidal channel network within the basin. Channel sizing (cross-section dimensions) was determined using tidal-prism-based hydraulic geometry relationships as a minimum and increased to provide adequate fill for construction of new levees and channel berms.

Material excavated from interior tidal channels would be used as fill onsite for marsh habitat berms and for levee construction. Habitat berms would be located at channel confluences and block existing straight channels that were presumably created to drain marshlands for prior land uses. Additionally, the habitat berms would block wind waves, helping to create more quiescent conditions to encourage sedimentation. Habitat berm crest elevations would vary with a maximum elevation of 8.0 feet.

Two breaches would connect Deer Island Basin South to Novato Creek. Breaches would be located at key locations to connect to historic tidal channels, to maximize sediment capture, and to provide alternative flow through paths for flood flows on Novato Creek. The primary levee breach would be located where the historic tidal channel network connected to Novato Creek approximately 3,600 feet northwest of the SR 37 crossing. Another key breach would be located on an outside bend of a meander in the creek channel approximately 1,800 feet east of the SMART rail bridge. This breach would be optimized for the capture of fluvial sediment from Novato Creek and to provide an additional flow path for flood flows on Novato Creek. The Deer Island Basin South restoration would also include an overflow notch just upstream of the Deer Island Cross Levee.

The remaining areas of the basin, consisting in the existing conditions of seasonal and alkali wetlands, non-tidal ponds, and non-native grasslands would be converted to tidal open water. Immediately post-restoration, the tide range in the basin would be about

0.5 foot, which is muted as compared to the roughly 6-foot tide range at the mouth of Novato Creek and the 2-foot tide range anticipated in the Bird Ponds immediately post-restoration. As Novato Creek channel increases in size in response to the increased tidal prism created by the restored basin, the tidal range of the restored tidal open water would also increase. In addition, the area of tidal open water would also evolve as the basin bottom elevations increase as sediment from Novato Creek accretes, with tidal open water habitat gradually (likely over 10 to 20 years) converting to tidal wetland habitat.

The tidal wetlands and open water would provide habitat for a variety of different species. The muted tidal ponds would provide habitat for fish and waterbirds. Tidal marsh vegetation provides nesting and foraging opportunities and cover for both ducks and shorebirds, as well as providing habitat for special status species such as California Ridgway's rail and California black rail. High marsh habitat would also support small mammals, such as the salt marsh harvest mouse, providing cover and available flood refuge habitat.

Transitional Lowland

Transitional lowland habitat would be created as part of the construction of new levee ecotones along the West Basin and Deer Island Cross Levees and the NSD Force Main Levee (see Construction Activities and Phases). The transitional lowland habitats would include lowland native grassland and seasonal wetlands and would be successional habitat, gradually converting to tidal marsh with sea level rise.

Upland

Upland habitat would be restored and created as part of the construction of the West Basin and Deer Island Cross Levees and the NSD Force Main Levee (see Construction Activities and Phases). Upland areas adjacent to wetland areas provide habitat for lizards, snakes, small mammals, and birds, such as the western fence lizard, gopher snake, western harvest mouse, and western meadowlark.

Flood Protection

Deer Island Basin Levees

Restoring hydraulic connection between Novato Creek and Deer Island Basin South requires improvements to West Deer Island Basin (described in the subsection below), the Deer Island Cross Levee, and construction of a new set back levee to replace the function of the existing Novato Creek Left Bank Levee upstream of SR-37, which protects adjacent properties and infrastructure from flooding. The new and improved levees would provide the SMART rail line, West Deer Island Basin, Slade Park and the adjacent residential areas, and City of Novato Public Works Yard/NSD RWF and the various NSD pipelines with the current levels of flood protection currently provided by the Novato Creek Left Bank Levee.

A flood protection levee that incorporates horizontal levee/ecotone slopes is proposed along the West Basin Cross Levee and fronting the NSD RWF to provide flood

protection to the NSD plant and the Slade Park neighborhood and SMART Rail that surround the West Deer Island Basin. The levees would include a conventional levee core constructed of onsite materials excavated from the existing Novato Creek Left Bank Levee upstream of SR 37 and channels excavated onsite. The levee core would have a crest width of 20 feet and space behind the levee to allow for the levee to be raised incrementally to accommodate 1.9 feet of sea level rise.

A horizontal levee is a variation of an ecotone slope that incorporates the discharge of treated wastewater along the top of the ecotone to irrigate native vegetation while also polishing wastewater effluent. NSD has recently upgraded the RWF to incorporate a highly effective nutrient removal process, so while the wastewater polishing function of the horizontal levee is not a priority for this Project, the treated wastewater could be utilized as an irrigation source for the proposed native revegetation. The target vegetation consists of native grassy wet meadow and riparian scrub species with freshwater/brackish marsh forming at the levee toe and along lower slopes/swales. An ecotone slope also contributes to flood management by attenuating waves, allowing for flood control levees to be constructed with crest elevations lower than conventional levees. Additionally, the ecotone slope provides wind-wave erosion protection, limiting the need for riprap (rock) protection on the levee face. By encouraging sediment and biomass accretion, the vegetation supported on the ecotone can build the ground surface elevation, contributing sea-level rise resilience to both the habitat and flood management/wave attenuation functions. Placement of riprap or other natural erosion reduction measures may need to be installed depending on the level of wind-wave erosion on the proposed levee.

A new levee would be constructed south of the NSD Force Main, splitting the full Deer Island Basin roughly in half. The northern half of the basin would remain non-tidal and continue to provide flood detention for runoff from adjacent areas. The new NSD Force Main Levee would connect to the Ecotone/Horizontal Levee at the NSD RWF, which would be aligned south of the NSD Force Main and connect to the Deer Island Cross Levee, totaling approximately 5,100 feet. The new levee would protect the NSD infrastructure, including the 48-inch force main, the 4- to 6-inch sludge line, and a smaller 12-inch force main. The levee crest would be 14.5 feet with a top width of 12 feet to allow vehicular access for inspection and maintenance of the infrastructure, as needed.

The Deer Island Cross Levee would be raised and improved with stability berms on both sides of the levee along the 540-foot length between the new NSD Force Main Levee and existing Novato Creek Left Bank Levee. The levee would allow the Farmers Basin to continue to provide critical flood detention capacity to protect adjacent properties and SR 37 from flooding, while facilitating restoration of Deer Island Basin South. The Deer Island Cross Levee crest would be 14.0 feet, while the NSD Force Main Levee crest would be 14.5 feet. Each levee would have a top width of 12 feet to allow vehicular access for inspection and maintenance and access to the remaining Novato Creek Left Bank Levee upstream of SR 37.

West Deer Island Basin Improvements

West Deer Island Basin provides flood detention for the Novato Creek drainage area, with overland flow from the neighborhoods to the north and culvert flow under the SMART rail line from areas to the west, as well as intentional spillover from Novato Creek over the Novato Left Bank Levee just downstream of the SMART tracks. A culvert runs under West Basin Cross Levee allowing overflow into Deer Island Basin. An erodible weir was constructed in 2015 in the Novato Creek levee adjacent to the basin to allow for controlled overtopping of Novato Creek to the basin. As part of the Deer Island Basin South restoration, the flood detention function of West Deer Island Basin would be improved by raising perimeter berms adjacent to Slade Park, Louis Drive, and the City of Novato Corporate Yard. The proposed berms are comprised of combinations of two components: a berm core to provide flood protection and ecotone slopes to protect the core from erosion while providing habitat. The crests of the berms would be 10.0 feet, with a top width of 15 feet, and provide flood protection for the 10-year storm event with freeboard. Additionally, the improved West Basin Cross Levee would be 14.5 feet and 13.5 feet along remaining Novato Left Bank Levee. The West Basin Cross Levee would also include an ecotone slope extending into the West Deer Island Basin that serves as a stability berm while protecting the levee core from erosion. New culverts would also be installed in the Louis Drive Berm, Slade Park Berm, and Left Bank Novato Creek Levee to maintain existing drainage corridors into the basin.

Utility and Infrastructure Protection

Deer Island Basin, as a whole, is typically inundated during the rainy season and dries out during the summers. The existing levees along Novato Creek protect infrastructure within and surrounding Deer Island Basin from inundation caused by extreme rainfall-runoff events and/or tidal water levels. Specifically, Deer Island Basin South protects and/or provides access to the following utilities and infrastructure from/during tidal inundation:

- There are two existing PG&E towers within the basin that are inundated by direct rainfall and stormwater inflow from adjacent properties during the rainy season. Ground access to the towers within the basin is currently possible on foot, as well as with low ground pressure off road vehicles during dry summer months with special permits for access into special status species habitat. Roadway driving access to the transmission tower nearest the levee would not be possible via the levee after restoration as the tower is located between the two proposed breaches and the levee is proposed to be lowered to create lowland. The Project would include a wooden pedestrian boardwalk from Deer Island to each tower similar to those installed by PG&E in wetlands throughout the Bay Area. Because of the sensitive nature of the area, no roadway access is proposed.
- SMART Rail and City of Novato Public Works Yard would be protected to by the improved West Basin Cross Levee (discussed in the preceding section).
- NSD RWF is protected by a new perimeter levee fronting the plant. The force main and other pipelines would be protected by the temporary levees across Deer Island Basin South (discussed in the preceding section).

- SR 37 is protected by the improved Deer Island Cross Levee (discussed in the preceding section).

Resiliency to Future Conditions

Flood protection levees throughout Deer Island Basin would include broad flat ecotone slopes that can provide marsh transgression space with future sea level rise. Additionally, proposed levees along the north and east basin are wide-crested to allow for future levee raising if needed to maintain flood protection with sea level rise. Finally, the Project would provide for natural scour and widening of the Novato Creek channel following implementation; as the conveyance capacity of the creek increases, design water levels along the creek would decrease significantly, making the creek corridor more resilient to future sea level rise. Hydraulic modeling was also completed for future conditions, assuming a quasi-equilibrium accretion elevation based on long term marsh elevation monitoring data for the Sonoma Baylands tidal marsh restoration project (ESA PWA 2014) and a 1.9-ft increase in sea-level, corresponding to the medium-high risk aversion, high emission projection for 2050 and the low risk aversion, high emission projection for 2070 as documented by the California Ocean Protection Council (OPC 2018). The modeling showed decreases in water surface elevations due to increased flow conveyance from the expanded Novato Creek, thus providing resiliency to future conditions.

Project Construction

This section provides discussion of key factors, including construction methods, descriptions of construction approach by area, and an inventory of equipment estimated to be used to complete Project construction of the Birds Ponds and Deer Island Basin South.

Construction Schedule and Sequencing

The available construction window for each phase of the Project is limited by the presence of protected species and sensitive habitats and by the potential for flooding within the Project site due to rainy season storms. Seasonal work windows related to special status species and the preferred construction season are shown in **Table 2** below; with green shaded months indicating when work is acceptable by species and orange shaded months indicating the preferred duration to allow flexibility in construction approaches and to minimize costs. To avoid disturbing special status wildlife species, including California Ridgway's Rail, California Black Rail, and nesting birds, Project construction could be limited to September 1–January 30 (non-breeding season). To minimize impacts to special status fish species, in water work could be further limited to September 1–November 30.

TABLE 2
SEASONAL WORK WINDOWS FOR SPECIAL STATUS SPECIES

	January	February	March	April	May	June	July	August	September	October	November	December
Ridgway's and Black Rails	● ●								● ●	● ●	● ●	● ●
Nesting birds	● ●	●						●	● ●	● ●	● ●	● ●
Steelhead						● ●	● ●	● ●	● ●	● ●	● ●	
Longfin smelt									● ●	● ●	● ●	
Preferred Construction Season	● ●				● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●

Recent protocol level surveys for Ridgway's and California Black Rail conducted along the Novato Creek to support the 2020 dredge of Novato Creek upstream of the Project site and dredge material placement at Heron's Beak Pond did not detect either Ridgway's or California Black Rail in the vicinity of the project site. In order to potentially extend the construction window, approved protocol level surveys for Ridgway's and California Black Rails could be initiated between January 15 and February 1 and continue through the end of March or mid-April ahead of construction. If no rails are detected, construction could be initiated as early as May (assuming no other nesting birds are found within the Project Site). If rails are detected, further coordination would be needed with the regulatory agencies to determine buffer requirements.

Construction of Duck Bill and Heron's Beak Ponds is anticipated to occur over two construction seasons due to the time required to dewater and dry the ponds to conditions that would support construction of the ecotone slopes and the time required to dry material excavated from the Novato Creek marshplain. For purposes of this CEQA analysis, it is assumed that site preparation for the Bird Ponds Restoration would begin May 1, 2024, and conclude September 15, 2025, assuming that grant funding can be obtained. Daily work hours would be 7 a.m. to 6 p.m.

Implementation of Deer Island Basin South is assumed to follow the Bird Ponds. Like the Bird Ponds, construction for Deer Island Basin South is anticipated to occur over two construction seasons. For the purposes of this analysis, pursuant to CEQA, work in Deer Island Basin South is assumed to occur in years 2026 and 2027.

Construction Equipment and Workforce

Project Equipment

Equipment anticipated for construction includes: mowers, long and short reach excavators, bulldozers/graders, wheel dump trucks, low ground pressure track dump trucks, track pulled scrapers, conventional big wheel scrapers, water trucks, pumps, rollers, sheepsfoot compactor, cranes, and concrete mixers. **Tables 3A and 3B** provide a summary of equipment to be used for construction of the Project components.

TABLE 3A
CONSTRUCTION EQUIPMENT – BIRD PONDS RESTORATION

Construction Activity	Equipment	Description
Season One (2024)		
Site Preparation	1 Mower 1 Bulldozer 1 Dump Truck 1 LGP Track Dump Truck	Clear vegetation from excavation and fill areas (Novato Creek Channel, Bird Ponds, Lynwood Levee, Novato Creek Left Bank Levee), haul vegetation to place at Lynwood Levee ecotone and/or export
	Hand tools (motorized or manual)	Remove vegetation in sensitive habitats, install exclusion fencing
	1 1.5-ton Flatbed Truck	Delivery of environmental control fencing
Novato Creek Channel Excavation	1 Excavator 3 LGP Dump Trucks 1 Bulldozer/Grader 1 Discer 1 Compactor	Excavate Novato Channel soil, place/dry along levees/ecotones, compact as moisture condition allows
Bird Ponds Excavation	1 Excavator 3 LGP Dump Trucks 1 Bulldozer/Grader 1 Discer	Excavate Bird Pond material, place/dry along Lynwood Levee/ecotone
Lynwood Levee Improvements	1 Excavator 1 LGP Dump Truck 1 Bulldozer/Grader 1 Compactor	Excavate and rebuild Lynwood Levee, install seepage improvements
Novato Creek Left Bank Levee – Farmers Basin	1 Excavator 1 LGP Dump Truck	Foundation excavation and subgrade preparation for Novato Creek Left Bank levee raise
	1 Excavator 2 LGP Dump Trucks 1 Bulldozer/Grader 1 Compactor 1 Water Truck	Excavate material from Farmers Basin and raise Novato Creek Left Bank Levee (local cut and fill)
Season Two (2025)		
Site Preparation	1 Mower 1 Bulldozer 1 LGP Dump Truck 1 LGP Track Dump Truck	Clear vegetation from excavation and fill areas (Duck Bill and Heron's Beak Levees), haul vegetation to place at ecotone slopes and/or export
Duck Bill and Heron's Beak Levee Excavation	1 Excavator 3 LGP Dump Trucks 1 Bulldozer/Graders	Excavate Duck Bill and Heron's Beak levees, haul material for placement along Lynwood Levee ecotone and levee core
Lynwood Levee Improvements	1 Excavator 3 LGP Dump Trucks 1 Bulldozer/Grader 1 Compactor 1 Water Truck	Grading and compaction of material placed along Lynwood levee and ecotone in Season 1; Placement, grading, and compaction of material excavated from Duck Bill and Heron's Beaks Levees in Season 2
	1 Discer 1 Hydroseeder	Revegetation

TABLE 3A (CONTINUED)
CONSTRUCTION EQUIPMENT – BIRD PONDS RESTORATION

Construction Activity	Equipment	Description
Season Two (2025) (cont.)		
Lynwood Levee Improvements (cont.)	1 Bulldozer 1 LGP Dump Truck 1 10-ton Roller	Aggregate base surface on levees
Duck Bill and Heron's Break Breaches/ Connector Channels	1 Excavator 2 LGP Dump Trucks 1 Bulldozer/Grader	Excavate breaches and channels

TABLE 3B
CONSTRUCTION EQUIPMENT – DEER ISLAND BASIN SOUTH RESTORATION

Construction Activity	Equipment	Description
Season One (2026 assumed)		
Site Preparation	1 Mover 1 Bulldozer 1 LGP Dump Trick 1 LGP Track Dump Truck	Clear vegetation from excavation and fill areas (Novato Creek Channel, Deer Island Basin South, Novato Creek Left Bank Levee), haul vegetation to place at new levee ecotone slopes and/or export
	Hand tools (motorized or manual)	Remove vegetation in sensitive habitats, install exclusion fencing
	1 1.5-ton Flatbed Truck	Delivery of environmental control fencing
Novato Creek Channel Excavation	2 Excavators 4 LGP Dump Trucks	Excavate Novato Channel soil, haul to levees/berm fill placement areas
Deer Island Basin South Interior Tidal Channel Excavation	1 Excavator 3 LGP Dump Trucks 1 Bulldozer/Grader	Excavate tidal channels topsoil and haul to stockpile location
	1 Excavator 3 LGP Dump Trucks 1 Bulldozer/Grader 1 Discer 1 Compactor	Excavate tidal channels soil, haul to levees/berm placement areas
New NSD Force Main Levee New NSD WWTP Levee New Slade Park Berm New Louis Drive Berm West Deer Island Cross Levee Deer Island Cross Levee	1 Excavator 2 LGP Dump Trucks 1 Bulldozer/Grader	Foundation excavation and subgrade preparation new and improved levees
	2 Discers 2 Compactors	Place/dry excavated material along new levee/improved berm footprints, compact and moisture condition
Winterize Project Site	1 1.5-ton Flatbed Truck	Deliver stormwater BMP materials

TABLE 3B (CONTINUED)
CONSTRUCTION EQUIPMENT – DEER ISLAND BASIN SOUTH RESTORATION

Construction Activity	Equipment	Description
Season Two (2027 assumed)		
New NSD Force Main Levee New NSD WWTP Levee New Slade Park Berm New Louis Drive Berm West Deer Island Cross Levee Deer Island Cross Levee	2 Excavators 5 LGP Dump Trucks 6 Bulldozer/Grader 2 Discers 2 Compactors 2 Water Trucks	Grading, moisture condition, compaction of excavated material from Seasons 1 & 2 along new levee/improved berm footprints, compact and moisture condition
Novato Creek Left Bank Levee Excavation	2 Excavators 4 LGP Dump Trucks	Excavate levee to marsh plain, haul to levees/berm placement areas
	1 Loader/Backhoe	Revegetation
New NSD RWF Levee	1 LGP Dump Truck 1 Front Loader	Horizontal levee subsurface layer (deliver and spread rock drain, 2-foot-thick sand filter, irrigation lines)
New Levee Surfacing	1 Bulldozer 1 LGP Dump Truck 1 10-ton Roller	AB surfaces on levees
Breaches and Tidal Connector Channel Excavation	1 Excavator 3 LGP Dump Trucks	Excavate breaches and channels
Revegetation	1 Discer 1 Hydroseeder	Revegetation
Water Control Structures	1 Concrete Pump Truck 1 Crane (small) 1 Delivery Truck (large)	Construct headwalls, pipe culverts, with flap gates, and gate wells with slide gates
Boardwalk	1 1.5-ton Flatbed Truck 2 Crews	Construct boardwalk

Vehicle Trips

Construction truck traffic for large equipment deliveries and material deliveries would likely access the Project site via the existing access point along SR 37. On-site access routes and parking would be limited to the Project footprint. Access to West Deer Island Basin would be provided through the City of Novato Corporation Yard and Slade Park. Haul routes within the Project site would utilize the existing levee alignments. Two-way traffic along the existing levee alignments would be limited by the width of the levee crests and movement of materials may require a circular haul path.

Workforce

Assuming there would be [an average of] 1.5 workers for each piece of equipment, it was estimated that a minimum of 6 workers and a maximum of 53 workers would be at the Project site at any given time for overlapping construction activities. It was estimated that there would be 272 workers total required for season one and 159 workers total required

for season two. In addition to the construction truck trips, there would be worker vehicle trips to and from the Project construction site during Project construction. Assuming that half of these workers would be carpooling, a maximum of approximately 80 trips to and from the Project construction site would occur during Project construction on any given day.

Earthwork Volumes

Preliminary earthwork volumes for the Project are provided in **Table 4** to calculate truck trips. Assumed losses are based on observed losses during construction of projects in similar environments. Volumes do not include an allowance for potential levee settlement beyond the settlement that occurs during construction of levees and berms that is covered in the assumed losses. Assuming a 12 CY truck at 144 CY/day there would be 12 trips per day per truck. It is assumed that all excavated material would serve as fill material and there would be no off-hauling outside of the Project site.

TABLE 4
ESTIMATED SOIL VOLUMES (IN CY)

Item	Quantity	Losses (%)	Available for Fill	Total
Duck Bill and Heron's Beak Ponds				
Novato Creek Marshplain Excavation	113,900	Varies	72,600	
Levee Excavation	82,300	20%	65,800	
Breach Excavation	9,900	40%	5,900	196,700
Farmers Basin Borrow	23,000	40%	13,800	
Bird Ponds Borrow	64,300	40%	38,600	
Levee and Ecotone Fill	169,900			
Duck Bill Pond Ecotone	*27,300*			
Heron's Beak Pond Ecotone	*36,500*			173,400
Lynwood Levee	*96,100*			
Deer Island Cross Levee	*13,500*			
Deer Island Basin South				
Novato Creek Marshplain Excavation	149,400	40%	89,600	
Interior Channel Excavation	149,100	40%	89,500	
Levee Excavation	52,600	35%	34,200	251,000
Breach Excavation	20,300	40%	12,200	
Subgrade Excavation	42,500	40%	25,500	
Levee and Ecotone Fill	215,800			
NSD Force Main	*149,200*			
NSD WRF and Novato Corp Yard	*19,600*			
West Deer Island Basin	*29,700*			239,800
Deer Island Cross Levee	*13,500*			
Slade Park	*2,800*			
Louis Drive	*1,000*			
Habitat Berm Fill	24,000			

NOTES: Blue shading = excavation volume; Red shading = fill volume

Pre-Construction Preparation

Site Preparation

Site preparation for Duck Bill and Heron's Beak ponds includes dewatering the ponds, clearing and grubbing the Novato Creek marshplain excavation area in phase, and installation of wildlife exclusion fencing to isolate the work area from adjacent habitat as needed. Material generated during clearing and grubbing would be buried within the ecotone subgrade onsite or disposed of in an offsite location.

Site preparation of Deer Island Basin includes clearing and grubbing the marshplain excavation area along Novato Creek and the tidal channel excavation area within the basin and installation of wildlife exclusion fencing to isolate the work area from adjacent habitat as needed. Clearing of vegetated areas would be performed in a phased manner to allow for clearing and fencing of discrete work areas. Material generated during clearing and grubbing would be buried within the ecotone subgrade onsite or disposed of in an offsite location.

Staging Areas

On-site staging would be limited to within the Project footprint. Prior to construction, a site operations plan would be developed to identify the construction equipment staging and support areas, exclusion areas, limits of work, and parking areas.

Construction Activities and Phases

Bird Ponds Restoration

Construction Season One (2024)

Construction of the Project elements would begin with excavation to widen and enhance Novato Creek Channel, excavation within the Bird Ponds to generate ecotone and levee material, and excavation and fill placement needed for Lynwood Levee improvement.

Novato Creek Channel marshplain excavation would be accomplished using long-reach excavators positioned on the existing levees. Excavated material would be hauled to staging or final placement locations (i.e., Lynwood Levee) using dump trucks. Brackish and salt marsh topsoils would be sorted, spread, dried, and stockpiled for placement in the ecotone slopes. The remainder of the excavated material would be spread and disked weekly to dry the material to moisture conditions suitable for constructing the ecotone slope core, which could take as long as 16 to 20 weeks., depending on the weather conditions at the time of excavation. Depending on the conditions of ecotone slope footprint in the ponds, excavated material would either be placed within the fill footprint and pond bottom to be dried or on levee tops or in a staging area. As material reaches suitable moisture conditions, it would be placed in thin lifts and compacted to build up to design grades.

In areas where the marshplain excavation would be adjacent to the creek channel, a silt curtain would be installed to limit turbidity and sediment resulting from construction

activity and exclude fish from accessing the active construction area. The curtain would span the perimeter of the marshplain excavation and be at least 6 feet in height to maintain a fish barrier at high tide. The curtain would be a permeable filter fabric supported by a line of floats on the water surface and a line of weights on the channel bottom. Once excavation of the marshplain is complete, the silt curtain would be removed. Alternatively, the Novato Creek low flow channel may be blocked with a temporary earthen berm and flap-gated culvert to limit tidal inundation along the marshplain to allow work in relatively dry conditions. This would also provide an access corridor between the Bird Ponds and Farmers Basin.

Concurrent with the Novato Creek Channel work, material would be excavated from both Heron's Beak and Duck Bill ponds for use in levee improvements and ecotone slope creation. Sediment may be reused from dredge sediment from the Novato creek dredge planned for 2025. Material would be hauled, spread, and disked on site to achieve suitable moisture conditions as described above. Water control to facilitate pond bottom excavation would be implemented as needed by the contractor.

In parallel with the channel enhancement and pond bottom excavation, Lynwood Levee would be improved by removing the top portion of the levee, widening the levee base into the Lynwood Basin with flatter slopes along the basin, and rebuilding the levee to elevation with consideration of settlement, with an impermeable cutoff trench barrier or a subdrainage layer.

Concurrent with the work on the Bird Ponds, the Novato Creek Levee adjacent to the Farmers Basin would be raised from the Farmers Basin cross levee to SR 37. Material to raise the levee would be excavated from within Farmers Basin and placed on the levee as described above. For material used to raise the existing levee along Farmers Basin and the Lynwood Levee, fill material would be moisture conditioned to near optimum moisture content for construction of the raised levee core. Excess material generated for restoration of the Bird Ponds could also be used to raise the Novato Creek Levee, as appropriate, or stockpiled in Deer Island Basin for use by the District for maintenance or restoration provided the contractor can cross Novato Creek with the material to transport it to Deer Island.

At the end of construction season one and prior to the beginning of the rainy season, the project site would be stabilized for erosion and stormwater runoff, if a second construction season is required.

Construction Season Two (2025)

Construction season two would begin with compaction and grading of material excavated or reused in the previous season to complete the Lynwood Levee ecotone slopes. Concurrently with the construction of the ecotone slopes, lowering of the levee along Novato Creek would begin. Material excavated from the existing levee would be used to finish construction of the Lynwood Levee ecotone slopes and raise and improve stability of the levee in select locations. Material would be transported from the Heron's

Beak and Duck Bill Levees to the Lynwood Levee, where it would be placed, moisture conditioned, and compacted. Levee removal would be phased as described above to provide continuous flood protection.

Once Lynwood Levee and ecotone slope construction are complete, revegetation would begin. Revegetation would be accomplished using a combination of hydroseeding, drill seeding, plug planting, and transplanting of dormant sod fragments and/or discing of sod fragments into the finished grades. All seeds and plants would be from local sources/watershed when possible. Following revegetation, breaching of the Novato Creek Levees would occur once the ecotone slope is substantially complete, restoring tidal conditions to the Bird Ponds. Breach material may be used to complete the final lifts of the ecotone slope and/or placed within the interior of the ponds near the breach locations.

Deer Island South Basin Restoration

Construction Season One (Assumed 2026)

Construction of project elements would begin with excavation of the Novato Creek marshplain, including salvage and stockpiling of the brackish and salt marsh top soils and spreading and drying material for use in the ecotone slope core. In areas where the marshplain excavation is adjacent to the creek channel, either a silt curtain would be installed to contain turbidity and sediment resulting from construction activity. Alternatively, the Novato Creek low flow channel may be blocked with a berm and flap-gated culvert to limit tidal inundation along the marshplain to allow work in relatively dry conditions.

Tidal channels would be excavated within the diked basin and the excavated materials would be hauled to the new levee and berm locations in Deer Island South and West Basins or sidecast to create high marsh habitat berms. The upper 1 to 2 feet of material excavated from the interior tidal channels would be reserved for placement as marsh topsoil on habitat berms and ecotone slopes. Excavated material from the diked basin appropriate for structural fill would be used for construction of the new levee and berm cores. Excavated material from the diked basin not appropriate for structural fill would be used to construct ecotone slopes.

Material excavated from the marshplain and the basin interior would likely be too wet to meet moisture and compaction requirements for fill and would need to be spread and disked weekly to dry the material to suitable moisture conditions for levee core construction or suitable moisture conditions for construction of ecotone slopes, stability berms, and habitat berms. The drying time is assumed to take up to 16 to 20 weeks particularly for material used to construct the levee cores, depending on the weather conditions at the time of excavation. The material would be placed for drying within the footprints of the levee and berms to be constructed.

Depending on the condition of the excavated material, construction of the lower lifts of new levees and berms in Deer Island Basin South would begin in the first construction

season. As material reaches optimal or suitable moisture conditions, it would be placed in thin lifts and compacted to build up towards to design grades.

At the end of construction season one and prior to the beginning of the rainy season, the project site would be stabilized for erosion and stormwater runoff.

Construction Season Two (Assumed 2027)

Construction season two would continue construction of the various levees and berms in Deer Island South Basin (West Basin and NSD RWF ecotone levees, and NSD Force Main and Farmers Basin habitat levees) and West Basin (Slade Park, Louis Drive, and Novato Corporation Yard Berms), including the development of tidal lowland and upland habitats. Tidal channel excavation would continue and excavated material would be spread, moisture conditioned, and compacted to continue to build towards finished grades. Stockpiled brackish and salt marsh top soils would be placed at appropriate elevations along the new ecotone levees to support establishment of tidal marsh habitat. Along horizontal levees subsurface seepage layers consisting of a rock drain, sand filter, and top soil would be placed on the slopes along the NSD RWF ecotone levee and the Deer Island side of the West Basin ecotone levee allowing for irrigation with treated wastewater. Irrigation supply and distribution lines would also be installed along these portions of the levees.

Water control structures would be installed in the Louis Drive berm and NSD Force Main ecotone levee. The water control structures would allow drainage into the basins and will consist of upstream and downstream headwalls, pipe culverts with flap gates, and gatewells with slide gates. A water control structure would also be installed in the West Basin Novato Creek levee. Construction of the culvert would require that the area be isolated from Novato Creek, potentially by installing a temporary coffer dam on the Novato Creek side of the levee or using the existing marshplain as a coffer dam.

Lowering of the Novato Creek levee along Deer Island Basin would occur concurrently with the construction of the new levees and berms. Material excavated from the existing levee would be transported from the Novato Creek levee to new levee/berms locations where it would be placed, moisture conditioned and compacted to finish construction of the new berms and levees. Levee removal would be phased as described above to provide continuous flood protection.

In addition to the earthwork, a 3- to 6-foot-wide wooden boardwalk would be constructed from Deer Island Open Space Preserve along the PG&E transmission tower alignment to provide inspection access to the towers.

Once the levees, berms, and ecotone slopes are constructed, the revegetation work would commence. Revegetation would be accomplished using a combination of hydroseeding, drill seeding, plug planting, and transplanting of dormant sod fragments and/or discing of sod fragments into the finished grades. Following revegetation, the Novato Creek levees would be breached, restoring tidal conditions to Deer Island Basin

South. The breach material would be used for the final lifts along new levees and/or placed near breach locations. The new levees would be capped with an aggregate base surface.

Revegetation

Planting, seeding, and other revegetation techniques would be employed after grading to create a mosaic of locally native wetland, ecotone transition, and upland habitats to provide ecosystem functions. Revegetation efforts would focus on active planting and vegetation management in the high marsh, transitional and upland areas (above post restoration MHHW) along the lowered Duck Bill and Heron's Beak Levees and improved Lynwood Levee for the Bird Ponds and along the lowered Novato Creek levee and the new perimeter levees and habitat berms in both Deer Island Basin South and West Deer Island Basin. Limited revegetation efforts are planned for the tidally inundated areas of the Project site, as native tidal wetland plant communities are expected to establish through a combination of salvaging and reusing brackish and salt marsh top soils, including the native seedbank, and passive recolonization.

The revegetation strategy would incorporate selective grading practices during construction to scrape and bury topsoil containing invasive seedbank, as well as post-construction monitoring and adaptive management to control early-stage invasions by problematic weed species. Invasive, non-native plant species are present within all habitats on the Project site and on adjacent properties.

Operation and Maintenance

The Project has been designed to minimize the need for active operations and ongoing maintenance. The District would perform routine observation and maintenance to maintain flood protection facilities, including both the levees and the water control structures, along the Project reaches. Typical levee monitoring activities would include inspection for erosion or rodent damage along the levee tops and slopes. Typical levee maintenance activities include fire fuel reduction, mowing and weed control and repair of erosion sites. Typical water control structure monitoring and maintenance activities include inspection of the slide and flap gates for functionality and removal of any accumulated debris or sediment at the downstream end of the culverts to ensure proper drainage. The District would continue to observe geomorphic changes along Novato Creek in order to monitor the flood conveyance capacity of the creek channel. The District may perform localized dredging near the SMART bridge, if necessary, to provide appropriate flood protection to critical infrastructure.

Grant requirements and regulatory agency permits and approvals may require specific post-construction monitoring activities to be incorporated into the adaptive management aspects of the project's Monitoring and Adaptive Management Plan.

SECTION III
Circulation and Review

This Initial Study/Mitigated Negative Declaration is being circulated for a 30-day review and comment period pursuant to CEQA Guidelines Section 15073. It is being circulated to all agencies that have jurisdiction over the subject property or the natural resources affected by the project and to consultants, community groups, and interested parties to attest to the completeness and adequacy of the information contained in the Initial Study as it relates to the concerns which are germane to the agency's or organization's jurisdictional authority or to the interested parties' issues.

Marin County Agencies:

- Marin County Community Development Agency, Environmental Review
- Marin County Parks

Local, Federal, Trustee, and Responsible Agencies:

- National Marine Fisheries Services (NMFS)
- US Department of Fish and Wildlife (USFWS)
- US Army Corp of Engineers (USACE)
- California Department of Fish and Wildlife (CDFW)
- Regional Water Quality Control Board, Region 2 (RWQCB)
- Caltrans, Region 4
- State Lands Commission
- California Department of Water Resources
- California Department of Boating and Waterways
- North Marin Water District
- Novato Sanitary District
- Novato Fire District
- Novato Department of Public Works
- Novato Planning Division
- Novato Parks, Recreation, & Community Services
- Sonoma-Marin Area Rail Transit

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SECTION IV

Project-Related Approvals, Agreements, and Permits

- USACE, Section 404 Permit
  - USFWS Biological Assessment
  - NMFS Biological Assessment/Essential Fish Habitat Assessment
  - Section 106 State Historic Preservation Office Consultation
- RWQCB Section 401 Certification
- CDFW Section 1600 Lake and Streambed Alteration Agreement

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SECTION V

Documents Incorporated by Reference

Included at the end of this document.

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SECTION VI

Evaluation of Environmental Impacts and Mitigation Measures

Pursuant to Section 15063 of the State CEQA Guidelines, and the County EIR Guidelines, Marin County will prepare an Initial Study for all projects not categorically exempt from the requirements of CEQA. The Initial Study evaluation is a preliminary analysis of a project which provides the County with information to use as the basis for deciding whether to prepare an Environmental Impact Report (EIR) or Negative Declaration. The points enumerated below describe the primary procedural steps undertaken by the County in completing an Initial Study checklist evaluation and, in particular, the manner in which significant environmental effects of the project are made and recorded.

A. The determination of significant environmental effect is to be based on substantial evidence contained in the administrative record and the County's environmental data base consisting of factual information regarding environmental resources and environmental goals and policies relevant to Marin County. As a procedural device for reducing the size of the Initial Study document, relevant information sources cited and discussed in topical sections of the checklist evaluation are incorporated by reference into the checklist (e.g., general plans, zoning ordinances). Each of these information sources has been assigned a number which is shown in parenthesis following each topical question and which corresponds to a number on the data base source list provided herein as Attachment 1. See the sample question below. Other sources used or individuals contacted may also be cited in the discussion of topical issues where appropriate.

B. In general, a Negative Declaration shall be prepared for a project subject to CEQA when either the Initial Study demonstrates that there is no substantial evidence that the project may have one or more significant effects on the environment. A Negative Declaration shall also be prepared if the Initial Study identifies potentially significant effects, but revisions to the project made by or agreed to by the applicant prior to release of the Negative Declaration for public review would avoid or reduce such effects to a level of less than significance, and there is no substantial evidence before the Lead County Department that the project as revised will have a significant effect on the environment. A signature block is provided in Section VII of this Initial Study to verify that the project sponsor has agreed to incorporate mitigation measures into the project in conformance with this requirement.

C. All answers to the topical questions must take into account the whole of the action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts. Significant unavoidable cumulative impacts shall be identified in Section VI.21 of this Initial Study (Mandatory Findings of Significance).

D. A brief explanation shall be given for all answers except "Not Applicable" answers that are adequately supported by the information sources the Lead County Department cites in the parenthesis following each question. A "Not Applicable" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "Not Applicable" answer shall be discussed where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

E. "Less-than-Significant Impact" is appropriate if an effect is found to be less than significant based on the project as proposed and without the incorporation of mitigation measures recommended in the Initial Study.

F. "Potentially Significant Unless Mitigated" applies where the incorporation of recommended mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less-than-Significant Impact." The Lead County Department must describe the mitigation measures, and briefly explain how they reduce the effect to a less-than-significant level (mitigation measures from Section IV, "Earlier Analyses", may be cross-referenced).

G. "Significant Impact" is appropriate if an effect is significant or potentially significant, or if the Lead County Department lacks information to make a finding that the effect is less than significant. If there are one or more effects which have been determined to be significant and unavoidable, an EIR shall be required for the project.

H. The answers in this checklist have also considered the current State California Environmental Quality Act Guidelines and Appendix G contained in those Guidelines.

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.

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

Environmental Impact Checklist

1. Aesthetics

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

Environmental Setting

The study area for aesthetic resource impacts analysis includes the Project site and public areas from which proposed Project activities would be visible. The Project site offers notable views of Deer Island Open Space Preserve and Novato Creek, designated as a scenic resource in the City of Novato General Plan (City of Novato 2020).

The Project site is located in Novato, north of the State Route (SR) 37/US 101 interchange. The Project site is a non-urbanized area, generally characterized by flat topography with varying degrees of vegetation and exposed soil, marshes and adjacent creeks, lowland grasslands, earthen levees, and adjacent industrial infrastructure. Novato Creek, which flows east to San Pablo Bay, roughly bisects the Project site.

The Project site is situated on either side of Novato Creek, with a large concentration of green vegetation, mottled due to the variety of vegetation, and water surfaces that provide varied visual texture to the Project. It is generally level, with levees along Novato Creek adding elevated linear features to the immediate landscape. Public vantage points into the Project site include SR 37, Rowland Boulevard, SMART rail, Deer Island Open Space Preserve, and Slade Park. The visual character of the Project site and adjacent areas reflect the mix of open space, urban public utility, recreation, and residential land uses in the vicinity. As the photos demonstrate, the Project site is defined by the vivid colors of the vegetation, water surfaces and distant views of commercial, industrial, and residential areas. The visual quality of the Project site is moderate based on the of the Project site's appearance considered with the surrounding development.

The Project site is mostly surrounded by developed lands. It is bordered by commercial and office development, the NSD RWF, the City of Novato Corporation Yard, and the SMART rail line on the west, the northern half of Deer Island Basin and residential areas beyond along Olive Avenue to the north, Deer Island Open Space Preserve and SR 37 to the east, and the Lynwood Basin to the south. The commercial areas surrounding the site consist of single row clusters of one- and two-story businesses along Rowland Boulevard. Mature trees are present throughout the surrounding neighborhood alongside Lea Drive, including public sidewalk areas.

Discussion

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

No Impact. The Project is not located near a designated scenic vista (City of Novato 2020). The City of Novato's General Plan does not define scenic vistas within the city. Therefore, the Project would have no impact on a scenic vista.

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. The Project site is not located near any highways designated as scenic highway by the California Department of Transportation (Caltrans 2019). The closest eligible State scenic highway to the Project site is SR 37, located approximately 0.1 mile southeast of Heron's Beak Pond. Construction activities would be visible from SR 37. However, there are limited stationary public vantage points from SR 37; any views would be fleeting to motorists on this roadway. Upon completion of construction, the visual characteristics of the Project site would be restored. For this reason, the Project would have a less-than significant impact on scenic resources within view of a State scenic highway.

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

The City of Novato is an urbanized area, as defined in CEQA Guidelines Section 15387, and as mapped by the United States Census (USCB 2010). While the Project site is located in a non-urbanized part of the city, it is surrounded by this urbanized area. Therefore, this analysis of scenic quality will consider the city's governing General Plan policies, as applicable to the Project. The surrounding area is comprised generally of commercial and office development, and open space uses. The General Plan Land Use designation for the site is Open Space.

Policies in the city's General Plan have been adopted for the purpose of preserving, enhancing, and restoring natural areas and features, including Novato's scenic hillsides, waterways, riparian corridors, wetlands, Baylands, and special status species. The following policies are applicable to the Project.

City of Novato General Plan 2035 Policies Relevant to Aesthetics	
Policy ES 1	Preserve and enhance the ecology of creeks and streams, including riparian vegetation. Prohibit further degradation and require restoration of previously degraded riparian areas as a condition of development approval when restoration is feasible, taking into account the project's size and cumulative impacts.
Policy ES 4	Restore damaged portions of riparian areas to their natural state, including the removal of invasive species, whenever feasible.
Policy ES 6	Preserve and enhance wetlands ecology.
Policy ES 15	Protect visual values on hillsides, ridgelines, and other scenic resources. Development should be located and designed to protect views of important scenic resources identified on Figure ES-5.

Construction Impacts

Less-than-Significant Impact. Construction of the Project would include: equipment and material staging and laydown; site preparation, consisting of vegetation, excavation, and grading; construction of new levees; and landscape improvements by fine grading and revegetation. These activities would be visible at times to motorists traveling along SR 37, as well as motorists traveling along Rowland Boulevard. Visitors to Deer Island Open Space Preserve would see construction work while walking along trails, as would viewers in Slade Park. Workers at the southern end of the City of Novato Corporation Yard would also see construction work.

The Project site would have limited public viewpoints; most of these viewpoints would be from surrounding roadways and fleeting. Recreationalists in Deer Island Open Space Preserve and Slade Park would have more sustained views. Given the limited viewing opportunities, this would result in a small number of viewers.

Restoration of the Bird Ponds would occur over the course of two years, though construction would be limited by permit conditions for protected species and sensitive habitats, as well as by the potential for flooding during seasonal storms. Restoration of Deer Island Basin South is assumed to occur over the succeeding two-year period and have the same permit and weather imitations. Thus, construction aesthetic impacts would be limited to the seasonal permitted work windows and would likely not occur during the months of February through April. Staging areas would be limited to within the Project site. The construction equipment would be similar in character to equipment used at other industrial facilities in the vicinity.

These activities would have a temporary effect on views of landscape features (i.e., vegetated expanse, water features). Furthermore, views of the work would

be short-term, and indirect, as motorists would be traveling through the area with no established viewing locations along the road. Likewise, views from Deer Island Open Space Reserve and Slade Park would be temporary and visible only from certain vantage points.

While Project construction would create a substantial visual change at the Project site, the lack of sustained public views and viewers, the temporary nature of the construction activity, and the eventual restoration of the Project site to its preconstruction condition would not have a lasting negative effect on the Project site's scenic quality. Additionally, the purpose of the Project aligns with the city's General Plan policies listed above. Therefore, the Project's impact on the site's scenic quality would be less than significant.

Operational Impacts

Less-than-Significant Impact. Once completed, the Project would restore and enhance the area comprising the Bird Ponds and Deer Island Basin South. Over time, tidal pond habitat within the Bird Ponds is anticipated to evolve into a mosaic of tidal wetland and channel habitat. Open water habitat within Deer Island Basin South is anticipated to evolve to mudflat and ultimately tidal wetlands and channels in the long term. The Project has been designed to minimize the need for active operations and ongoing maintenance and would not have a lasting negative effect on the Project site's scenic quality. As noted above, Project aligns with the city's General Plan policies governing visual quality. Therefore, the impact 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?

Less-than-Significant Impact. Existing sources of light in the Project site are associated with the surrounding residential and commercial development and lighting from the City's corporation yard and the NSD RWF, and vehicle lights from SR 37 and Rowland Boulevard. Existing sources of glare are limited to light reflecting off vehicle surfaces (e.g., windshields) and reflective building surfaces around the periphery of the Project site. Existing visual receptors sensitive to light and glare in the Project site would primarily be surrounding residences near the Project site in direct view of any of the Project component sites.

The Project would not include nighttime construction and there would be no other lighting required during the construction phase. Upon completion of the Project's construction phase, there would be no permanent structures or facilities requiring lighting. Sources of glare would be limited to glass on construction equipment or delivery vehicles (e.g., windshields). With the movement of vehicles and variability of sky conditions, glare associated with Project construction would not be substantial during the daytime and would not occur at night. The required project materials for construction and operation would not be reflective and,

therefore, would not result in new sources of substantial glare. For these reasons, the Project would have less-than-significant impacts relative to light or glare.

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2. Agriculture and Forestry Resources

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

Discussion

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

No Impact. The California Department of Conservation Division of Land Resource Protection (CDC) Farmland Mapping and Monitoring Program illustrates the Project site as Other Land and Water Area, and the surrounding areas as Urban and Built-Up Land (CDC 2013). Therefore, there would be no impact to this resource.

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

No Impact. The Project site is zoned as Publicly Owned Open Space. Marin County GIS records show that the Project site is not a Williamson Act property (Marin County 2020). Therefore, there would be no impact on lands zoned for agricultural use or are committed through the Williamson Act program.

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))?

No Impact. The Project site is zoned as Publicly Owned Open Space and not located within an area designated by the City of Novato, Marin County, or the State as forest land or timberland. Therefore, there would be no impact on lands zoned for timber use or are committed timber production.

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

No Impact. The Project does not have forestland; therefore, there would be no impact under this criterion.

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?

No Impact. The Project proposes to restore Novato Creek, the Bird Ponds, and the southern portion of Deer Island Basin. The Project has no components that would cause direct or indirect development pressures in the Project site that would, in turn, result in the conversion of farmland or forestland to other uses. Therefore, there would be no impact.

3. Air Quality

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:	Significant or Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☒	☐	☐
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☒	☐	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☒	☐

Discussion

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

Less-than-Significant Impact with Mitigation Incorporated. The Project site is located within the San Francisco Bay Area Air Basin (SFBAAB), which is regulated by the Bay Area Air Quality Management District (BAAQMD). The SFBAAB is currently designated as a nonattainment area for the state and national ozone standards, state respirable and fine particulate matter (PM_{10} and $PM_{2.5}$) standards, and the federal $PM_{2.5}$ (24-hour) standard (BAAQMD 2017a). The most recently adopted air quality plan to address nonattainment issues in the SFBAAB is the 2017 Bay Area Clean Air Plan (CAP) (BAAQMD 2017c). The CAP provides a regional strategy to protect public health and the climate by progressing toward attaining all state and federal air quality standards, eliminating health risk disparities from exposure to air pollution among Bay Area communities, transitioning the region to a post-carbon economy needed to achieve greenhouse gas (GHG) reduction targets for 2030 and 2050, and providing a regional climate protection strategy that will put the Bay Area on a pathway to achieve those GHG reduction targets. The CAP includes a wide range of control measures designed to decrease emissions of the air pollutants that are most harmful to SFBAAB residents, such as particulate matter, ozone, and toxic air contaminants (TACs); reduce emissions of methane and other "super-GHGs"[8] that are potent climate pollutants in the near-term; and decrease

[8] "Super-GHGs" are climate pollutants that have a powerful ability to contribute to global warming, such as methane, black carbon, and fluorinated gases.

emissions of carbon dioxide by reducing fossil fuel combustion (BAAQMD 2017c).

The BAAQMD CEQA Guidelines recommend that a project's consistency with the current CAP be evaluated using the following three criteria:

a. The project supports the goals of the Air Quality Plan;
b. The project includes applicable control measures from the CAP; and
c. The project does not disrupt or hinder implementation of any control measures from the CAP.

If it can be concluded with substantial evidence that a project would be consistent with the above three criteria, then the BAAQMD would consider it to be consistent with air quality plans prepared for the Bay Area (BAAQMD 2017b).

The primary goals of the CAP are to make progress towards achieving attainment for all air quality standards, reduce population exposure to air pollution and protect public health in the Bay Area. The BAAQMD-recommended guidance for determining if a project supports the goals of the current CAP is to compare project-estimated emissions with BAAQMD thresholds of significance. If a project's emissions would not exceed the thresholds of significance after the application of all feasible mitigation measures, the project would be consistent with the goals of the CAP. As indicated in the following discussion with regard to air quality Question b in this checklist, this Project would result in a potential significant impact from construction-related emissions of fugitive dust; therefore, the Project could conflict with or obstruct implementation of the CAP and could have a significant air quality impact before mitigation. However, the Project would implement **Mitigation Measure AQ-1: Implement BAAQMD Basic Construction Mitigation Measures**, discussed under Question b below. With implementation of Mitigation Measure AQ-1, fugitive dust emissions would be reduced to a less-than-significant level, and the Project would not generate emissions related to either construction or operation that would exceed the BAAQMD mass emissions thresholds of significance for criteria air pollutants. Thus, the Project would not conflict with the goals of the CAP.

Mitigation Measure AQ-1: Implement BAAQMD Basic Construction Mitigation Measures

The following applicable Bay Area Air Quality Management District (BAAQMD) Basic Construction Mitigation Measures shall be implemented by construction contractors to reduce emissions of fugitive dust and equipment exhaust:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.

- 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 within the project site.
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485, of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- Post a publicly visible sign with the telephone number and person to contact at the District (or its designee) regarding dust complaints. This person shall respond and take corrective action within 48 hours. The BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations.

The CAP contains 85 control measures aimed at reducing air pollution in the SFBAAB, and Projects that incorporate all feasible air quality plan control measures are considered consistent with the CAP. The CAP does not provide any measures specific to habitat restoration or flood resiliency projects and, therefore, no inconsistency with the CAP is identified.[9] With no specific control measures from the 2017 CAP applicable, the Project would not hinder implementation of CAP control measures and would meet the requirements in Question b. Additionally, the Project would not disrupt or hinder implementation of any CAP measure and, therefore, meet the requirements of Question c below.

The Project would not generate emissions that would hinder the CAP goal of achieving attainment status, and the Project would be consistent with the measures discussed in the CAP. Therefore, the Project would not conflict with or obstruct implementation of the CAP. The impact would be less than significant with mitigation incorporated.

[9] For CalEEMod modeling purposes, recreational land use (golf course subtype) was selected as the best representation for habitat restoration or flood resiliency projects. CalEEMod has no selection for habitat restoration land uses. Golf course is the closet representation of a large tract of vegetated land.

b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard.

The Federal Clean Air Act and the California Clean Air Act both require the establishment of standards for ambient concentrations of air pollutants, called Ambient Air Quality Standards (AAQS). The federal National Ambient Air Quality Standards (NAAQS), established by USEPA, are typically less stringent, or the same as the state AAQS, which are established by the California Air Resources Board (CARB) and enforced by the BAAQMD based on the project's location and jurisdiction.

In developing thresholds of significance for air pollutants, BAAQMD considered the emission levels at which a project's individual emissions would be cumulatively considerable. Therefore, if a project would result in an increase in ROG, NO_X, PM_{10}, or $PM_{2.5}$ emissions more than its respective average daily emissions significance thresholds, then it would also contribute considerably to a significant cumulative impact. If a project would not exceed the significance thresholds, its emissions would not be cumulatively considerable. The Bay Area experiences occasional violations of ozone and particulate matter (PM_{10} and $PM_{2.5}$) standards. As discussed above, the Project area currently is designated as a non-attainment area for violation of the state 1-hour and 8-hour ozone standards, the federal ozone 8-hour standard, the state PM_{10} 24-hour and annual average standards, the state $PM_{2.5}$ annual average standard, and the federal $PM_{2.5}$ 24-hour standard (BAAQMD 2017a).

Project Construction

Less-than-Significant Impact with Mitigation Incorporated. Construction activities associated with the Project would involve use of equipment that would emit exhaust containing ozone precursors, which are reactive organic gases (ROG) and nitrogen oxides (NO_X). These ROG and NO_X emissions can impact ground level ozone concentrations. Ground level ozone is a secondary photochemical pollutant that is generated through the combination of ROG, NO_X, and ultraviolet solar radiation.

On-site and off-site vehicle activity associated with material transport and construction worker commuting would also generate emissions. Emission levels for these activities would vary depending on the number and types of equipment used, duration of use, operation schedules, and the number of construction workers. Criteria pollutant emissions of ROG and NO_X from these emission sources would incrementally add to the regional atmospheric loading of ozone precursors during Project construction.

Air pollutant emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ that would be generated by off-road construction equipment (e.g., excavators, graders, loaders) were estimated using the CalEEMod (version 2020.4.0) model along with the Project-

specific construction schedule and equipment requirements that would be used during the following construction seasons of the Project as presented in **Table 5**. The transportation-related emissions are determined using the EMFAC model (2021 v1.0.2), then added to the construction emissions determined using CalEEMod.

TABLE 5
CONSTRUCTION SEASONS AND DURATION

Emissions	Start	End
Bird Ponds (Season 1)	May 2024	November 2024
Bird Ponds (Season 2)	May 2025	September 2025
Deer Island Basin South (Season 1)	May 2026	October 2026
Deer Island Basin South (Season 2)	May 2027	September 2027

Project-related construction emissions were modeled under the assumption that construction for Deer Island Basin South and Bird Ponds would begin May 1, 2024, and the Project is assumed to conclude September 2027.

The BAAQMD recommends that for construction projects that are less than one-year duration, impacts should be annualized over the scope of actual days that peak impacts are to occur, rather than a full year (BAAQMD 2017b). Although the Project would require more than one year of construction, the construction periods are seasonal (i.e., construction would not occur year-round). The number of working days can overlap depending on the phase and are shown in **Table 6** for each phase and season. The emissions from overlapping phases are accounted for in CALEEMOD. Emissions that occur on the same day for each phase are added together to get total daily emissions.

All assumptions and calculations used to estimate the Project-related construction emissions are provided in **Appendix A**. Estimated average daily emissions are shown in **Table 7** and are compared to the BAAQMD thresholds.

As indicated in Table 7, the average daily construction exhaust emissions would not exceed the BAAQMD's significance thresholds, with the implementation of Mitigation Measure AQ-1. Therefore, impacts associated with the potential for construction-related exhaust emissions to result in or contribute to a violation of an air quality standard would be less than significant.

In addition to exhaust emissions, emissions of fugitive dust would also be generated by construction activities associated with grading and earth disturbance, travel on paved and unpaved roads, etc. Such emissions could result in a significant impact. With regard to fugitive dust emissions, the BAAQMD Guidelines focus on implementation of recommended dust control measures rather than a quantitative comparison of estimated emissions to a significance threshold.

For all projects, the BAAQMD recommends the implementation of its Basic Control Mitigation Measures (BAAQMD 2017b). The implementation of the BAAQMD's fugitive dust Basic Control Mitigation Measures, which are listed in Mitigation Measure AQ-1, would reduce potential impacts associated with fugitive dust emissions to a less-than-significant level.

TABLE 6
CONSTRUCTION OPERATING DAYS PER SEASON AND PHASE

Season/ Operating Days	Phase
Bird Ponds (Season 1)	
43	Site Preparation
65	Bird Pond Excavation
65	Novato Creek Channel Excavation
44	Lynwood Levee Improvements
22	Novato Creek Farmers Left Bank
239	*Cumulative Days*
Bird Ponds (Season 2)	
22	Site Preparation
44	Duck Bill and Herons Beak Levee Excavation
44	Lynwood Levee Improvements
22	S2 AB surface on Levees
22	Breaches/Connector Channels
22	Revegetation
176	*Cumulative Days*
Deer Island Basin South (Season 1)	
65	Site Preparation
88	Novato Creek Channel Excavation
66	Interior Tidal Channel Excavation
110	New NSD Force Main Levees and Berms
329	*Cumulative Days*
Deer Island Basin South (Season 2)	
87	NSD Levee and Berms
22	New NSD RWF Levee
44	Novato Creek Left Bank Excavation
44	Concrete for Water Control Structures
22	New Levee Surfacing
22	Breaches & Tidal Connector Channel Excising
22	Revegetation
263	*Cumulative Days*

TABLE 7
AVERAGE DAILY PROJECT CONSTRUCTION-RELATED POLLUTANT EMISSIONS (POUNDS/DAY)

Emissions	ROG	NO_X	Exhaust PM_{10}[a]	Exhaust $PM_{2.5}$[a]
Bird Ponds (Season 1 2024)	1.03	3.55	0.14	0.13
Bird Ponds (Season 2 2025)	0.83	2.12	0.14	0.07
Deer Island Basin South (Season 1 2026)	1.25	5.66	0.20	0.32
Deer Island Basin South (Season 2 2027)	4.64	12.68	0.34	0.31
Maximum Average Daily Emissions	**4.64**	**12.68**	**0.34**	**0.32**
BAAQMD Construction Threshold	*54*	*54*	*82*	*54*
Significant Impact?	No	No	No	No

NOTES:
a BAAQMD's construction-related significance thresholds for PM10 and PM2.5 apply to exhaust emissions only and not to fugitive dust.

Project Operation

Less-than-Significant Impact. Once construction is complete, there would be marginal operational emissions. The Project has been designed to minimize the need for active operations and ongoing maintenance. There would be no operable facilities associated with the Project. The District would perform routine observation and maintenance to maintain the remaining flood protection facilities, including both the levees and the water control structures, along the Project reaches. Typical levee monitoring activities would include inspection for erosion or rodent damage along the levee tops and slopes. Typical levee maintenance activities include fire fuel reduction, mowing and weed control, and repair of erosion sites. Typical water control structure monitoring and maintenance activities include inspection of the slide and flap gates for functionality and removal of any accumulated debris or sediment at the downstream end of the culverts to ensure proper drainage. The District would continue to observe geomorphic changes along Novato Creek in order to monitor the flood conveyance capacity of the creek channel. The District may perform localized sediment removal near the SMART bridge, if necessary, to provide appropriate flood protection to critical infrastructure.

As the Project would result in minimal emissions from any new operational air quality emissions from either stationary sources (e.g., mower) or increases in vehicle traffic, the operational impacts with respect to air quality emissions would be less than significant.

c) Expose sensitive receptors to substantial pollutant concentrations?

Less-than-Significant Impact. The BAAQMD recommends that lead agencies assess the incremental toxic air contaminant (TAC) exposure risk to all sensitive receptors (e.g., residences, schools) within a 1,000-foot radius of a project's fence line (BAAQMD 2017b).

Short-term project construction activities would generate DPM. The majority of DPM exhaust emissions that would be generated during construction would be from the use of diesel off-road equipment with a smaller amount generated by the use of heavy-duty trucks to deliver building material and equipment to the site.

The dose to which receptors are exposed is the primary factor affecting health risk from exposure to TACs. Dose is a function of the concentration of a substance or substances in the environment and the duration of exposure to the substance. According to the Office of Environmental Health Hazard Assessment (OEHHA), health risk assessments should be based on a 9, 30, and/or 70-year exposure periods to determine the health risk to sensitive receptors from cancer or chronic non-cancer health effects of TAC emissions (such as DPM). However, OEHHA also states that such health risk assessments should be limited to the duration of the emission-producing activities associated with a project, unless the activities occur for less than six months. Activities that would last more than two months, but less than six months, are recommended to be evaluated as if they would last for six months (OEHHA 2015).

Table 7 shows that the average daily PM_{10} exhaust emissions (PM_{10} is considered the surrogate for DPM to ensure conservative modeling assumptions) from construction at the Project site would be 0.34 pounds per day. Although the nearest receptor (a residence) is 70 feet from one of the construction areas during Season 2 of the Deer Island Basin South construction period, the total number of days of exposure would be 12 days total. As cancer risk are calculated over a 30-year period, 12 days of 30 years is less than 0.1%. The majority of the construction would occur 600 feet from the nearest receptor. At this distance, the DPM from construction equipment. has dispersed considerably compared to a 70 feet distance. Additionally, the cancer risk is likely to be well below the 10 per million threshold when compared to the freeways and high traffic roads siting recommendation to “avoid siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles per day” (CAPCOA 2009). Both construction and operational activities for this project will involve far fewer combustion sources (cars and trucks). Thus, the project would not result in a significant incremental cancer risk (BAAQMD 2017b).

Additionally, even though the Project would result in a less-than-significant impact related to incremental cancer risk and the exposure of sensitive receptors to substantial pollutant concentrations, the implementation of Mitigation Measure AQ-1 would further limit receptors’ exposure to DPM emissions because it would require the contractor to implement idling restrictions when operating construction equipment reducing DPM emissions further. Impacts related to exposure of sensitive receptors would be less than significant.

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

Less-than-Significant Impact. The Project does not include any long-term sources of odor. Diesel equipment used to construct the Project may emit objectionable odors associated with combustion of diesel fuel. The odors would be mitigated by the implementation of Mitigation Measure AQ-1 would further limit receptors' exposure to the odors associated with DPM emissions because it would require the contractor to implement idling restrictions when operating construction equipment reducing DPM emissions further. Additionally, the BAAQMD provides guidance on what type of source would produce objectionable odors at various distances. None of these sources are associated with the project (BAAQMD 1999). Impacts related to exposure of sensitive receptors would be less than significant.

4. Biological Resources

Would the project:	Significant or Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
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?	☐	☒	☐	☐
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 U.S. Fish and Wildlife Service?	☐	☒	☐	☐
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?	☐	☐	☒	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☒	☐	☐
f) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒

Discussion

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

Less-than-Significant Impact with Mitigation Incorporated. The 326.6-acre Project site is mostly comprised of diked baylands that are no longer hydrologically connected to Novato Creek. The Project site contains four upland habitat types and seven habitat types associated with aquatic features (ESA 2020). The following upland habitat types occur in the Project site: non-native grassland, non-native scrubland, oak woodland, and developed. Aquatic habitat types in the Project site include: tidal marsh, seasonal wetland, alkali wetland, permanently flooded wetland, tidal channel (Novato Creek), and ponds. The acreage of each habitat type within the Project site is summarized in **Table 8** and presented in Figure 4. More detailed information such as dominant vegetation and wildlife observed at each of the habitat types can be found in **Appendix B**.

TABLE 8
HABITAT TYPES BY ACREAGES IN THE PROJECT SITE

Habitat Type	Acreage
Upland Habitat Types	
Non-native Grassland	16.4
Non-native Scrubland	3.0
Oak Woodland	2.1
Developed	12.6
Aquatic Habitat Types	
Tidal Marsh	34.7
Seasonal wetland	199.9
Alkali wetland	10.5
Permanently flooded wetland	5.2
Tidal channel (Novato Creek)	6.4
Pond	35.8
TOTAL	**326.6**

Special-Status Plants

The California Natural Diversity Database and California Native Plant Society Electronic database identify four special-status plants in the near-project vicinity with at least a moderate likelihood to occur within the Project site (CDFW 2022a; CNPS 2022; ESA 2020). Descriptions of each species are provided below. Other rare plant species from the region were determined unlikely to occur based on lack of suitable specific habitat conditions (i.e., vernal pools), associated habitat communities are not present (i.e., chaparral), lack of suitable soil conditions, or because the Project site is below the elevation range of the species, or due to the lack of local sightings (ESA 2020). The four moderate-potential plant species are described below.

Point Reyes salty bird's-beak (*Chloropyron maritimum* ssp. *palustre*) is a California Rare Plant Rank (CRPR) 1B.2 species. Point Reyes salty bird's-beak is found in the heavy clay soils of coastal salt marshes of northern San Francisco Bay and occurs at the upper end of tidal zones. It is associated with pickleweed, salt grass, fat hen, and jaumea and is rarely found in non-tidal conditions. Point Reyes salty bird's-beak is an annual herb in the broomrape family (Orobanchaceae) that blooms from May to October. It typically occurs in low growing marsh vegetation in coastal salt marshes at elevations ranging from 0 to 30 feet. Point Reyes salty bird's-beak is known to occur 5.3 miles north within the Petaluma marsh, one of the largest contiguous expanse of historical tidal marsh in the San Pablo Bay (SFEI 2018). Potentially suitable tidal marsh habitat exists in the Project site, however the tidal marsh in the Project site is most likely recently formed (within the last 50 to 100 years) from sedimentation within the Novato Creek channel after construction of the levees along Novato Creek and

therefore likely less biologically diverse than most historic tidal marshes in the area that were formed between 2,000 and 5,000 years ago and therefore potentially less likely to contain rare plants such as Point Reyes salty bird's-beak than historic tidal marshes.

Marin knotweed (*Polygonum marinense*), a CRPR 3.1 species, is an annual forb in the knotweed family (Polygonaceae) that blooms from May to August. It typically occurs in salt and brackish marshes between 0 to 30 feet. This species has been documented along the Marin County shoreline 3.4 miles from the Project site to the north and 6.2 miles to the south in historic tidal marshes. Potentially suitable tidal marsh habitat exists in the Project site, however the tidal marsh in the Project site is most likely recently formed (within the last 50 to 100 years) from sedimentation within the Novato Creek channel after construction of the levees along Novato Creek and therefore potentially less likely to contain rare plants such as Marin knotweed than historic tidal marshes.

Congested-headed hayfield tarplant (*Hemizonia congesta* ssp. *congesta*), a CRPR 1B.2 species, is an annual forb in the sunflower family (Asteraceae) that can have a wide blooming period between April to November. It typically occurs in grassy sites and marsh edges at elevations below 330 feet. This species has been documented in two occurrences located 1.5 miles and 4.7 miles south of the Project site. Non-native grassland between the tidal marsh and seasonal wetland provides suitable habitat for this species within the Project site.

Fragrant fritillary (*Fritillaria liliacea*), a CRPR 1B.2 species, is a threatened perennial herb in the Liliaceae family that blooms between February to April. It typically occurs in open hilly grasslands at altitudes less than 656 feet (200 meters) in elevation. The fragrant fritillary prefers heavy soils including clays, for example andesitic and basaltic soils derived from Sonoma volcanic soil layers provide suitable substrate for this species. This species has been documented in two recent occurrences located 2.5 and 2.8 miles north of the Project site. Non-native grassland on clay soils and wetland riparian within the Project site provide suitable habitat for this species.

Wetland restoration may directly or indirectly impact the four identified special-status plant species if they occur in the Project site. Impacts from the proposed changes to the Project to these species are considered to be potentially significant but can be reduced to a less-than significant level via implementation of **Mitigation Measures BIO-1** and **BIO-2**.

Mitigation Measure BIO-1: Rare Plant Surveys

A qualified botanist shall conduct appropriately timed floristic surveys for the special-status plant species identified as having a medium to high potential to occur within the construction disturbance area. The surveys shall be conducted in all suitable habitat within the potential disturbance area. Surveys and reporting shall be conducted following the current California

Department of Fish and Wildlife protocol. If special-status plant species are found, then the District shall prepare a mitigation and monitoring plan for plants that cannot be avoided. The plan shall specify success criteria that result in the preservation of at least as many special-status plants as are impacted by the Project. The plan shall be approved by the District prior to the initiation of any Project activities that will impact the special-status plant(s).

Mitigation Measure BIO-2: Best Management Practices for Biological Resources

- A qualified biologist (4-year college degree in biology or related field and demonstrated experience with the species of concern) shall provide Worker Environmental Awareness Training (WEAT) to field management and construction personnel. Communication efforts and training shall take place during pre-construction meetings so that construction personnel are aware of their responsibilities and the importance of compliance. WEAT shall identify the types of sensitive resources located in the project site and the measures required to avoid impacts on these resources. Materials covered in the training program shall include environmental rules and regulations for the specific Project, requirements for limiting activities to the construction right-of-way, avoiding demarcated sensitive resource areas, and appropriate steps to take if special-status species are encountered.
- If new construction personnel are added to the Project, the contractor shall ensure the new personnel receive WEAT before starting work. A sign-in sheet of those contractor individuals who have received the training shall be maintained by the District. A representative shall be appointed during the WEAT to be the contact for any employee or contractor who might inadvertently kill or injure a listed species or who finds a dead, injured, or entrapped individual.
- All vehicle operators shall limit speed to 15 miles per hour (mph) within the Project site.
- No erosion control materials shall contain any plastic or monofilament netting and shall be wildlife-friendly (e.g., movable joints). It shall also be biodegradable and have certified weed-free straw if that is a component of the netting.
- To avoid attracting predators, all food-related trash items shall be bagged and removed daily. Other trash shall also be properly stored at the end of each day and properly disposed by the end of the project.

Special-Status Wildlife

Salt marsh harvest mouse (*Reithrodontomys raviventris*) are small, native rodents that are endemic to the salt marshes and adjacent diked wetlands of San Francisco Bay. Salt marsh harvest mice are listed as federally and state endangered species. This species is considered a California fully protected species.

The salt marsh harvest mouse is endemic to the marshes which border San Francisco, San Pablo, and Suisun Bays. There are two subspecies of salt marsh harvest mouse: the northern subspecies (*Reithrodontomys raviventris halicoetes*) is found in the Marin Peninsula and San Pablo and Suisun Bays (Shellhammer and Barthman-Thompson 2015). The southern subspecies (*R. r. raviventris*) lives in the marshes of Corte Madera, Richmond, and South San Francisco Bay (Shellhammer and Barthman-Thompson 2015). Occurrence of both subspecies within this small range is highly fragmented.

The primary habitat of the salt marsh harvest mouse is the middle to upper zone of salt and brackish marshes. The salt marsh harvest mouse is dependent on dense vegetation cover, usually in the form of pickleweed (the dominant salt marsh vegetation in the Bay) and other salt-dependent or salt-tolerant vegetation. Optimal salt marsh harvest mouse habitat has dense vegetative cover with a high percentage cover of pickleweed and has contiguous dense and tall cover in which the mice can escape extreme water levels without excessive exposure to predation. Salt marsh harvest mouse may also move into grasslands adjacent to marshes during extreme high tides if dense cover is present. The mouse is largely herbivorous. Recent studies have shown that pickleweed and salt bush (*Atriplex* spp.) are dominant plants in their diet, although their diets may be more flexible than what was previously thought (Aylward 2022; Smith and Kelt 2019). Loss of habitat due to the diking and filling of wetlands has been the major factor contributing to the decline of the salt marsh harvest mouse.

Two CNDDB occurrences were observed along the shoreline of San Pablo Bay, 2.3 miles northeast and 3.2 miles southeast of the Project site. The closer occurrence was observed in 2005 along the Petaluma marsh on the west bank of the Petaluma River dominated by pickleweed (CNDDB occurrence #18). The further occurrence was within Las Gallinas Creek within tidal salt marsh dominated by pickleweed in 1986 (CNDDB occurrence # 30). One salt marsh harvest mouse was also recorded during a trapping event in 1976 in tidal salt marsh downstream of the Project site adjacent to Bel Marin Keys, approximately 1.0 mile from the Project site (CDFG 1976).

The tidal marsh and seasonal wetlands are lined with mostly steep levees, roads, or hillsides reducing potential refugia habitat for salt marsh harvest mouse during winter flooding events. In 2016 and 2020 salt marsh harvest mouse monitoring was conducted within the North Deer Island Basin during vegetation removal and none were observed (WRA 2017, 2020b). The tidal marsh and seasonal wetlands within the Project site provide potential low-quality habitat for salt marsh harvest mouse.

Excavation and placement of dredged material and sediment during construction may directly or indirectly impact salt marsh harvest mouse through habitat modification or direct disturbance to individuals.

Salt marsh harvest mouse is a fully protected species under California Fish and Game Code. Take of Fully Protected species is not permitted, except for very specific circumstances, including efforts to support species recovery. The Project's restoration will include excavation and placement of sediment in potential habitat for salt marsh harvest mouse is necessary to support recovery of the species. While take of salt marsh harvest mouse for the Project to support recovery of the species may be permitted by California Fish and Game Code, potential impacts from the proposed changes to the Project to salt marsh harvest mouse are considered to be potentially significant under CEQA. These potential impacts can be reduced to a less-than-significant level via implementation of **Mitigation Measures BIO-2** (above) and **Mitigation Measures BIO-3** (below).

Mitigation Measure BIO-3: Salt Marsh Harvest Mouse Protection

- Ground disturbance to suitable salt marsh harvest mouse habitat (including, but not limited to pickleweed, and emergent salt marsh vegetation) shall be avoided to the extent feasible. Where salt marsh harvest mouse habitat cannot be avoided (such as for channel excavation, access routes and grading, or anywhere else that vegetation could be trampled or crushed by work activities), vegetation shall be removed to ground level from the ground disturbance work area plus a 5-foot buffer around the area, as well as any access routes within salt marsh harvest mouse habitat, utilizing mechanized hand tools or by another method approved by USFWS and CDFW. Vegetation height shall be maintained at or below 5 inches above ground. Vegetation removal in salt marsh harvest mouse habitat shall be conducted under the supervision of the qualified biologist.
- Salt marsh harvest mouse marsh habitat that must be accessed by mini-excavators or other vehicles to complete Project construction (e.g., excavating smaller channels) shall be protected through use of low ground pressure (LGP) equipment, wooden or PVC marsh mats, or other method approved by USFWS and CDFW following vegetation removal.
- Construction activities related to restoration and infrastructure shall be scheduled to avoid extreme high tides when there is potential for salt marsh harvest mouse to move to higher, drier grounds, such as ruderal and grassland habitats. No Project activities shall be conducted within 50 feet of suitable tidal marsh or other salt marsh harvest mouse habitat during an extreme high tide event (6.5 feet or higher measured at the Golden Gate Bridge and adjusted to the timing of local high tides) or when the adjacent marsh is flooded unless wildlife exclusion fencing has been installed around the work area.
- All construction equipment and materials shall be staged on existing roadways and away from suitable salt marsh harvest mouse habitat when not in use. All construction equipment shall be visually inspected prior to work activities each day for signs of salt marsh harvest mouse or any other wildlife.

- Vegetation shall be removed from all non-marsh areas of disturbance (driving roads, grading and stockpiling areas) to discourage the presence of salt marsh harvest mouse.
- A qualified biologist with previous salt marsh harvest mouse monitoring and/or surveying experience shall be on site during construction activities occurring in suitable habitat. The qualified biologist will have the authority to stop Project activities if any of the requirements associated with these measures are not being fulfilled. If a potential salt marsh harvest mouse is observed in the work area, construction activities shall cease in the immediate vicinity of the sighting. The individual shall be allowed to leave the area before work is resumed. If the individual does not move on its own volition, the qualified biologist would contact USFWS (and CDFW if appropriate) for further guidance on how to proceed.
- If the qualified biologist has requested work stoppage because of take of any of the listed species, or if a dead or injured salt marsh harvest mouse is observed, USFWS and CDFW shall be notified within 1 day by email or telephone.

California Ridgway's rail (*Rallus obsoletus obsoletus*), formerly known as the California clapper rail) is a federally endangered, state endangered, and California fully protected species. The California Ridgway's rail is the resident rail subspecies of northern and central California, and is currently restricted to the San Francisco Bay Estuary, with the largest populations occurring in remnant salt marshes of south San Francisco Bay. The California Ridgway's rail occurs only within salt and brackish marshes. In south and central San Francisco Bay, the California Ridgway's rail typically inhabits salt marshes dominated by pickleweed and cordgrass. Breeding occurs from mid-March through July, with peak activity in late April to late May.

The California Ridgway's rail is a secretive, hen-like waterbird that lives in salt and brackish tidal marshes in the San Francisco Bay. This species once occupied coastal California tidal marshes from Humboldt Bay southward to Morro Bay, and estuarine marshes of San Francisco Bay and San Pablo Bay to the Carquinez Strait (Raabe et al. 2010). Resident populations are currently limited to San Francisco Bay, San Pablo Bay, Suisun Bay, and associated tidal marshes.

California Ridgway's rail occur almost exclusively in tidal salt and brackish marshes with unrestricted daily tidal flows, adequate invertebrate prey food supply, well developed tidal channel networks, and suitable nesting and escape cover during extreme high tides (Raabe et al. 2010). They depend on mudflats or very shallow water within a network of tidal channels where there are both abundant invertebrate populations and taller plant material to provide cover, refuge during high tides, nesting opportunities above high tides and wave action, and protection from predators. California Ridgway's rail rely on marsh plants such as Pacific cordgrass (*Spartina foliosa*), bulrush (*Bolboschoenus maritimus*),

and pickleweed for breeding and feeding. They feed mostly under or near vegetation, which shelter many of the food items rails depend on, such as crustaceans, bivalves, and insects.

A California Ridgway's rail assessment was conducted in July 2016 and a protocol-level survey was conducted in April 2020 by WRA for the Novato Creek Sediment Removal and Wetland Enhancement Project. No rail species were identified or observed during the site assessment conducted in July 2016 or the four protocol-surveys conducted from late January to early April in 2020. During the protocol-level surveys, 11 listening stations were distributed along the tidal marsh surrounding Novato Creek within the Project site (WRA 2016, 2020a).

In the recent past a California Ridgway's rail was observed within the brackish tidal marsh area of Novato Creek south of SR 37, but none were observed within the Project site. Also, downstream of the Project site, in salt marshes, many observations and evidence of California Ridgway's rail have been documented (CDFG 1976). They were also documented within the middle and upper tidal reaches of Novato Creek in 2006 (Liu et al. 2012). More recent documentations have been made of California Ridgway's rail towards the mouth of Novato Creek, including during rail surveys from 2008 to 2011 (Liu et al. 2012). Two documented CNDDB occurrences are located along Novato Creek south of SR 37. One occurrence near SR 37 is from 1993. The other occurrence covers the tidal marsh around the mouth of Novato Creek and includes documented occurrences in 1985, 2000, and 2008 through 2011, approximately 2 miles east of the Project site. California Ridgway's rail are also well documented within the mouth of the Petaluma River located directly north of the Project site and at the mouth of Gallinas Creek, approximately 5 miles south of the Project site (CDFW 2022a). During reconnaissance surveys in 2018, California Ridgway's rail was observed in tidal marsh along Novato Creek approximately 0.7 miles east of the SR 37 bridge (WRA 2020a).

Currently, the tidal marsh within the Project site may not provide sufficient density of tall marsh vegetation to support California Ridgway's rail (Schaaf and Wheeler 2018). The 2020 rail survey determined that habitat suitability for rails decreases in the more upstream (western portions) of the relevant reach of Novato Creek, where wetland vegetation is increasingly brackish/freshwater, and the lateral extent of marsh plain is narrower and/or steeper (WRA 2020a). The existing tidal marsh habitat appears to be low quality habitat for California Ridgway's rail due to small extent of the marsh being restricted to narrow strips between Novato Creek and the Novato Creek levees and no network of smaller dendritic tidal channels connected to Novato Creek. The tidal marsh within the Project site also receives slightly restricted tidal flows making it lower quality habitat for California Ridgway's rail. Although not recently detected, given the nearby documented occurrences and suitable low-quality habitat within the Project site, California Ridgway's rail has a potential to occur within the Project site.

California black rail (*Laterallus jamaicensis*) is a California threatened species for which breeding habitat potentially exists in the tidal marsh habitat in the Project site. This species lives in coastal salt and brackish marshes. Year-round residents, these species stay mainly in the upper to lower zones of coastal marshes that are dominated by pickleweed. Threats to this species include lost and degradation of salt marsh habitat, encroachment of human activities, genetic isolation due to habitat fragmentation, and predation from coyotes, raptors, possibly river otters, raccoons, and feral cats. Many recent observations of river otters have occurred near the Project site (River Otter Ecology Project 2020).

California black rail were also not detected during the protocol-level surveys conducted in 2020 or the 2016 rail assessment. California black rails typically occur in larger tracts of tidal/brackish marsh in the immediate vicinity of San Pablo Bay. The narrow strips of tidal marsh along Novato Creek may be too limited in area to support black rail occupancy (WRA 2016). The seasonal wetland within the diked basin also is not likely to provide the necessary refugia habitat for black rails. Historical occurrences from 1993 have been observed black rails just south of the Project site within the Novato Creek tidal marsh (CNDDB occurrence #105). Although California black rails have not recently been detected in the Project site, this species could still have potential to occur due to the presence of marginally suitable habitat.

Potential suitable ground-nesting and foraging habitat for California Ridgway's rail and California black rail may be found within tidal marsh portions of the Project site. Impacts could occur on rails during construction during both the breeding and non-breeding seasons. Impacts during the non-breeding season are not considered significant, primarily due to the birds' mobility and ability to access other high-quality foraging habitat in other tidal marsh channels within 3 miles of the Project site. However, Project construction could render the site temporarily unsuitable for breeding rails due to the noise and increased activity levels associated with grubbing, earth moving, heavy equipment operation, and increased human presence even when the nest itself is unaffected. These activities could cause the direct destruction of an active nest, or cause birds that have established a nest prior to the start of construction to change their behavior or even abandon an active nest, putting eggs and nestlings at risk for mortality. This would be considered a significant impact.

Temporary impacts could result in significant impacts on California Ridgway's rail and California black rail. However, implementation of **Mitigation Measures BIO-2** (above) and **BIO-4** (below) would reduce potential impacts on California Ridgway's rail and California black rail to less-than-significant by providing environmental training to construction personnel, providing general protection measures, avoiding disturbance to rail nesting habitat, conducting pre-construction protocol surveys to identify any active nests, and stopping work if

Project activities disturb nesting rails. With implementation of Mitigation Measures BIO-2 and BIO-4, impacts would be less than significant.

Mitigation Measure BIO-4: California Ridgway's Rail and California Black Rail Protection

- To minimize or avoid the loss of individual California Ridgway's rail and California black rail, construction activities, including vegetation management activities requiring heavy equipment, adjacent to the tidal marsh areas (within 500 feet [150 meters]) or a distance determined in coordination with USFWS or CDFW, shall be avoided during the breeding season from February 1 through August 31.
- If areas within or adjacent to rail habitat cannot be avoided during the breeding season, protocol-level surveys shall be conducted to determine rail nesting locations. The surveys shall focus on potential habitat that could be disturbed by construction activities during the breeding season to ensure that rails are not breeding in these locations.

Other Special-Status and Non-Special-Status Avian Species

Northern harrier, salt marsh common yellowthroat, and San Pablo song sparrow are California Species of Special Concern that occur within the Project site. The Project site provides suitable foraging habitat for northern harrier in the tidal and diked marshes, and nesting habitat for this ground-nesting species in a few isolated upland areas. The Project site provides suitable nesting habitat in emergent marsh vegetation and tall, dense ruderal vegetation for salt marsh common yellowthroat and San Pablo song sparrow. It is likely that common species, also subject to provisions of the Migratory Bird Treaty Act (MBTA), such as house finch (*Haemorhous mexicanus*), northern mockingbird (*Mimus polyglottos*), and California towhee (*Melozone crissalis*), nest in the Project site. Bird species listed under the Federal Endangered Species Act (FESA) and the California Endangered Species Act (CESA), as well as non- listed birds, are afforded conservation protections. As discussed below under the *Regulatory Setting*, most breeding birds are protected under California Fish and Game Code Section 3503, and raptors are protected under Section 3503.5. In addition, Section 3513 of the Code and the federal MBTA (16 USC, Sec. 703 Supp. I, 1989) prohibit the killing, possession, or trading of migratory birds. Finally, Section 3800 of the Code prohibits the taking of non-game birds, which are defined as birds occurring naturally in California that are not game birds or fully protected species.

Because special-status bird species and birds protected by the MBTA could nest in trees, shrubs, grasses, emergent vegetation, marsh vegetation, or even on bare ground, all terrestrial parts of the Project site are considered potential nesting habitat. Therefore, active nests could be encountered during restoration-related construction activities that could include clearing and grubbing vegetation,

excavating tidal channels, use of heavy equipment and dump trucks, and presence of workers and vehicles associated with all aspects of construction.

Impacts could occur on resident and migratory species from construction during both the breeding and non-breeding seasons. Impacts during the non-breeding season are not considered significant, primarily due to the absence of active nests and the birds' mobility and ability to access other high-quality foraging habitat in the region. However, equipment staging and Project construction could render the site temporarily unsuitable for breeding birds due to the noise, vibration, and increased activity levels associated with grubbing, earth moving, heavy equipment operation, and increased human presence even when the nest itself is unaffected. These activities could cause the direct destruction of an active nest, or cause birds that have established a nest prior to the start of construction to change their behavior or even abandon an active nest, putting eggs and nestlings at risk for mortality. This would be considered a significant impact.

Implementation of **Mitigation Measures BIO-2** (above) and **BIO-5** (below) would ensure that the Project would have a less-than-significant impact on nesting birds by providing environmental training to construction personnel, providing general protection measures, identifying active nests, and establishing no-work buffer zones around active nests identified on or near the Project site.

Mitigation Measure BIO-5: Nesting Bird Protection

- Removal of trees and scrub vegetation shall occur outside the bird nesting season (February 1 to August 31), to the extent feasible.
- If removal of trees and vegetation cannot be fully accomplished outside of the nesting season, a qualified biologist shall conduct pre-construction nesting surveys within seven (7) days prior to the start of such activities or after any construction breaks of 10 days or more. Surveys shall be performed for the Project site and suitable habitat within 330 feet of the Project site to locate any active raptor (birds of prey) nests or rookeries.
- If active nests are located during the pre-construction bird nesting survey, the qualified biologist shall evaluate if the schedule of construction activities could affect the active nests and the following measures shall be implemented based on their determination:
  - If construction is not likely to affect the active nest, it may proceed without restriction; however, a biologist shall regularly monitor the nest to confirm there is no adverse effect and may revise their determination at any time during the nesting season. In this case, the following measure would apply.
  - If construction may affect the active nest, the biologist shall establish a no-disturbance buffer in coordination with CDFW. Typically, these standard buffer distances will start at 30 feet for passerines and 330 feet for raptors. These distances may be adjusted depending on the level of surrounding ambient activity (e.g., if the Project site is

adjacent to a road or active trail) and if an obstruction, such as a building, is within line-of-sight between the nest and construction. For bird species that are federally and/or state-listed sensitive species (i.e., fully protected, endangered, threatened, species of special concern), a lead agency representative or qualified biologist shall coordinate with USFWS and/or CDFW regarding modifications to nest buffers, prohibiting construction within the buffer, modifying construction, or removing or relocating active nests that are found on the site.

- Any birds that begin nesting within the Project site and survey buffers amid construction activities are assumed to be habituated to construction-related or similar noise and disturbance levels. A qualified biologist shall coordinate with USFWS and/or CDFW and determine if no work exclusion zones shall be established around active nests in these cases.

Western pond turtle (*Actinemys marmorata*) is a California species of special concern and a candidate for listing under the U.S. Endangered Species Act. Western pond turtles have been observed in 2020 and 2021 within Duck Bill Pond. Western pond turtle inhabits relatively calm water such as lakes, natural and artificial ponds, irrigation ditches, and marshes with basking sites such as logs and mud banks. Although generally found in freshwater habitats, it may briefly visit brackish or saltwater habitats. Adjacent terrestrial habitat is also critical for egg-laying, winter refuge, and dispersal.

Duck Bill Pond is a managed pond that provides suitable aquatic habitat for this species. The ruderal/disturbed areas and the riparian oak woodlands surrounding Duck Bill Pond provide upland and potential nesting habitat for this species. Numerous western pond turtles were observed basking on rocks within Duck Bill Pond during the August 2020 reconnaissance survey. Recent observations have also been made by other biologists of western pond turtles within Duck Bill Pond (MCFCWCD 2021). However, the Duck Bill Pond dried out in 2022, so turtles either had to move elsewhere or estivate. No western pond turtles were observed in the permanently flooded Lynwood Basin or Heron's Beak Pond, which was dry, at the time of the reconnaissance survey in August 2020. During a June 2020 western pond turtle survey at Heron's Beak Pond, no turtles were observed, and the pond was found to have limited habitat for turtles (Sequoia 2020). Within the recent past, western pond turtles were found within Novato Creek marshes in the vicinity of the Project site (CDFG 1976). However, presently Novato Creek and its adjacent tidal marsh likely does not provide suitable habitat for western pond turtles due to the water being too saline in summer and fall and minimal protected habitat areas for turtles during high water flows in winter and spring.

Given the known salinities in Novato Creek, it is very unlikely that Duck Bill Pond would remain suitable habitat for western pond turtle after tidal restoration. Also,

given the known salinity in Lynwood Basin and current absence of western pond turtle, it is not expected that western pond turtle could find suitable long-term year-round habitat within that nearby basin (MCFCWCD 2021; ESA 2021).

Implementation of **Mitigation Measures BIO-6** would ensure that the Project would have a less-than-significant impact on western pond turtle by implementing a western pond turtle relocation plan.

Mitigation Measure BIO-6: Western Pond Turtle Relocation Plan

A detailed western pond turtle relocation plan shall be prepared at least 3 weeks before the start of groundbreaking, and submitted to the California Department of Fish and Wildlife for review. The purpose of the plan is to standardize turtle relocation methods and relocation sites. A qualified biologist shall be present at the active work sites until western pond turtles have been removed or relocated, and habitat disturbance has been completed.

Central California Coast steelhead DPSs (*Oncorhynchus mykiss*). The Central California Coast (CCC) steelhead Distinct Population Segments (DPS) are listed as threatened under FESA. Steelhead possess the ability to spawn repeatedly, maintaining the mechanisms to return to the Pacific Ocean after spawning in freshwater. Juvenile steelhead may spend up to four years residing in freshwater prior to migrating to the ocean as smolts. CCC steelhead migrate through San Pablo Bay waters in transit between freshwater spawning areas and the Pacific Ocean and may therefore occur seasonally in the waters of the Study Area.

Central California Coast steelhead are known to occur in the upper reaches of the Novato Creek watershed and may pass through the Project site in transit between San Pablo Bay and upstream freshwater habitat. If special-status anadromous fish species were to occur within the vicinity of the Project site, their presence would only be temporary, as they move between spawning habitat and the Pacific Ocean and would likely occur outside the window when in-water work would occur. Implementation of **Mitigation Measures BIO-7** and **BIO-8** would ensure that the Project would have a less-than-significant impact on steelhead by implementing an in-water work window and a dewatering plan.

Mitigation Measure BIO-7: In-Water Work Window

All in-water construction shall be conducted within the environmental work window between June 1 and November 30, designed to avoid potential impacts on fish species.

Mitigation Measure BIO-8: Fish Protection during Construction

Fish and other aquatic species shall be excluded from occupying the area to be impacted during construction by using silt curtains or blocking the stream channel above and below the area to be dewatered with fine-meshed block

nets or screens while coffer dams and other diversion structures are being installed. Block net mesh shall be sized to ensure aquatic species upstream or downstream do not enter the areas proposed for dewatering. Mesh will be no greater than 3/32 inch diameter. The bottom of the net must be completely secured to the channel bed. Block nets or screens must be checked at least twice daily, at the beginning and end of the workday, and cleaned of debris to permit free flow of water. Block nets or screens shall be placed and maintained throughout the dewatering period at the upper and lower extent of the areas where aquatic species will be removed. Net placement is temporary and shall be removed once dewatering has been accomplished or construction work is complete for the day. Before commencement of dewatering the District shall develop a fish relocation plan, consistent with applicable federal and state permit requirements. Relocation shall be required for in-water work in the Novato Creek channel. The plan shall be prepared in coordination with the NMFS and CDFW. Implementation of the fish relocation plan shall be consistent with the following conditions:

- Before rescues of steelhead are attempted, any necessary authorization shall be obtained from the resource agencies (CDFW and/or NMFS).
- Before dewatering may occur, a qualified biologist shall determine whether the extent of dewatering will result in immediate or foreseeable impacts on fish and aquatic wildlife. This shall include conducting a reconnaissance survey of the dewatering zone.
- Before dewatering can begin, the following elements of fish relocation shall be determined:
  - *Staging Area:* Staging areas in the dewatering zone shall be identified. Sites should be selected based on their proximity and access to the dewatering zone and ability to support safe operation of the equipment.
  - *Relocation Sites:* Relocation site(s) shall be identified. Priority shall be given to a site's close proximity to the dewatering zone in the same stream. If a qualified onsite biologist determines that no suitable site in the stream is available, then "second choice" locations within the watershed shall be selected. In all cases, the closest site that is likely to result in a successful rescue shall be used.
  - *Transportation Routes:* Transport routes for rescued fish species shall be determined in advance of dewatering.
  - *Disease Consideration:* To guard against disease transmission, fish shall not be moved upstream beyond substantial barriers or long distances.
- If steelhead are encountered during relocation, they shall be moved upstream within the channel to a location of perennial running water or the best available habitat determined by a qualified biologist. Collection and transport methods shall be determined based onsite conditions. Methods shall also be selected to maximize the efficiency of the collection effort while minimizing handling and transport time and stress. Creek

water from the site shall be used in all containers. The local transport of fish may be completed using various methods, including:

- *Net Transfer:* Appropriate for short distances (less than 50 feet) where rapid transfer is possible.
- *Live Car:* Appropriate for temporary holding in the stream and for short distances where a rapid transfer is required.
- *Bucket:* Appropriate for temporary holding and transport over short to medium distances. Holding time should be minimized if possible and aeration should be supplied.
- *Aerated Cooler:* Appropriate for temporary holding and transport. Temperature shall be maintained to be similar to the temperature of the source creek water, and if necessary, fish shall be sorted by size to reduce risks of predation.

- Species and collection/relocation sites shall be prioritized as follows: (1) Threatened species; and (2) other native fishes.
- A contact person at each of the appropriate resource agencies (CDFW, NMFS, and/or USFWS) shall be identified in the relocation plan. At least 24 hours before fish relocation begins, the appropriate resource agencies shall be notified to communicate the details of the fish relocation and to confirm disposition instructions.
- Fish shall be relocated under the following conditions:
  - *Setup:* Upon arrival at the site, a qualified biologist shall review the operational sequence and logistics of the rescue and field assignments shall be designated. The fish relocation team shall review safety and operational methods.
  - *Live Well Operation:*
    - If necessary, live wells shall be set up early in the operation to stabilize tank conditions.
    - Local “native” water shall be used to fill live wells, if available and clean.
    - To lessen stress on fish, the temperature in live wells shall be reduced or managed to be compatible with the water temperatures in which the fish were encountered.
    - To ensure that sufficient oxygen is present during the adjustment period, the aeration system shall be started before fish are placed into the live well. When salmonids are placed in the live well, the live well shall be managed to the extent possible so that the dissolved oxygen concentration is greater than 6 milligrams per liter, but less than saturation.
  - *General Collection Guidelines:*
    - Fish shall be collected in a manner to minimize handling time and stress, yet maintain the safety of personnel.

- Multiple buckets and/or live cars shall be used to reduce crowding during collection and transfer.
- Fish shall be pre-sorted as needed for transport.
- Buckets that hold steelhead shall be equipped with portable aerators until the fish are transferred to a live well.

– *Transport:*

- Fish shall be transported to minimize holding time and alternately sequenced in tandem with ongoing collection activities.
- Normal live well operations shall continue during transport.

– *Records and Data:*

- Fish shall be inventoried and pertinent data shall be recorded, including species, numbers of each species, disposition, and fork length. If conditions preclude a complete inventory, at a minimum, the species present and their disposition shall be documented and their abundance shall be estimated.
- Information on ambient site conditions (available habitat/water quality) shall be recorded as appropriate, including photo documentation at collection and release sites and other information on collection, handling, and transport.
- At completion, a qualified biologist shall conduct an assessment of the fish relocation to identify lessons learned, estimate the number of individual fish and fish species moved, and determine the mortality rate. The assessment report shall be forwarded to the appropriate resource agencies within a month of the completion of in-water work.

Western red bat (*Lasiurus blossevillii*) is a California species of special concern. Western red bat is locally common in some areas of California, occurring from Shasta County to the Mexican border, west of the Sierra Nevada. Wintering range includes western lowlands and coastal regions south of San Francisco Bay. There is some migration between summer and winter ranges, but in California most individuals make relatively short migrations. Western red bat mating begins in August and September with births in May through early July. Roosting habitat includes forests and woodlands from sea level up though mixed conifer forests with site selection primarily in trees. Roosts are generally in edge habitats adjacent to streams, fields or urban areas.

There are no CNDDB records for this species within 5.0 miles of the Project site. However, a study in 2018 detected western red bat in the Deer Island Open Space Preserve (One Tam 2018). The trees in the oak woodlands and forested wetlands within the Project site can be considered suitable habitat for roosting. The Project site includes large areas of diked seasonal wetlands, Novato Creek, and ponds that provide suitable foraging habitat for this species. No Western red

bats were observed during the 2020 biological reconnaissance surveys. This species has a moderate potential to roost within the Project site.

Other roosting bats have potential to occur within the Project site. Three bat species, silver-haired bat (*Lasionycteris noctivagans*), hoary bat (*Lasiurus cinereus*), and Yuma myotis (*Myotis yumanensis*), have potential to occur within the Project site and have a medium priority ranking from the Western Bat Working Group. These three bat species were detected at the Deer Island Open Space Preserve in 2018 (One Tam 2018). These bat species inhabit forests and woodlands, may roost in trees, and are usually associated with water sources such as rivers, streams, and ponds, or other open habitats. The forested wetlands and oak woodlands within the Project site provide marginal roosting habitat, while the seasonal wetlands, tidal marsh, tidal channel, and ponds provide open foraging habitat.

Removal of trees with active bat roosts would be considered a significant impact. **Mitigation Measure BIO-9** specifies measures that would avoid or minimize impacts to special-status bat species. These measures include pre-construction surveys for roost sites, methods to minimize impacts to active roosts during construction, and protocols to mitigate for unavoidable impacts to special-status bats. With the implementation of Mitigation Measure BIO-9, impacts to special-status bats would be reduced to a less-than-significant level.

Mitigation Measure BIO-9: Bat Protection

A day-time pre-construction survey shall be conducted by a Qualified Biologist within one (1) year of the tree coming down. Only trees with a diameter at breast height larger than 10-inches shall be treated at potential bat roosting habitat. The survey shall determine if the tree has suitable bat roosting habitat and look for signs of bat use. If no suitable bat roosting habitat is observed, the tree can come down without any other bat protections. If the tree has suitable bat roosting habitat, efforts shall be made to remove the tree outside of the maternity (April 15–August 31) and winter (October 15–March 1) roosting seasons after a night-time bat roosting survey. The night-time bat roosting survey shall take place within seven (7) days of the tree coming down and shall be conducted 30 minutes before and after sunset. If bats are found to be roosting in the tree during that time, a two-step method of removal shall be implemented.

Trees with potential roosting bats that will be removed outside of the maternity and winter roosting seasons, can be removed using a two-step process over two consecutive days (e.g., Monday and Tuesday, or Thursday and Friday). Small branches or limbs that do NOT contain cavities, crevices, or exfoliating bark on the habitat trees, and are identified by a Qualified Biologist, are removed first on Day 1 using a chainsaw. A Qualified Biologist will remain on-site during the Day 1 process to ensure the people who are cutting the tree understand the process and avoid incorrectly cutting potential habitat features or trees. Once the people cutting the trees have had sufficient field supervision and training by the Qualified Biologist, the Qualified

Biologist does not need to remain on site. On the following day, Day 2, the remainder of the tree is to be removed. The disturbance caused by chainsaw noise and vibration, coupled with the physical alteration, has the effect of causing colonial bat species to abandon the roost tree after nightly emergence for foraging. Removing the tree the next day prevents re-habituation and re-occupation of the altered tree.

If the tree cannot be removed outside of the roosting seasons, exclusionary measures shall be put into place on any tree with potential bat roosting habitat, prior to any roosting seasons. The timing and other methods of exclusionary activities shall be developed by the Qualified Biologist in order to reduce the stress on the bats to the amount feasible while taking into account Project schedule. Exclusionary devices, such as plastic sheeting, plastic or wire mesh, may be used to allow for bats to exit but not re-enter any occupied roosts, if applicable. A Qualified Biologist shall also be notified and present during any tree removal or tree trimming.

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 U.S. Fish and Wildlife Service?

Less-than-Significant Impact with Mitigation Incorporated. Natural communities are assemblages of plant species that occur together in the same area and are defined by species composition and relative abundance. Sensitive natural communities are designated by various resource agencies, such as CDFW, or in local policies and regulations, and are generally considered to have important functions or values for wildlife and/or are recognized as declining in extent or distribution and are considered threatened enough to warrant some level of protection. CDFW tracks communities it believes to be of conservation concern through its *California Sensitive Natural Community List* (CDFW 2022b; Sawyer et al. 2009).

Oak woodland areas within the Project site include existing mature mitigation trees that were planted in the 1990s. The oak woodland, which is primarily dominated by valley oak, would be classified by the MCV as *valley oak woodland and forest* (71.040.00). It would mostly be preserved, but up to seven trees may need to be removed where the primary tidal channel would be excavated. These native trees were likely planted in the 1990s. *Valley oak woodland and forest* is a S3 sensitive natural community. Impacts from the loss of up to seven native trees is considered to be potentially significant but can be reduced to a less-than significant level via implementation of **Mitigation Measures BIO-10**.

Mitigation Measure BIO-10: Tree Replacement Requirements

Trees removed or that die due to project impacts, such as root compaction from construction or salinity intrusion, shall be replaced at a 5:1 ratio for native oak trees more than 12 inches in diameter at breast height (DBH) and 3:1 ratio for all other trees more than 12 inches DBH at an ecologically appropriate site identified by the District. Replacement trees shall be

monitored for survival in Years 1, 3, and 5 post-construction. Trees should be sourced from the Novato Creek Watershed if feasible and obtained from a nursery that implements best management practices to reduce chances of pest and pathogen contamination, such as Phytophthora, within their nursery.

The tidal marsh, which is primarily dominated by alkali bulrush would be classified by the MCV as *salt marsh bulrush marsh* (52.112.00). Specifically, mapped tidal marsh areas would fall within either 52.112.03 *Bolboschoenus maritimus* or 52.112.04 *Bolboschoenus maritimus – Salicornia pacifica* MCV vegetation alliances depending on the area. *Salt marsh bulrush marsh* is a S3 sensitive natural community.

Salt marsh bulrush marsh would be subject to losses during construction. Temporary impacts could occur due to disturbance by Project-related equipment, vehicles, the deposition of spoils, or equipment in the areas where the sensitive natural community is present. However, there would be a gain in almost 20 acres of tidal marsh post-project. In addition, with the restoration of the non-tidal ponds to tidal ponds, the newly tidal areas are anticipated to accrete sediment and continue to expand the area of tidal marsh over time and also facilitate the area in becoming more resilient to sea level rise. Although there would be some conversion of tidal marsh to other habitat types, the Project would ultimately increase the amount of tidal marsh by 19.7 acres and increase the ecological function and long-term benefits of 193 acres of tidal wetlands and waters on site, including alkali bulrush habitat. Therefore, the Project would result in less-than-significant impacts on this sensitive natural community.

Streams and lakes, as habitat for fish and wildlife species, are subject to jurisdiction by CDFW under Sections 1600–1616 of California Fish and Game Code. Excavation and dredge material placement would affect areas within CDFW jurisdiction if it occurs within existing wetlands and waters including Novato Creek, Duck Bill Pond, Herons Beak Pond, Deer Island South Basin, and Farmers Basin. These potential impacts are less than significant because the impacts would only be completed to support habitat restoration.

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 Incorporated. Temporary and permanent impacts to federal-protected wetlands and waters would occur as a result of restoration activities involving excavating new tidal channels and the placement of excavated materials in wetlands and waters. Such impacts would be offset by a substantial long-term net gain in area and overall function of wetlands and waters after Project implementation. The Project would improve wetlands and open water habitats in the both the near- and long-term. Wetlands

and waters within the Project site would benefit from improved ecosystem function and flood resilience.

Due to sea level rise, the Project site is also expected to gain future benefits to existing habitats due to increased ecological connectivity and improved tidal hydrology, which would enhance wetlands, waters, and upland areas in and adjacent to the Project site. There would be some conversion of wetland and water types and an overall total gain of approximately 3.0 acres of wetlands and waters. The Project would increase the ecological function and long-term benefits of 193 acres of wetlands and waters on site and due to wetland type conversion, there would be an increase in over 20 acres of tidal marsh. To ensure the success of the habitat conversations, **Mitigation Measure BIO-11** would require development of a monitoring and adaptive management plan. As noted in the mitigation measure, the plan would provide direction in monitoring the development and progress of vegetation and geomorphology. With implementation of this mitigation measure, the Project would result in less-than-significant impacts on wetlands and waters.

> **Mitigation Measure BIO-11: Develop and Implement a Monitoring and Adaptive Management Plan**
>
> The District shall develop and submit a Monitoring and Adaptive Management Plan to be implemented during the monitoring period to assure desired outcomes. The plan shall be submitted to CDFW, the Regional Water Quality Control Board, and the U.S. Army Corps of Engineers prior to the start of construction. Elements of this plan shall be based upon final project design and construction documents. The plan shall include description of protocols for monitoring vegetation and geomorphology to evaluate project performance, monitoring schedule, performance criteria and thresholds that would trigger adaptive management actions, and reporting. A report shall be prepared and provided to the above-listed regulatory agencies in each year that post-construction monitoring is conducted.

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?

Less-than-Significant Impact. Wildlife movement corridors link together areas of suitable wildlife habitat that are otherwise separated by rugged terrain, changes in vegetation, or by areas of human disturbance or urban development. Topography and other natural factors in combination with urbanization can fragment or separate large open-space areas. The fragmentation of natural habitat can create isolated “islands” of vegetation and habitat that may not provide sufficient area to accommodate sustainable populations and can adversely impact genetic and species diversity. The retention of wildlife movement corridors ameliorates the effects of such fragmentation by allowing animals to move between remaining habitats, which in turn allows depleted

populations to be replenished. Such movement may also promote genetic exchange between separated populations.

While ample habitat for wildlife species occurs in the immediate and surrounding the Project site to the south and east, the area is not recognized as being within a major or local wildlife corridor/travel route according to the CDFW's Essential Habitat Connectivity natural landscape blocks (CDFW 2017). The Project site has predominantly limited connectivity opportunity since the upland areas surrounding the Project site are developed neighborhoods and/or highways. Most of the Project site is designated by CDFW as Areas of Conservation Emphasis (ACE) Rank 1 lands which are considered lands with limited connectivity opportunity. The Project site is located over 5.0 miles to the south of Olompali State Historic Park and the Petaluma Valley, which are the closest natural landscape block to the Project site (CDFW 2017).

The Project would not substantially adversely interfere with the movement of any native terrestrial or aquatic resident or migratory wildlife species or with an established native resident or migratory wildlife corridor or impede the use of a native wildlife nursery site. Construction may temporarily impede wildlife from using the site, but this would be temporary and not significant. Therefore, the Project would result in less-than-significant impacts on wildlife movement.

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

Less-than-Significant Impact with Mitigation Incorporated. The City of Novato General Plan 2035 and the Novato Municipal Code include a number of policies related to wetland, creek, and tree protection and mitigation, to address potential loss of wetlands or trees that may be caused by development; however, those policies do not directly pertain to this Project, which is a wetland and habitat restoration project. Along Duck Bill Pond, 2,800 linear feet of levee lowering is proposed in a selective manner that preserves the existing oak and other native trees along the levee, however up to seven native trees (likely Coast live oak and black walnut trees) would need be removed at the primary tidal channel breach location.

The native trees to be removed would be replaced as part of the Project in accordance with regulatory agency requirements. Impacts from the loss of trees is considered to be potentially significant but can be reduced to a less-than significant level via implementation of Mitigation Measure BIO-10 (above).

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. No adopted habitat conservation plan or natural community conservation plan covers the Project terrestrial or marine areas, and there are no protected significant or landmark trees on the Project site. The project is consistent with the Novato Creek Baylands Vision (SFEI-ASC, 2015). Thus, no impact related to conflict with policies or plans protecting biological resources is expected to result from Project implementation.

5. Cultural Resources

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

Discussion

CEQA Guidelines Section 15064.5 requires the lead agency to consider the effects of a project on historical resources. An historical resource is defined as any building, structure, site, or object listed in or determined to be eligible for listing in the California Register of Historical Resources (California Register) or determined by a lead agency to be significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, or cultural annals of California. Tribal cultural resources are described separately in Section VI.18.

This section relies on the information and findings presented in the Project's confidential cultural resources technical report: *Deer Island Tidal Wetlands Restoration Project, Novato, Marin County, California: Cultural Resources Inventory Report* (Hoffman and Cleveland, 2022). The report included an overview of the environmental, ethnographic, and historic background of the Project site, with an emphasis on aspects related to human occupation. The confidential report is included by reference to this document. State law prohibits the public dissemination of locational and other information on known cultural resources.

This analysis describes archaeological resources, both as historical resources according to CEQA Guidelines Section 15064.5, and as unique archaeological resources, as defined in PRC Section 21083.2(g).

Records Search

The results of a cultural resources records search at the Northwest Information Center (NWIC) of the California Historical Resources Information System (CHRIS) were received in December 2020. The review included all areas within 0.5 mile of the Project site. The NWIC records search identified one previously recorded cultural resource (P-21-000199) within the Project site. Fourteen additional cultural resources have been previously recorded within 0.5 mile of the Project site.

Native American Correspondence

On behalf of the District, ESA contacted the California Native American Heritage Commission (NAHC) in December 2020, to request a search of the NAHC's Sacred Lands File (SLF) and a list of representatives from California Native American Tribes who may have knowledge of cultural resources in the vicinity of the Project site or interest in the Project. The NAHC replied to ESA in January 2021, with the statement that the SLF has record of a sacred site at the Project site and to contact the Federated Indians of Graton Rancheria (FIGR) regarding the resource. The NAHC's response also included a list of representatives from California Native American Tribes to contact regarding these resources and who may be interested in the Project.

In support of required Native American consultation for the Project pursuant to PRC Section 21080.3 (i.e., Assembly Bill 52), the District sent letters in March 2021 to the representatives from the following California Native American Tribes: FIGR and Ione Band of Miwok Indians. These letters provided information on the Project and requested that the recipients notify the District if they would like to consult pursuant to PRC Section 21080.3. The District also sent a letter, in September 2021, to the Coast Miwok Tribal Council of Marin (CMTCM) with information on the Project and requesting that the CMTCM notify the District if they are concerned about any potential Project impacts on cultural resources. The only responses received from these letters were from the FIGR, stating that the FIGR formally requests consultation on the Project pursuant to PRC Section 21080.3, and from the CMTCM, stating that the CMTCM would like to consult with the District on the Project.

The District has conducted individual conference calls with both the FIGR and the CMTCM regarding the Project. These calls included presentations and information on the Project, a review of cultural resources studies conducted for the Project to date, and open discussions regarding Tribal concerns on potential Project impacts on cultural resources. The District also sent the CHRIS results for the Project to the FIGR for review. The District and the CMTCM conducted a site visit to review the Project and overall Project site. Consultation between the District and the FIGR is ongoing, as are communications between the District and the CMTCM.

Field Survey

ESA completed pedestrian surveys of the Project site on May 26 and August 26, 2022. During the pedestrian surveys, ESA identified archaeological material consistent with what was previously recorded at P-21-000199 and newly recorded five archaeological resources and seven architectural resources in the Project site. The newly recorded archaeological resources consist of: wooden bridge remnants (ESA-DI-03) and four different wooden fence remnants (ESA-DI-04, ESA-DI-05, ESA-DI-06, ESA-DI-08). The newly recorded architectural resources consist of: five earthen levees (Deer Island Cross Levee, Duck Bill Levee, Heron's Beak Levee, Novato Creek Left Bank Levee, West Basin Cross Levee), one electric transmission line (ESA-DI-02), and one earthen berm (ESA-DI-07).

Summary of Cultural Resources Identified

Through background research and a field survey, 13 cultural resources (P-21-000199, ESA-DI-02, ESA-DI-03, ESA-DI-04, ESA-DI-05, ESA-DI-06, ESA-DI-07, ESA-DI-08, Deer Island Cross Levee, Duck Bill Levee, Heron's Beak Levee, Novato Creek Left Bank Levee, West Basin Cross Levee) were identified in the Project site. All 13 of these cultural resources were recommended not eligible for the California Register. Also, of these 13 cultural resources, the six archaeological resources were recommended as not qualifying as unique archaeological resources, pursuant to CEQA (Hoffman and Cleveland, 2022). In summary, no cultural resources that qualify as historical resources or unique archaeological resources, as defined by CEQA, were identified in the Project site.

a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?

No Impact. Seven architectural resources 50 years of age or older have been identified in the Project site. All of these have been evaluated as not eligible for the California Register and, therefore, do not qualify as historical resources according to CEQA Guidelines Section 15064.5. As a result, the Project is not anticipated to impact any historical resources and no mitigation is required.

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

Less-than-Significant Impact with Mitigation Incorporated. Six archaeological resources have been identified in the Project site. All of these have been evaluated as not eligible for the California Register and also as not qualifying as unique archaeological resources, as defined in PRC Section 21083.2(g). Therefore, there are no known archaeological resources, pursuant to CEQA Guidelines Section 15064.5, in the Project site and the Project is not anticipated to impact any such known resources.

However, because the Project includes ground-disturbing activities, there is the potential for the discovery of unrecorded buried archaeological resources during construction. Additionally, as per Hoffman and Cleveland (2022), the historic-era levees identified in the Project site have the potential to contain archaeological resources. Ground disturbance of the levees, including breaching and degrading activities, may impact as-of-yet unidentified archaeological resources, if any are present, within the levee. If any previously unrecorded archaeological resources are identified during Project construction and are found to qualify as an historical resource, as defined in CEQA Guidelines Section 15064.5, any impacts to the resource resulting from the Project could be potentially significant. Any such potential significant impacts would be reduced to a less-than-significant level with implementation of Mitigation Measures CUL-1 and CUL-2, as well as compliance with the City of Novato Municipal Code Sections 4-7.3(b), 4.7.5, and 4.7-6, which require, upon an unanticipated discovery of archaeological resources, halting of

all activities that may disturb the resource and requesting an archaeological investigation permit from the City of Novato, procedures for treatment of excavated archaeological material and associated reporting, and penalties for noncompliance these requirements.

Mitigation Measure CUL-1: Cultural Resources Awareness Training

Before any ground-disturbing and/or construction activities, an archaeologist meeting, or under the supervision of an archaeologist meeting, the Secretary of the Interior's Professional Qualifications Standards (SOI PQS) for Archeology shall conduct a training program for all construction and field personnel involved in Project-related ground-disturbing activities. If a California Native American Tribe expresses interest, they shall be invited to participate in the training program. On-site personnel shall attend the training prior to commencement of any ground-disturbing activities. The training shall outline the general archaeological sensitivity of the Project site and the procedures to follow in the event an archaeological resource and/or human remains are inadvertently discovered. Documentation of the training attendance shall be maintained by the District.

Mitigation Measure CUL-2: Cultural Resources Construction Monitoring

An archaeologist meeting the SOI PQS for Archeology shall prepare a Cultural Resources Monitoring Plan to describe the locations, methods (including inadvertent discovery protocol [i.e., City of Novato Municipal Code Sections 4-7.3(b), 4.7.5, and 4.7-6]), and reporting for cultural resources construction monitoring. The construction monitoring shall focus on Project-related ground-disturbing activities within existing levee prisms, and shall include, at a minimum, spot-checks of the major ground-disturbing Project-related activities. The monitoring shall be conducted by an archaeologist meeting, or under the supervision of an archaeologist meeting, the SOI PQS for Archeology. Daily monitoring logs shall be prepared detailing the monitoring activities and findings. If the District deems it necessary, they may invite a California Native American Tribe to participate in the construction monitoring. A Cultural Resources Monitoring Results Report (CRMRR) summarizing the results of the monitoring shall be prepared by an archaeologist meeting the SOI PQS for Archeology. The CRMRR shall be submitted to the NWIC upon District review and approval. If any archaeological resources are inadvertently discovered during Project-related construction activities, the procedures outlined in the including inadvertent discovery protocol for archaeological resources and human remains (see City of Novato Municipal Code Sections 4-7.3(b), 4.7.5, and 4.7-6, and Mitigation Measure TRI-1) shall be followed.

c) Disturb any human remains, including those interred outside of formal cemeteries?

Less-than-Significant Impact. Archival research and field survey results did not find any evidence of the presence of human remains in the Project site. Also, the land use designations for the Project site do not include cemetery uses and no known cemeteries are located within the Project site. Therefore, no human

remains are believed to be present in the Project site. While unlikely, it is possible that human remains could be encountered during Project-related construction. If any such resources were encountered and were damaged or disturbed as a result of the Project, the impact would be potentially significant. This potential significant impact would be reduced to a less-than-significant level with compliance with PRC Section 5097.98, California Health and Safety Code Section 7050.5, and the City of Novato Municipal Code Section 4-7.5, that identify steps to follow in the event of the accidental discovery or recognition of any human remains in any location other than a dedicated cemetery, as well as establish reporting requirements associated with treatment of Native American skeletal remains, and establish penalties for noncompliance with these requirements.

6. Energy

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

Discussion

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

This analysis utilizes the energy input assumptions used to complete the analyses in Section VI.3, *Air Quality*, and Section VI.8, *Greenhouse Gas Emissions*. Because the California Emissions Estimator Model (CalEEMod) program, which was used for those analyses, does not quantify the fuel volume or type for construction-related sources, additional calculations were completed and are summarized below.

Project Construction

Less-than-Significant Impact. The Project's construction would consume energy in the form of diesel and gasoline fuels to power construction tools and equipment, truck trips to haul material, and vehicle trips generated from construction workers commuting to and from the site. Project construction is expected to consume a total of approximately 382,835 gallons of diesel fuel and 15,435 gallons of gasoline fuel from construction equipment and vendors, hauling, and commuting construction workers over four successive construction seasons.

Most of the energy used during construction would be used to power equipment to transport materials (i.e., rock, gravel, sediment) used for new levees and berms within the Project site and excavating within the Novato Creek marshplain. No additional electrical infrastructure is proposed or required with the Project.

Construction activities and corresponding fuel energy consumption would be temporary and localized, as the use of diesel fuel and heavy-duty equipment would not be a long-term condition of the Project. In addition, there are no unusual Project characteristics that would cause the use of construction equipment or haul vehicles that would be less energy efficient compared with other similar construction sites in other parts of the State. In conclusion, construction-related fuel consumption by the Project would not result in inefficient, wasteful, or unnecessary energy use compared with other

construction sites in the region. The impact on energy resources during the construction phase of the Project would be less than significant.

Project Operation

Less-than-Significant Impact. Operation and maintenance of the Project is not anticipated to increase consumption of diesel or gasoline fuel. Following construction of the Project, this portion of Deer Island Basin would be maintained in a manner consistent with existing conditions (e.g., levee maintenance, water control structure inspection and maintenance, etc.). Thus, energy use would not increase, nor would it be wasteful, inefficient, or unnecessary for construction or operation of the Project. Impacts associated with temporary increases in fuels associated with construction of the Project would be less than significant.

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

No Impact. The transportation sector is a major end-user of energy in California, accounting for approximately 39 percent of total statewide energy consumption in 2014 (US Energy Information Administration, 2016). In addition, energy is consumed in connection with construction and maintenance of transportation infrastructure, such as streets, highways, freeways, rail lines, and airport runways. California's 30 million vehicles consume more than 16 billion gallons of gasoline and more than 3 billion gallons of diesel each year, making California the second largest consumer of gasoline in the world (CEC, 2016).

Existing standards for transportation energy are promulgated through the regulation of fuel refineries and products, such as the Low Carbon Fuel Standard, which mandated a 10 percent reduction in the non-biogenic carbon content of vehicle fuels by 2020. In 2018, the California Air Resources Board (CARB) approved amendments to the regulation, which included strengthening and smoothing the carbon intensity benchmarks through 2030 in line with California's 2030 greenhouse gas (GHG) emission reduction target enacted through SB 32, adding new crediting opportunities to promote zero emission vehicle adoption, alternative jet fuel, carbon capture and sequestration, and advanced technologies to achieve deep decarbonization in the transportation sector. Additionally, there are other regulatory programs with emissions and fuel efficiency standards established by USEPA and CARB such as Pavley II/LEV III from California's Advanced Clean Cars Program and the Heavy-Duty (Tractor-Trailer) GHG Regulation. CARB has set a goal of 4.2 million Zero Emissions Vehicles (ZEV) on the road by the year 2030 (CARB, 2016). Further, construction sites will need to comply with State requirements designed to minimize idling and associated emissions, which also minimizes use of fuel. Specifically, idling of commercial vehicles and offroad equipment would be limited to five minutes in

accordance with the Commercial Motor Vehicle Idling Regulation and the Off-Road Regulation.[10]

The Environmental Stewardship Element of the City of Novato General Plan contains goals and policies to that focus on the protection, maintenance and enhancement of Novato's natural resources and open spaces (City of Novato, 2020). This largely passive open space restoration Project is consistent with those goals. Although the Project's construction would include the use of fuels to transport rock, gravel, and sediment for levees and berms, the Project would not interfere or obstruct the implementation of City energy efficiency policies. The Project would comply with all State and local plans for vehicle fuel efficiency because all vehicles and machinery that are sold within California are required to meet those standards. Therefore, the Project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. Under this criterion, there would be no impact.

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[10] California Code of Regulations, 2005. Title 13, Chapter 10, 2485, updated through 2014.

7. Geology and Soils

Would the project:	Significant or Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
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.	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on 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?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	☒	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☒	☐

Discussion

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.

No Impact. The Project is not located on an active fault (CGS 2010, 2022), defined as a fault that has experienced surface rupture within the last 11,700 years (CGS 2018). The nearest active faults are the Hayward – Rodgers

Creek Fault Zone located about four miles to the east and the San Andreas Fault Zone located about 12 miles to the west. There are also no Alquist-Priolo fault zones mapped on the Project site. Relative to being located on an active fault or within an Alquist-Priolo fault zone, there would be no impact.

ii) Strong seismic ground shaking?

Less-than-Significant Impact. As noted above in Impact (a)(i), the Project site is located in a seismically active region and is expected to be subjected to seismic shaking from earthquakes. The Working Group on California Earthquake Probabilities (WGCEP), comprised of the U.S. Geological Survey (USGS), the California Geological Survey (CGS), and the Southern California Earthquake Center, evaluates the probability of one or more earthquakes of magnitude (Mw) 6.7 or higher occurring in California over the next 30 years. It is estimated that the San Francisco Bay Area as a whole has a 72 percent chance of experiencing an earthquake of Mw 6.7 or higher over the next 30 years (Field et al 2015). Therefore, the Project site is expected to be subjected to seismic shaking.

As noted in Impact (a)(i), the Project site is not located on an active fault and does not include activities that would directly or indirectly cause movement on a fault, such as the injection or extraction of water, crude oil, or natural gas (the injection or extraction of fluids or gas could cause a change in pressure conditions which could trigger movement on a fault). In addition, the Project does not include the construction of habitable structures that would require being constructed to withstand seismic shaking as required by the California Building Code. The site is located in a seismically active area that could experience severe shaking (MTC/ABAG 2022). Seismic shaking could damage some levees and might result in temporary localized flooding. However, given the undeveloped condition of the Project site and adjacent downstream areas, other than SR 37, the impacts of flooding would be temporary and limited, and the levees could be easily repaired. Therefore, impacts relative to seismic shaking would be less than significant.

iii) Seismic-related ground failure, including liquefaction?

Less-than-Significant Impact. Liquefaction is the rapid loss of shear strength experienced in saturated, predominantly granular soils below the groundwater level during strong earthquake groundshaking and occurs due to an increase in pore water pressure. Liquefaction-induced lateral spreading is defined as the finite, lateral displacement of gently sloping ground as a result of pore-pressure buildup or liquefaction in a shallow underlying deposit during an earthquake (VT 2013). The occurrence of this phenomenon is dependent on many complex factors, including the intensity and duration of groundshaking, particle-size distribution, and density of the soil. The potential

damaging effects of liquefaction include differential settlement, loss of ground support for foundations, ground cracking, heaving and cracking of structure slabs due to sand boiling, and buckling of deep foundations due to ground settlement. Dynamic settlement (i.e., pronounced consolidation and settlement from seismic shaking) may also occur in loose, dry sands above the water table, resulting in settlement of and possible damage to overlying structures. In general, a relatively high potential for liquefaction exists in loose, sandy soils that are within 50 feet of the ground surface and are saturated (below the groundwater table). Lateral spreading can move blocks of soil, placing strain on levees and roads that can lead to ground failure.

Soils at the Project site consist of mostly of the Reyes Clay, which does not have sand layers (NRCS 2022). In addition, the CGS has not designated this area as susceptible to liquefaction (CGS 2022). Therefore, the Project site is not expected to be susceptible to liquefaction and the impact would be less than significant.

iv) Landslides?

No Impact. The Project site is relatively flat with no steep slopes. The CGS has not designated this area as susceptible to landslides (CGS 2022). Therefore, the Project site is not susceptible to landslides and there would be no impact.

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

Less-than-Significant Impact. The Project would consist of the improvement of levees, creek channels, and basins with some additional improvements to tidal gates, as well as construction of transitional ecotone levees and habitat berms. Flooding events can lead to topsoil loss and erosion throughout the floodplain by washing sediment away at higher rates than normal. Construction efforts would include soil-moving measures such as excavation and stockpiling as a part of staging in between construction phases. Given that the construction would occur over an area over one (1) acre, a Stormwater Pollution Prevention Plan (SWPPP) would be required for Project construction activities in compliance with the National Pollutant Discharge Elimination System (NPDES) Construction General Permit requirements. A SWPPP would include Best Management Practices (BMPs) and other protocols that would prevent site runoff, erosion, and loss of topsoil. BMPs may include silt fences, straw wattles, and other measures. in addition, the Project site is relatively flat with no steep slopes. The improvements would result in the restoration of the Project site in a manner that would improve flow through the area that would include reducing levee overtopping and flooding that currently occurs. Consequently, reducing the likelihood of flood events would reduce the potential for erosion and loss of top soil, and the impacts would be less than significant.

c) Be located on 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?

Less-than-Significant Impact. The analyses for impacts from landslides, liquefaction, and lateral spreading are addressed above in Questions (a)(iii) and (a)(iv), which concluded impacts would be less than significant or no impact.

Collapse of the land surface is typically associated with voids in the shallow subsurface into which the overlying sediment collapse into. Subsidence of land surface is also associated with the pumping of groundwater or crude oil at a rate that causes the subsidence of the land surface. The Project does not include the extraction of groundwater and would not cause voids. In addition, the Project would improve many of the levees to be more functional and improve the flow through Novato Creek, which would result in the levees being less prone to overtopping that could have eroded an area in such a manner as to result in a void. Therefore, relative to collapse, the impact would be less than significant.

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?

Less-than-Significant Impact. Expansive soils are soils that possess a “shrink-swell” characteristic, also referred to as linear extensibility. Shrink-swell is the cyclic change in volume (expansion and contraction) that occurs in fine-grained clay sediments from the process of wetting and drying; the volume change is reported as a percent change in volume for the whole soil. This cyclical change in soil volume is measured using the coefficient of linear extensibility (COLE) (Natural Resources Conservation Service [NRCS] 2022). If the linear extensibility percent is more than 3 percent (COLE = 0.03), shrinking and swelling may cause damage to buildings, roads, and other structures, such as levees. Structural damage may occur incrementally over a long period of time, usually as a result of inadequate soil and foundation engineering or the placement of structures directly on expansive soils. Soil expansion generally occurs in fine-grained clayey sediment, which as previously noted in Question (a)(iii), is the predominant soil within the Project site.

However, as discussed in Section II.F, *Project Description*, the Project does not include the construction of any habitable or large structures. The Project would consist of the restoration of levees and basins, as well as the creation of transitional ecotone levees and improvements to tidal gates. The Project would result in the ecotone and basin areas regularly remaining inundated; no wetting-drying cycles would occur that would encourage shrink/swell. The levees may shrink and swell to some small degree, but there would be no structures on the levees to be damaged. Therefore, relative to expansive soils, the 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 Project does not include the use of septic tanks or alternative wastewater disposal systems. There would be no impact.

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

Less-than-Significant Impact. The Project would consist of the restoration of levees, ecotone, and basins with some improvements to tidal gates. All of the ground disturbing activities would be at the surface; no deep excavations would occur. Although Holocene deposits (i.e., the surface soils at the Project site) can contain remains of plants and animals, generally not enough time has passed for the remains to become fossilized (i.e., 5,000 years; SVP 2010). In addition, the remains are conspecific (generally of the same species) with modern species and are usually not considered scientifically important. Therefore, relative to paleontological resources, impacts would be less than significant.

8. Greenhouse Gas Emissions

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

Discussion

The most recently adopted plan to address Greenhouse Gas (GHG) issues for the Bay Area is the 2017 CAP (BAAQMD, 2017c). The 2017 CAP provides a regional strategy to protect the climate by transitioning the region to a post-carbon economy needed to achieve GHG reduction targets for 2030 and 2050; and providing a regional climate protection strategy that will put the Bay Area on a pathway to achieve those GHG reduction targets. The 2017 CAP includes a wide range of control measures to reduce emissions of methane and other "super-GHGs"[11] that are potent climate pollutants in the near-term; and to decrease emissions of carbon dioxide by reducing fossil fuel combustion (BAAQMD, 2017c).

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

Less-than-Significant Impact. Construction activities that would be associated with the Project would include site preparation, levee removal, new levee construction, marshplain and interior tidal channel excavation, handling of excess material. Construction activities are assumed to occur over a period of approximately four years, between May 2024, and November 2027. The majority of the Project-related GHG emissions would be generated on-site due to the use of heavy-duty off-road equipment and a smaller amount of emissions would be generated off-site from trucks transporting equipment and material to the site, as well as work commuters. The BAAQMD currently has no formal significance threshold for GHG emissions from construction activities as discussed below.

In the 2017 BAAQMD CEQA Guidelines recommend an operational significance threshold of 1,100 metric tons per year of CO2e (BAAQMD, 2017c). BAAQMD has not adopted significance thresholds for construction-related GHGs; however, it requires that the lead agency disclose those emissions and make a determination of impacts in relation to meeting AB 32 reduction goals. For construction-related GHGs, other air districts (e.g., South Coast Air Quality

[11] "Super-GHGs" are climate pollutants that have a powerful ability to contribute to global warming such as methane, black carbon, and fluorinated gases

Management District) have recommended that total emissions from construction be amortized over 30 years, representing the lifetime of a project, and added to operational emissions and then compared to the operations significance threshold (SCMQD, 2008).

GHG emissions from construction activities were estimated using the CalEEMod and EMFAC emissions models with the same assumptions as discussed in Section VI.3, *Air Quality*. The results of the CalEEMod and EMFAC runs indicate that the Project would generate a total of approximately 12,298 pounds, or 2040 metric tons, of CO_2e over the approximately four-year construction period. Amortized over an estimated project life of 30 years, the annual GHG emissions from Project construction would be 68 metric tons of CO_2e. Refer to Appendix A for all assumptions used to estimate project-related GHG emissions.

The sum of Project construction and operational GHG emissions would be approximately 68 metric tons CO_2e per year. The Project would be well below the 1,100 metric tons CO_2e per year significance threshold. Therefore, the Project would not generate GHG emissions that may have a significant impact on the environment. This 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?

Less-than-Significant Impact with Mitigation Incorporated. CEQA Guidelines Section 15183.5 allows public agencies to analyze and mitigate GHG emissions as part of a larger plan for the reduction of GHGs. The Project site is located in the City of Novato, which adopted the Climate Change Action Plan (CCAP) in 2009. The CCAP sets GHG reduction targets and measures that were then inserted into the City of Novato General Plan 2035 in 2020.

The majority of the measures discussed in the CCAP are aimed at reducing energy use, water use, and waste reduction in buildings and commercial developments. The Project would not include any structures; therefore, many of the measures discussed in the CCAP would not be applicable to the Project. The only CCAP measure that would be applicable to the Project is measure 13, which reduces idling time for heavy-duty trucks beyond what is required by the California Air Resources Board. As discussed in Section VI.3, *Air Quality*, the Project would implement **Mitigation Measure AQ-1: Implement BAAQMD Basic Construction Mitigation Measures**, which includes provisions to minimize idling times by either shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485, of California Code of Regulations [CCR]). Thus, the Project would be consistent with applicable measures described in the CCAP and the Project would not conflict with a plan, policy, or regulation adopted for the purpose of reducing GHG emissions; the impact would be considered less than significant with mitigation incorporated.

The project's emissions of CO_2e represent a negligible amount when compared to the total annual GHG emissions generated for the City of Novato. Furthermore, the project GHG emissions from construction would be a one-time occurrence and would not continually contribute to the City's annual emissions, nor would it hinder the City's progress towards its reduction targets. Therefore, operational emissions would not result in the project conflicting with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. This impact would be less than significant.

With regard to consistency with the applicable air district plan, the BAAQMD's 2017 Clean Air Plan (2017 CAP) contains 85 control measures aimed at reducing air pollution in the Bay Area. As discussed in Section VI.3, Question a, the 2017 CAP does not contain any measures specific to habitat restoration or flood resiliency projects and, therefore, no inconsistency with the 2017 CAP is identified. This impact would be less than significant.

Mitigation Measure AQ-1: Implement BAAQMD Basic Construction Mitigation Measures

Please refer to Section VI.3, *Air Quality*, for full description of Mitigation Measure AQ-1.

9. Hazards and Hazardous Materials

Would the project:	Significant or Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
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?	☐	☐	☐	☒
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?	☐	☐	☐	☒
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐

Discussion

a), b) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of, or through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Construction

Less-than-Significant Impact. During the construction phase, construction equipment would use fuels, oils, and lubricants, which are all commonly used in construction. The routine use or an accidental spill of hazardous materials could result in inadvertent releases, which could adversely affect construction workers and the environment.

Construction activities would be required to comply with numerous hazardous materials regulations designed to ensure that hazardous materials are transported, used, stored, and disposed of in a safe manner to protect worker safety, and to reduce the potential for a release of construction-related fuels or other hazardous materials into the environment, including stormwater and

downstream receiving water bodies. Contractors would be required to prepare and implement hazardous materials business plans (HMBPs) as per the California Hazardous Materials Release Response Plan and Inventory Law of 1985 that requires that hazardous materials used for construction would be used properly and stored in appropriate containers with secondary containment to contain a potential release. The California Fire Code would also require measures for the safe storage and handling of hazardous materials.

Because the Project site is larger than 1.0 acre, a Stormwater Pollution Prevention Plan (SWPPP) would be required for Project construction activities in compliance with the National Pollutant Discharge Elimination System (NPDES) Construction General Permit requirements (SWRCB Order 2009-0009-DWQ). The SWPPP would list the hazardous materials (including petroleum products) proposed for use during construction; describe spill prevention measures, equipment inspections, equipment and fuel storage; protocols for responding immediately to spills; and describe best management practices (BMPs) for controlling site runoff. Specifically, in areas where the excavation would be adjacent to the creek channel, silt curtains and/or straw wattles would be installed to contain turbidity and sediment resulting from construction activity and exclude fish from accessing the active construction area.

The transportation of hazardous materials would be regulated by the U.S. Department of Transportation (USDOT), California Department of Transportation (Caltrans), and the California Highway Patrol (CHP). Together, federal and state agencies determine driver training requirements, load labeling procedures, and container specifications designed to minimize the risk of accidental release.

Finally, in the event of a spill that releases hazardous materials at the Project site, a coordinated response would occur at the federal, state, and local levels. The Marin County Hazardous Materials Response Team (HMRT) is a joint-powers authority team which responds to significant hazardous materials incidents. In the event of a hazardous materials spill, the Marin County Fire Department would be notified and sent to the scene to respond and assess the situation.

The required compliance with the laws and regulations discussed above governing the transportation, use, handling, and disposal of hazardous materials would limit the potential for hazardous conditions due to the use or accidental release of hazardous materials. Therefore, the impact would be less than significant.

Operational Impacts

No Impact. Once constructed, the Project site would function as restored natural habitat and would not require the use of hazardous materials. Therefore, there would be no impact.

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

No Impact. There are no schools within 0.25 mile of the Project site. The nearest school is Lynwood Elementary School at 1320 Lynwood Drive, about 0.6 miles west of the Project site. Therefore, there would be no impact.

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?

No Impact. The Project site is not included on list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 (Cortese List) (RWQCB/DTSC 2022). Therefore, there would be no impact.

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. There are no airports or airstrips within 2 miles of the Project site. The nearest airport is Gnoss Field located approximately 2.6 miles north of the Project site. Therefore, there would be no impact.

f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Less-than-Significant Impact. All construction would occur within the Project site, which is not located on public roads. All hauling trips (12 hauls per truck) would occur on site, and therefore not interfere with an emergency response or evacuation plan. There will be a maximum of approximately 80 trips to and from the site daily composed of both construction trucks and commuters. This project does not require any full or partial lane closures and public access is currently limited in Deer Island Basin. Therefore, the Project would not interfere with an adopted emergency response plan or emergency evacuation plan, and the impact would be less than significant.

10. Hydrology and Water Quality

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

Discussion

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?

Less-than-Significant Impact. The Project would restore floodplain and tidal connectivity, improve habitat conditions, and improve flood control by increasing hydraulic conveyance of flood flows within the Novato Creek channel. During construction, excavators would be used to reconfigure the levees, creek channel, and basins, as well as create transitional ecotone levees. The powered equipment would use fuel and lubricating oil. Otherwise, no other chemicals would be used since no structures would be constructed (i.e., no paint, thinners, glues, adhesives, or asphalt would be used). No herbicides would be applied, as well. Construction of the Project would have the potential to result in soil erosion during excavation, grading, trenching, and soil stockpiling and management. The

grading and excavation activities could release sediment, fuel, or oil to the environment.

Because the overall footprint of construction activities would exceed 1.0 acre, the Project would be subject to the *NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities* (Order 2009-0009-DWQ, NPDES No. CAS000002; as amended by Orders 2010-0014-DWQ and 2012-006-DWQ) (Construction General Permit). The Construction General Permit regulates discharges of sediment and pollutants in stormwater associated with construction activity to waters of the U.S. from construction sites that disturb 1.0 acre or more of land surface, or that are part of a common plan of development or sale that disturbs more than 1.0 acre of land surface. The permit regulates stormwater discharges associated with construction or demolition activities, such as clearing and excavation; construction of buildings; and linear underground projects, including installation of water pipelines and other utility lines.

The Construction General Permit requires that construction sites be assigned a Risk Level of 1 (low), 2 (medium), or 3 (high), based both on the sediment transport risk at the site for the activity and the receiving waters risk during periods of soil exposure (e.g., grading and site stabilization). The sediment risk level reflects the relative amount of sediment that could potentially be discharged to receiving water bodies and is based on the nature of the construction activities and the location of the site relative to receiving water bodies. The receiving waters risk level reflects the risk to the receiving waters from the sediment discharge. Depending on the risk level, the construction projects could be subject to the following requirements:

- Effluent standards;
- Good site management “housekeeping”;
- Non-stormwater management;
- Erosion and sediment controls;
- Run-on and runoff controls;
- Inspection, maintenance, and repair; or
- Monitoring and reporting requirements.

The Construction General Permit requires the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP) that includes specific best management practices (BMPs) designed to prevent sediment and pollutants from contacting stormwater from moving off site into receiving waters. The BMPs fall into several categories, including erosion control, sediment control, waste management and good housekeeping, and are intended to protect surface water quality by preventing the off-site migration of eroded soil and construction-related

pollutants from the construction area. Routine inspection of all BMPs is required under the provisions of the Construction General Permit. In addition, the SWPPP is required to contain a visual monitoring program, a chemical monitoring program for non-visible pollutants, and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment.

The SWPPP must be prepared before the construction begins. The SWPPP must contain a site map(s) that delineates the construction work area, existing and proposed buildings, parcel boundaries, roadways, stormwater collection and discharge points, general topography both before and after construction, and drainage patterns across the Project site. The SWPPP must list BMPs and the placement of those BMPs that the applicant would use to protect stormwater runoff. Additionally, the SWPPP must contain a visual monitoring program; a chemical monitoring program for “non-visible” pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment. Examples of typical construction BMPs include scheduling or limiting certain activities to dry periods, installing sediment barriers such as silt fence and fiber rolls, and maintaining equipment and vehicles used for construction. Non-stormwater management measures include installing specific discharge controls during certain activities, such as paving operations, vehicle and equipment washing and fueling. The Construction General Permit also sets post-construction standards (i.e., implementation of BMPs to reduce pollutants in stormwater discharges from the site following construction).

In the Project site, the Construction General Permit is implemented and enforced by the San Francisco Bay Regional Water Quality Control Board (RWQCB), which administers the stormwater permitting program. Dischargers must electronically submit a Notice of Intent and Permit Registration Documents to obtain coverage under this Construction General Permit. Dischargers are to notify the RWQCB of violations or incidents of non-compliance, and submit annual reports identifying deficiencies in the BMPs and explaining how the deficiencies were corrected. The risk assessment and SWPPP must be prepared by a State Qualified SWPPP Developer, and implementation of the SWPPP must be overseen by a State Qualified SWPPP Practitioner or Developer. A Legally Responsible Person, who is legally authorized to sign and certify permit registration documents, is responsible for obtaining coverage under the permit.

With the required compliance with the Construction General Permit, sediment and other pollutants would be prevented from entering surface waters and impacts relative to water quality would be less than significant.

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 does not include the use of groundwater. The Project would involve a substantial amount of earthmoving to improve levees and restore basins, as well as create transitional ecotone levees and install water control structures. This would not include the construction of impervious surfaces that would prevent groundwater recharge. Therefore, relative to groundwater supplies and sustainable management of the basin, there would be no impact.

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;

Less-than-Significant Impact. As discussed in Section II.F, *Project Description*, the Project would change the existing drainage pattern within the Project site to restore floodplain and tidal connectivity, improve habitat conditions, and improve flood control by increasing hydraulic conveyance of flood flows within the Novato Creek channel. The carrying capacity of Novato Creek would be increased, thus reducing existing erosion conditions, such as the occasional overtopping of levees. Ecotones would be created between the levees and basins to reduce erosive energy and protect the levees. In addition, as discussed above in Question b, the Project would be required to comply with the Construction General Permit, which would include the preparation and implementation of a SWPPP to prevent sediment and other pollutants from entering surface waters. The BMPs of the SWPPP include controlling erosion thru the use of silt curtains, straw wattles, and other BMPs. With implementation of the Project design to improve the flow of surface water through the Project site and the required compliance with the Construction General Permit, impacts relative to substantial erosion or siltation would be less than significant.

ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;

Less-than-Significant Impact. As discussed in Section II.F, *Project Description*, the Project would include increasing hydraulic conveyance of flood flows within the Novato Creek channel. The improvements to the conveyance capacity of Novato Creek would reduce the potential for flooding by more efficiently carrying stormwater to the San Francisco Bay, thus reducing the potential for flooding in upland areas that are drained by Novato Creek.

Expanding the Novato Creek corridor and connecting the creek to the Bird Ponds reduces 50-year design flood levels by as much as 0.24 feet along developed areas upstream of the Project site (i.e., from just downstream of the SMART rail crossing to upstream of Redwood Boulevard). Just upstream of SR 37, water levels under existing conditions can overtop the levee and the creek is constrained by the existing railroad crossing, design water levels rise by as much as 0.84 feet. To address this rise in water surface elevation, the project will improve the Lynwood Basin levee and Novato Creek Left Bank Upstream of SR 37 levee adjacent to Farmers Basin by raising the levee elevations to provide adequate flood protection and freeboard and rebuild portions of the levee to meet design standards for stability and seepage.

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; or

Less-than-Significant Impact. As discussed in Section II.F, *Project Description*, the Project would include increasing hydraulic conveyance of flood flows within the Novato Creek channel and increase the holding capacity of the basins. The improvements to the carrying capacity of Novato Creek and the holding capacity of the basins would improve the existing stormwater drainage system in the area of the Project, as well as in upstream areas of the Novato Creek basin. The Project consists of improving the function of the existing habitat and does not include the creating of additional sources of pollution. With implementation of the Project design to improve the stormwater drainage system, impacts relative to stormwater drainage systems or additional sources of polluted runoff would be less than significant.

iv) Impede or redirect flood flows?

Less-than-Significant Impact. As discussed in Section II.F, *Project Description*, the Project would include increasing hydraulic conveyance of flood flows within the Novato Creek channel and increase the holding capacity of the basins. One of the purposes of the Project is to improve the carrying capacity and flow of Novato Creek and the Bird Ponds by restoring the existing channel, ponds, levees, etc. Flood flows in Novato Creek within the Project site would not be redirected, per se. With implementation of the Project design to improve the flow of surface water in Novato Creek and through the Project site, impacts relative to flooding would be less than significant.

d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

Less-than-Significant Impact. The Project site is located within a FEMA-designated 100-year flood zone (FEMA 2021). However, as discussed in Section II.F, *Project Description*, and above in Question iv, the Project would include increasing hydraulic conveyance of flood flows within the Novato Creek channel, as well as improving flood flow retention in the Bird Ponds. The improvements to the carrying capacity of Novato Creek would reduce the potential for flooding by more efficiently carrying stormwater to the San Francisco Bay, thus reducing the potential for flooding in upland areas that are drained by Novato Creek. With implementation of the Project design to improve the flow of surface water in Novato Creek and through the Project site, impacts relative to flooding would be less than significant.

Hydraulic modeling was completed for future conditions, assuming a quasi-equilibrium accretion elevation based on long term marsh elevation monitoring data for the Sonoma Baylands tidal marsh restoration project (ESA PWA, 2014) and a 1.9-foot increase in sea-level, corresponding to the medium-high risk aversion, high emission projection for 2050 and the low risk aversion, high emission projection for 2070 as documented by the California Ocean Protection Council (OPC, 2018). The modeling showed decreases in water surface elevations due to increased flow conveyance from the expanded Novato Creek, thus providing resiliency to future conditions.

No Impact. The Project is not located within a tsunami zone (CGS 2022). Therefore, relative to tsunamis, there would be no impact.

No Impact. The Project site does not have water bodies that could experience a seiche in the event of an earthquake. Therefore, relative to seiches, there would be no impact.

e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Less-than-Significant Impact. The Project site is located within the San Francisco Bay Region, which is covered under the Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan; RWQCB 2019). The project site is not located within an area covered under a sustainable groundwater management plan. As previously discussed, the end result of the Project would be to improve the function of Novato Creek and the Deer Island levees, ecotones, and basins. This improvement would be consistent with the Basin Plan by reducing erosion and sedimentation, and result in an impact of less than significant.

11. Land Use and Planning

Would the project:	Significant or Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Physically divide an established community (including a low-income or minority community)?	☐	☐	☐	☒
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Result in substantial alteration of the character or functioning of the community, or present planned use of an area?	☐	☐	☐	☒
d) Conflict with applicable Countywide Plan designation or zoning standards?	☐	☐	☐	☒

Discussion

a) Physically divide an established community (including a low-income or minority community)?

No Impact. The Project, which is located within the incorporated limits of the City of Novato, would restore ecologically valuable tidal wetlands for special-status species by providing full tidal connectivity to the diked areas that were historically tidal wetlands along Novato Creek, as well as improve flood resiliency in the area within the City of Novato. The Project area (within which the Project site is located) is bordered by commercial and office development, the NSD RWF, the City of Novato Corporation Yard, and the SMART rail line on the west, residential areas along Olive Avenue to the north, Deer Island Open Space Preserve to the east, and Novato Creek to the south, which flows east to San Pablo Bay (Figure 2). While the Project would restore and enhance wetlands and floodflows, it would not divide any community – the creeks and marshes are existing physical divisions which have not been developed into community uses. Therefore, the Project would not divide any established communities, nor would it occur within an established community. Project construction and operation would, therefore, result in no impact related to physically dividing an established community.

b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

No Impact. The Project is located within the incorporated limits of the City of Novato and is under the planning jurisdiction of the city. The City of Novato has zoned the Project site and Deer Island Basin as Open Space/Publicly Owned Open Space Lands. The Open Space zoning district is intended to preserve natural resources and provide for flood control. This is also consistent with the

City's General Plan land use designation for the area. Additionally, the Bird Ponds and Novato Creek are mapped as Wildlife Refuge and Tidal Marsh, respectively on the in the Bay Conservation and Development Commission's (BCDC) 2012 San Francisco Bay Plan Maps (Bay Plan Maps); the remainder of the Project site is not mapped. The Project objectives for the Bird Ponds and Novato Creek would also be consistent with the Bay Plan Maps. Based on this, it would not conflict with the City's land use controls. Therefore, there would be no impact.

c) Result in substantial alteration of the character or functioning of the community, or present planned use of an area?

No Impact. As noted in Questions a and b, the Project's objectives aim to restore the existing and historic tidal wetlands along Novato Creek. There are no elements of the Project that would substantially alter the existing character or function of the community or planned land uses. There would be no impact.

d) Conflict with applicable Countywide Plan designation or zoning standards?

No Impact. The Project site is wholly situated within the incorporated area of the City of Novato. As the Marin Countywide Plan governs the unincorporated areas of the County, it would not apply to this Project. There would be no impact.

12. Mineral Resources

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

Discussion

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

No Impact. There are no mines, mineral plants, oil, gas, or geothermal wells located at the Project site (CDC, 2013; USGS, 2013). The Project would not involve mining onsite. Therefore, the Project would not alter, destroy, or limit access to any existing significant mineral resources and would have no impact to this resource.

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?

No Impact. The Project site is located in an area classified as MRZ-1, with no known significant mineral deposits present (City of Novato, 2022). In addition, there are no mines, mineral plants, oil, gas, or geothermal wells located at the project (CDC). The City of Novato's General Plan does not indicate presence of locally important mineral resources for the Project site. Therefore, the Project would not alter, destroy, or limit access to any existing significant mineral resources and would have no impact to this resource.

13. Noise

Would the project result in:	Significant or Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) 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?	☐	☐	☒	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
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?	☐	☐	☐	☒

Environmental Setting

Noise Terminology

Noise is generally defined as unwanted sound. Sound, traveling in the form of waves from a source, exerts a sound pressure level (referred to as sound level), which is measured in decibels (dB), with 0 dB corresponding roughly to the threshold of human hearing and 120 dB to 140 dB corresponding to the threshold of pain.

Sound pressure fluctuations can be measured in units of hertz (Hz), which correspond to the frequency of a particular sound. Typically, sound does not consist of a single frequency, but rather a broad band of frequencies varying in levels of magnitude (sound power). The sound pressure level, therefore, constitutes the additive force exerted by a sound corresponding to the frequency/sound power level spectrum.

The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. As a consequence, when assessing potential noise impacts, sound is measured using an electronic filter that de-emphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ear's decreased sensitivity to low and extremely high frequencies instead of the frequency mid-range. This method of frequency weighting is referred to as A-weighting and is expressed in units of A-weighted decibels (dBA). Frequency A-weighting follows an international standard methodology of frequency de-emphasis and is typically applied to community noise measurements.

When a new noise is introduced to an environment, the human reaction can be predicted by comparing the new noise to the ambient noise level, which is the existing noise level comprised of all sources of noise in a given location. In general, the more a new noise exceeds the ambient noise level, the less acceptable the new noise will be judged by

those hearing it. With regard to increases in A-weighted noise level, the following relationships occur (Caltrans 2013).

- Except in carefully controlled laboratory experiments, a change of 1-dB cannot be perceived.
- Outside of the laboratory, a 3-dB change is considered a just-perceivable difference.
- A change in level of at least 5-dB is required before any noticeable change in human response would be expected.
- A 10-dB change is subjectively heard as approximately a doubling in loudness, and can cause an adverse response.

The perceived increases in noise levels described above are applicable to both mobile and stationary noise sources. These relationships occur in part because of the logarithmic nature of sound and the decibel system. The human ear perceives sound in a non-linear fashion; hence, the decibel scale was developed. Because the decibel scale is based on logarithms, two noise sources do not combine in a simple additive fashion, rather logarithmically. For example, if two identical noise sources produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA.

Noise exposure is a measure of noise over a period of time. Noise level is a measure of noise at a given instant in time. Community noise varies continuously over a period of time with respect to the contributing sound sources of the community noise environment. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise exposure, with the individual contributors unidentifiable. The background noise level changes throughout a typical day, but does so gradually, corresponding with the addition and subtraction of distant noise sources such as traffic and atmospheric conditions. What makes community noise constantly variable throughout a day, besides the slowly changing background noise, is the addition of short duration single-event noise sources (e.g., aircraft flyovers, motor vehicles, sirens), which are readily identifiable to the individual receptor. These successive additions of sound to the community noise environment vary the community noise level from instant to instant, requiring the measurement of noise exposure over a period of time to legitimately characterize a community noise environment and evaluate cumulative noise impacts.

This time-varying characteristic of environmental noise is described using statistical noise descriptors. The most frequently used noise descriptors are summarized below:

L_{dn}: A 24-hour day and night A-weighted noise exposure level, which accounts for the greater sensitivity of most people to nighttime noise by weighting noise levels at night (“penalizing” nighttime noises). Noise between 10:00 p.m. and 7:00 a.m. is weighted (penalized) by adding 10 dB to take into account the greater annoyance of nighttime noises.

CNEL: The Community Noise Equivalent Level (CNEL); similar to L_{dn}, the CNEL adds a 5-dB “penalty” for the evening hours between 7:00 p.m. and 10:00 p.m. in addition to a 10-dB penalty between the hours of 10:00 p.m. and 7:00 a.m.

L_{eq}: The energy-equivalent sound level is used to describe noise over a specified period of time, typically one hour, in terms of a single numerical value. The L_{eq} is the constant sound level, which would contain the same acoustic energy as the varying sound level, during the same time period (i.e., the average noise exposure level for the given time period).

L_{max}: The instantaneous maximum noise level for a specified period of time.

Vibration Terminology

As described in the Federal Transit Administration's (FTA) Transit Noise and Vibration Impact Manual, ground-borne vibration can be a serious concern for nearby neighbors, causing buildings to shake and rumbling sounds to be heard (FTA 2018). In contrast to airborne noise, ground-borne vibration is not a common environmental problem. It is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Some common sources of ground-borne vibration are trains; buses and heavy trucks on rough roads; and construction activities such as blasting, sheet pile-driving, and operating heavy earth-moving equipment.

Several different methods are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal, which is measured in inches per second. The PPV is most frequently used to describe vibration impacts on buildings. The root mean square (RMS) amplitude is most frequently used to describe the effect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (VdB) is commonly used to express RMS. The decibel notation acts to compress the range of numbers required to describe vibration. Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Sensitive receptors for vibration assessment include structures (especially older masonry structures), people who spend a lot of time indoors (especially residents, students, the elderly and sick), and vibration-sensitive equipment such as hospital analytical equipment and equipment used in computer chip manufacturing.

The effects of ground-borne vibration include the movement of the building floors, rattling of windows, shaking of items on shelves or hanging on walls, and rumbling sounds. In extreme cases, the vibration can cause damage to buildings. Building damage is not a factor for most projects, with the occasional exception of blasting and pile-driving during construction, which would not occur under the Proposed Project. Annoyance from vibration often occurs when the vibration exceeds the threshold of perception by only a small margin.

Sensitive Receptors

Human response to noise varies considerably from one individual to another. Effects of noise at various levels can include interference with sleep, concentration, and communication, and can cause physiological and psychological stress and hearing loss. Given these effects, some land uses are considered more sensitive to ambient noise levels than others. In general, residences, schools, hospitals, and nursing homes are

considered to be the most sensitive to noise. Places such as churches, libraries, and cemeteries (where people tend to pray, study, and/or contemplate) are also sensitive to noise. Commercial and industrial uses are considered the least noise-sensitive.

The Project is located within the City of Novato, with existing residences on the south side of Louis Drive as close as 70 feet from proposed setback levee and ecotone construction in the West Deer Island Basin.

Existing Noise Setting

The noise environment surrounding the Project site is influenced by vehicular traffic along US 101, approximately 580 feet to the west and SR 37, approximately 200 feet to the southeast from the Project site. According to the Adopted Novato General Plan Noise Element (Living Well), the Project environs are located inside the 60 dBA L_{dn} noise contour from roadway sources (City of Novato 2020). Project site is also influenced by the SMART rail line that extends along the western edge of the Project site. Noise results for the short-term monitoring locations are summarized in **Table 9**.

TABLE 9
EXISTING NOISE ENVIRONMENTS IN THE PROJECT VICINITY

Noise Monitoring Location	Noise Levels (dBA) Daytime[a] Hourly Average L_{eq}	Primary Noise Sources
ST-1: Louis Drive meets Fernando Drive	42.1	Distant traffic on US 101 and neighborhood traffic
ST-2: Manuel Drive, entrance to Slade Park	53.0	Traffic on US 101 and the Northwestern Pacific Railroad
ST-3: Lea Court meets Lea Drive	38.0	Neighborhood traffic

NOTES:
dBA = A-weighted decibels; L_{eq} = equivalent-continuous sound level
[a] Daytime hours are considered to be 7 a.m. to 10 p.m.
SOURCE: Environmental Science Associates in 2022.

Existing noise levels in the Project site are characteristic of a residential environment, with short-term measurements having a daytime sound level (L_{eq}) of 53 dBA or less. SMART rail line forms the western edge of the Project site, approximately 230 feet from the noise measurement location ST-2. Railroad operations contribute intermittent noise to the ambient noise environment.

Discussion

a) 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?

The Project site is located within the jurisdiction of the City of Novato.

Construction Impacts

Less-than-Significant Impact. The City of Novato does not establish quantitative noise limits for demolition or construction activities occurring within its jurisdiction. The City of Novato has established allowable construction hours within its municipal code. Project construction activities are proposed to occur from approximately 7:00 a.m. to 6:00 p.m., Monday through Friday. Section 19.22.070(B) of the Novato Municipal Code restricts construction activities to between 7:00 a.m. and 6:00 p.m., Monday through Friday, and 10:00 a.m. and 5:00 p.m. on Saturdays.

In lieu of a specified criterion for assessing the magnitude of a construction noise impact in local regulations, the analysis below compares resultant noise levels to construction noise impact criteria developed by the Federal Transit Administration (FTA). While the FTA's *Transit Noise and Vibration Impact Assessment Manual* was developed for determining significant noise and vibration impacts for transit projects and is not a regulation, it is one of the few federal sources that suggest both a methodology and criteria for assessing construction noise impacts (FTA, undated). The FTA noise impact criteria used to assess construction noise impacts on residential uses is 90 dBA during daytime hours and 80 dBA during nighttime hours.

The FTA methodology for general assessment of construction noise entails a process for calculating the hourly dBA, L_{eq} for each stage of construction considering (1) the reference noise emission level at 50 feet for equipment to be used for each stage of construction, (2) the usage factor for each piece of equipment, and (3) the distance between construction centerline and receptors. This methodology entails determining the resultant noise levels for the two noisiest pieces of equipment expected to be used in each stage of construction.

The Roadway Construction Noise Model (RCNM) of the Federal Highway Administration was used to estimate noise generated by the proposed construction activities. Construction noise levels were calculated for each stage of construction based on the equipment list provided by the applicant and presented in Tables 3A and 3B. Although there would be no long-term operational noise sources following construction, the construction of the Project could result in a substantial temporary increase in ambient noise levels in the Project vicinity above levels existing without the Project.

Construction noise levels at and near the Project site would fluctuate depending on the type, number, and duration of use of various pieces of construction equipment. It is estimated that a maximum of approximately 80 trips to and from the Project construction site would occur during Project construction on any given day. It is also assumed that all excavated material would serve as fill material and there would be no off-hauling outside of the Project site. Given the low level of construction-related vehicle trips associated with hauling and commuting

workers, these trips would not be expected to raise ambient noise levels along local roadways. **Table 10** shows typical noise levels produced by various types of construction equipment that would operate during the construction of the Project.

TABLE 10
REFERENCE CONSTRUCTION EQUIPMENT NOISE LEVELS – (50 FEET FROM SOURCE)

Type of Equipment	L_{max}, dBA	Hourly L_{eq}, dBA/Percent Used[a]
Front Loader	80	76/40
Excavator	85	81/40
Dump Truck	84	80/40
Water Truck	84	80/40
Compactor	80	73/20
Flat Bed Truck	84	74/40
Dozer	85	82/40
Concrete Mixer Truck	85	79/40
Roller	85	80/20
Crane	85	77/16

NOTE:
[a] "Percent used" were obtained from the FHWA Roadway Construction Noise Model User's Guide.

SOURCE: FHWA 2006.

The operation of each piece of equipment throughout the Project site would not be constant throughout each phase or workday, as equipment would be turned off when not in use. Over a typical workday, the equipment would operate at different locations, and all of the equipment would not operate concurrently at the same location within the Project site. To quantify construction-related noise exposure that would occur at the nearest sensitive receptors, it was assumed that the two loudest pieces of construction equipment would operate at the same time at the closest location of the Project site to the nearest off-site sensitive receptors.

Table 11 presents the results of the RCNM modelling of construction stages showing the predicted noise levels at the nearest sensitive land use. The nearest sensitive receptors are residential dwellings along Louis Drive. Predicted noise values in Table 11 represent a worst-case analysis when equipment is in operation at the point of the construction site closest to the nearest receptor, as this would occur only for a short percentage of the overall construction period. As can be seen in Table 11, noise levels generated during construction activities at the closest receptor would be below the FTA daytime criteria of 90 dBA Leq for residential uses.

As shown in Table 11, noise levels from proposed construction activities at the closest residential receptors would not exceed existing noise levels. The temporary increase in ambient noise levels would cause a less-than-significant impact.

TABLE 11
ESTIMATED NOISE LEVELS AT SENSITIVE RECEPTORS DURING PROPOSED PROJECT CONSTRUCTION

Receptor	Distance to Nearest Sensitive Receptor (feet)	Two Loudest Pieces of Construction Equipment	Combined Noise Level from 50 Feet (dBA L_{eq})[a]	Attenuated Noise Level (dBA L_{eq})[b]	Exceed 90 dBA L_{eq} (yes or no)?
Season 1: Site Preparation					
Louis Drive/Slade Park residences	100	Flat Bed Truck, Mower	82.1	76.3	No
Louis Drive/ Fernando Drive residences	70	Flat Bed Truck, Mower	82.1	79.4	No
Season 1: Novato Channel					
Lea Court/Lea Drive residences	1,600	Excavator, Grader	82.4	52.3	No
561 Louis Dr/Fernando Drive	1,800	Excavator, Grader	82.4	51.3	No
Season 1: Bird Ponds					
Lea Court/Lea Drive residences	1,560	Excavator, Grader	82.4	52.5	No
Louis Drive/Fernando Drive residences	1,500	Excavator, Grader	82.4	52.9	No
Season 1: Interior Tidal Channel					
Lea Court/Lea Drive residences	1,600	Excavator, Grader	82.4	52.3	No
Louis Drive/Fernando Drive residences	1,800	Excavator, Grader	82.4	51.3	No
Season 1: Farmers-Novato Levee					
Lea Court/Lea Drive residences	4,770	Mower, Grader	84.5	45.0	No
Louis Drive/Fernando Drive residences	5,500	Mower, Grader	84.5	43.7	No
Season 2: Site Preparation					
Louis Drive/Slade Park residences	100	Mower, Grader	84.5	78.5	No
Louis Drive/Fernando Drive residences	70	Mower, Grader	84.5	81.6	No
Season 2: Novato and Lynwood Levees					
Lea Court/Lea Drive residences	1,560	Excavator, Grader	82.4	52.5	No
Louis Drive/Fernando Drive residences	1,540	Excavator, Grader	82.4	52.6	No
Season 2: Tidal Channel					
Lea Court/Lea Drive residences	1,600	Excavator, Grader	82.4	52.3	No
Louis Drive/Fernando Drive residences	1,800	Excavator, Grader	82.4	51.3	No

TABLE 11 (CONTINUED)
ESTIMATED NOISE LEVELS AT SENSITIVE RECEPTORS DURING PROPOSED PROJECT CONSTRUCTION

Receptor	Distance to Nearest Sensitive Receptor (feet)	Two Loudest Pieces of Construction Equipment	Combined Noise Level from 50 Feet (dBA L_{eq})[a]	Attenuated Noise Level (dBA L_{eq})[b]	Exceed 90 dBA L_{eq} (yes or no)?
Season 2: Water Control Structures					
Louis Drive/Slade Park residences	100	Concrete Pump Truck, Crane	76.6	70.6	No
Louis Drive/Fernando Drive residences	70	Concrete Pump Truck, Crane	76.6	73.7	No
Season 2: Boardwalk					
Lea Court/Lea Drive residences	3,450	Flatbed Truck	70.3	33.5	No
Louis Drive/Fernando Drive residences	3,680	Flatbed Truck	70.3	32.9	No

NOTES:
[a] Reference construction equipment noise levels were obtained from Caltrans' Roadway Construction Noise Level (RCNM).
[b] Assumed an attenuation rate of 7.5 dB per doubling of distance (i.e., soft site), to account for interning terrain and structures.

SOURCE: FHWA 2006.

Operation Impacts

No Impact. Once all construction activities are completed, the Project would not create any new permanent noise sources (e.g., pumps, generators). Periodic maintenance of the levee and restoration areas would be similar to existing conditions. Therefore, operation and maintenance of the Project would not generate a substantial increase in noise levels in excess of standards established in the local general plan or noise ordinance. This would result in no impact from project operations and maintenance.

b) Generation of excessive groundborne vibration or groundborne noise levels?

Less-than-Significant Impact. The construction of the Project would include compaction, which can generate significant levels of vibration. Therefore, vibration impacts from these onsite construction activities have been evaluated.

For adverse human reaction, the analysis applies the "strongly perceptible" threshold of 0.9 inch/second PPV for transient sources (Caltrans 2020). A threshold of 0.3 inch/second PPV is used to assess damage risk for all other buildings (Caltrans 2020). There are no historic structures in the vicinity of the Project site that could be adversely affected by Project construction-related vibration.

The potential use of a compactor during construction of the Project would be expected to generate the highest vibration levels during construction. According to the Caltrans *Transportation and Construction Vibration Manual*. Compaction

activities for the new levee would occur as close as 30 feet north of existing residences along Louis Drive. These single-family residences would be exposed to a vibration level of 0.160 inch/second PPV, also well below the applied human annoyance and building damage threshold. Consequently, existing sensitive receptors and structures near the Project site would not be affected by substantial ground-borne vibration during Project construction, and there would be no activities during Project operations that involve compaction, pile driving, or other vibratory equipment. Therefore, the impact with respect to the generation of excessive vibration would be considered less than significant.

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. The Project is located over 2.6 miles south of where the City of Novato operates a general aviation airport (Gnoss Field). Given this distance from the nearest operating airport and the fact that the Project would not locate new noise-sensitive land uses within 2.6 miles of a private or public airport, Project construction and operation would not expose people residing or working in the Project site to excessive noise levels. No impact would occur.

14. Population and Housing

Would the project:	Significant or Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
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)?	☐	☐	☐	☒
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Increase density that would exceed official population projections for the planning area within which the project site is located as set forth in the Countywide Plan and/or community plan?	☐	☐	☐	☒
d) Displace existing housing, especially affordable housing?	☐	☐	☐	☒
e) Result in any physical changes which can be traced through a chain of cause and effect to social or economic impacts?	☐	☐	☐	☒

Discussion

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)?

No Impact. The Project proposes to restore Novato Creek, the Bird Ponds, and the southern portion of Deer Island Basin. The Project has no components that would cause a direct or indirect increase in population growth in the Project area. Therefore, there would be no impact.

b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

No Impact. The Project is located in open space that has no residential development. The Project would occur completely within this space and would not displace people or housing. Therefore, there would be no impact.

c) Increase density that would exceed official population projections for the planning area within which the project site is located as set forth in the Countywide Plan and/or community plan?

No Impact. The Project would not increase population density because no residential construction is proposed. The Project has no components that would cause a direct or indirect increase in population growth that would, in turn, cause

an increase in population density in the Project area. Therefore, there would be no impact.

d) Displace existing housing, especially affordable housing?

No Impact. The Project is located in open space and undeveloped land that has no residential development. The Project would occur completely within this space and would not displace people or housing. The Project would be within the creek corridor and other open space or undeveloped land and would not displace housing. Therefore, there would be no impact.

e) Result in any physical changes which can be traced through a chain of cause and effect to social or economic impacts?

No Impact. The Project proposes to restore habitat in and along Novato Creek, the Bird Ponds, and the southern portion of Deer Island Basin, as well as improve flood resiliency. The Project has no components that would cause a direct or indirect increase in population in the Project area that would, in turn, create any spin-off social or economic impacts. Therefore, there would be no impact.

15. Public Services

Would the project:	Significant or Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) 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:				
i) Fire protection?	☐	☐	☐	☒
ii) Police protection?	☐	☐	☐	☒
iii) Schools?	☐	☐	☐	☒
iv) Parks?	☐	☐	☐	☒
v) Other public facilities including roads?	☐	☐	☐	☒

Discussion

a) 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:

i), ii) Fire & Police Protection?

No Impact. The Project would be limited to restoration of the Bird Ponds, Novato Creek, and Deer Island Basin South. The Project does not remove any existing barriers to growth that has not been accounted for in the City of Novato's General Plan or other regional planning and forecasting documents. As noted in Section VI.17, *Transportation*, primary vehicular access to the Project site would be from SR 37 near the Novato Creek bridge and secondary access to northern portions of the Project site would be through the city's corporation yard via Davidson Street. No temporary lane closures are anticipated during construction of the Project on adjacent roadways. The Project would not result in a significant increase in traffic that would significantly impact response times or other performative objectives of fire and police protection services. For more details regarding traffic, haul routes, and truck trips, refer to Section VI.17, *Transportation*. Additionally, operation and maintenance of the Project would not require any additional new staff and would not disrupt fire or police service ratios further from existing during

operation. The impact for fire and police response times would be less than significant.

iii), iv), v) Schools, Parks, and Other Public Facilities Including Roads?

No Impact. The Project would not result in the need for expanded services related to school, parks, or other public facilities. As stated in Section VI.14, *Population and Housing*, the Project would not directly or indirectly contribute to population growth. Construction of the Project would not involve alterations to any schools or parks that would result in a change to service ratios. Upon completion of Project construction, the restoration sites would require minimal maintenance, consisting of annual project monitoring, water, etc. As described above, no new additional staff would be required as these maintenance activities would be performed by existing District staff. Under this criterion, the Project would not result in a substantial adverse physical impact to schools, parks, other public services, and there would be no impact.

As for the Project's potential impact to area roadways, refer to Section VI.17, *Transportation*, Questions c and d.

16. Recreation

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

Discussion

The Project site is adjacent to Slade Park and the 154-acre Deer Island Open Space Preserve (City of Novato, 2020). Deer Island Open Space Preserve is accessible via Deer Island Lane to Deer Island Trail to the north away from the Project site. A trailhead and small dirt parking area are located near the midway point of Deer Island Lane. A perimeter trail circles the preserve; the Project site is visible from the southern portions of the preserve. Slade Park is an undeveloped park with only a baseball backstop. Elvia's Home Child Care is located in the northern portion of the park, away from the Project site. The park is accessed from Davison Street and Manuel Drive.

a) Would the project 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 would not disrupt access to the nearby recreational areas. As noted in Section VI.17, *Transportation*, a limited amount of construction-related traffic would access the northern portions of the Project site (14 daily trips or 15 percent of total Project trips). While Project construction activities would occur adjacent to Slade Park and near Deer Island Open Space Preserve, the activities would occur during normal work hours (i.e., Monday to Friday, 7 AM to 6 PM). This would not preclude use of either recreational resource. The Project also does not include a residential component that could contribute to a direct increase in the use of existing recreational facilities in the use of existing recreational facilities in the area or require the expansion or construction of new facilities. As a result, the Project would not cause a shift of use and increase the use of existing neighborhood and regional parks such that a substantial physical deterioration of the facility could occur and, therefore, would not be accelerated. There would be no impact under this criterion.

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

No Impact. The Project would not include the construction or expansion of recreational facilities. However, the Project does include a restoration component that would increase the natural vegetation of the Project area and enhance the recreational experience for existing recreational facilities adjacent to or near the Project site. The Project would not involve a permanent adverse physical effect to the environment that would require the construction or expansion of additional recreational facilities. Under this criterion, there would be no impact.

17. Transportation

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

Discussion

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

Local and Regional Roadways

Less-than-Significant Impact. Construction of the Project would temporarily increase local traffic due to the transport and delivery of construction equipment and materials, as well as from daily worker trips. Regional access to the Project site would occur from US 101 and SR 37, with local access primarily occurring via the existing, gated access point along SR 37. Secondary access to the West Deer Island Basin area of the Project site would be provided through the City of Novato Corporate Yard off of Davidson Road. Existing average daily traffic (ADT) on the primary regional and local roadways that would provide access to the Project site is provided in **Table 12**.[12]

TABLE 12
EXISTING ADT ON STUDY AREA ROADWAYS

Roadway Segment	ADT
US 101 south of SR 37	134,000
US 101 north of SR 37	111,000
SR 37 east of US 101	33,000
SOURCES: Caltrans 2020.	

As described in Section II.F, *Description of Project*, Project construction of the Bird Ponds is anticipated to occur from May 2024 to September 2025, with certain seasonal work limitations to minimize impacts to special status species and the potential for flooding within the Project site due to rainy season storms.

[12] ADT is not available for Davidson Road.

Construction of Deer Island Basin South is assumed to occur in 2026 and 2027. Construction would generally occur only between the hours of 7:00 a.m. and 6:00 p.m., Monday through Friday. No work on weekends (Saturday/ Sunday) and holidays (e.g., Thanksgiving, Christmas) is anticipated. Construction activities would generate offsite traffic associated with the delivery of construction vehicles and equipment to the Project site, the daily arrival and departure of construction workers, and the delivery of materials throughout the construction period. Construction staging would occur entirely within the Project site and would not require any temporary lane closures on adjacent roadways (i.e., SR 37).

Construction worker and truck trip assumptions were developed as part of the Air Quality analysis conducted for the Project (see Section VI.3, Air Quality). The Project would require a maximum of 53 workers at the Project site, which includes equipment operators, a construction foreman, truck drivers, and laborers, and accounts for overlapping construction activities. This maximum traffic condition would occur during Season 1 during the site preparation and grading/excavation phases, and would last for approximately four months (June to October, 2024). Assuming that half of the construction workers would carpool, a maximum of approximately 80 construction worker vehicle trips per day (40 inbound, 40 outbound) would be generated by the Project. In addition, there would be approximately two truck deliveries (four one-way vehicle trips) at the Project site per day, mostly attributable to material import for Deer Island South.

Trucks used to transport materials within the Project site at Deer Island Basin South and the Bird Ponds (e.g., moving excavated material to areas where fill is needed) would occur on internal levee alignments; those vehicle trips are not included in the transportation analysis because they would not generate traffic on the public roadways that would be used to access the Project site (i.e., US 101, SR 37, Davidson Road).[13]

Based on the existing ADT volumes on study area roadways shown in Table 12 and the estimated number of construction-related project trips described above (84 one-way trips), construction activities would increase the ADT volume on study area roadways by less than 1 percent (i.e., too small of a change to be perceived by the average motorist). These increases in daily traffic would be within the typical daily fluctuations experienced on roadways (plus or minus 5 percent) and, therefore, do not represent a substantial increase in traffic. Traffic increases on Davidson Road, with a much lower baseline traffic volume than a regional highway/freeway, may be more noticeable. However, construction access occurring through the City of Novato Corporate Yard off of Davidson Street is only estimated to require up to 14 one-way daily trips (15 percent of the total construction vehicle trips described above). Considering the relatively small number of construction trips and the spreading of those trips over the course of

[13] It is assumed that all excavated material would serve as fill material and there would be no off-hauling outside of the Project site.

the workday, the roadway would continue to accommodate traffic within the roadway's carrying capacity with no discernable effect on operating conditions.

Once the Project is in operation, it is anticipated that no new staff would be employed specifically to operate or perform routine maintenance on the restored facilities. Maintenance is dependent on seasonal needs, but for the purposes of the transportation analysis it is anticipated maintenance would occur up to two days per month and would mostly involve inspection for erosion or rodent damage along the levee tops and slopes, fire fuel reduction, mowing and weed control and repair of erosion sites. Such activities would generate very few (i.e., less than five) worker and truck trips per month. Major repair activities would be episodic and occur only as- needed and cannot be reliably anticipated or scheduled. Therefore, additional truck trips resulting from maintenance of the Project would be minimal.

Based on the above discussion, construction and operation of the Project would result in less-than-significant impacts on roadways.

Congestion Management Plan Facilities

Less-than-Significant Impact. Congestion management programs and level of service (LOS) standards established by congestion management agencies are intended to monitor and address long-term traffic conditions related to future development that generate permanent (ongoing) traffic increases, and do not apply to temporary impacts associated with construction projects. Updated every two years, Marin County's Congestion Management Program (CMP) monitors the local multi-modal transportation networks level of service on roadways, bicycle and pedestrian facilities and transit services, and identifies improvements to the performance of these multi-modal system (Transportation Authority of Marin, 2021).

As described above, following construction, traffic increases associated with Project operation and maintenance would be minimal and would only occur up to two days per month. The Project would be operated and maintained by existing staff and would not require additional workers. Thus, there would not be a substantial increase in vehicle trips resulting from the Project. The impact on CMP facilities would be less than significant.

Public Transit, Bicycle, and Pedestrian Facilities

Less-than-Significant Impact. Due to the non-urban nature of the Project site, there are no accessible transit stops located nearby. The nearest bus stop is located on the west side of SMART train tracks at the Vintage Oaks Shopping Center (Rowland Boulevard), which is served by Marin Transit Route 251; while just to the west of the Project site, this location is not accessible due to the barrier to pedestrians posed by the SMART train tracks. There are no designated bicycle facilities or sidewalks adjacent to the Project site.

The Project would neither directly nor indirectly eliminate existing or planned alternative transportation corridors or facilities (e.g., bike paths, lanes, etc.), including changes in policies or programs that support alternative transportation, nor construct facilities in locations for which future alternative transportation facilities may be planned. The Project would not conflict with the policies set forth in the City of Novato General Plan (City of Novato, 2020) or the City of Novato Bicycle/Pedestrian Plan (City of Novato, 2015) supporting alternative transportation. As described above, construction activities associated with the Project would not generate traffic volume increases that would significantly affect traffic flow on area roadways. The performance of public transit, bicycle and pedestrian facilities in the area likewise would not be adversely affected. This impact would be less than significant.

b) Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?

Less-than-Significant Impact. In accordance with Senate Bill (SB) 743, CEQA Guidelines Section 15064.3(b) was adopted in December 2018 by the California Natural Resources Agency. These revisions to the CEQA Guidelines criteria for determining the significance of transportation impacts are primarily focused on projects within transit priority areas and shifts the focus from driver delay to a reduction of greenhouse gas emissions, creation of multimodal networks, and promotion of a mix of land uses. Vehicle miles traveled, or VMT, is a measure of the total number of miles driven to or from a development and is sometimes expressed as an average per trip or per person.

Neither the District nor the City of Novato have adopted their own VMT screening criteria and thresholds and, therefore, the statewide guidance as documented in the *Technical Advisory on Evaluating Transportation Impacts* in CEQA (Technical Guidelines) would apply to the Project (State of California, Governor's Office of Planning and Research, 2018). According to the Technical Guidelines, absent substantial evidence indicating that a project would generate a potentially significant level of VMT or inconsistency with a Sustainable Communities Strategy or general plan, projects that generate fewer than 110 trips per day generally may be assumed to cause a less-than-significant transportation impact.

Taking the information discussed above into account, the Project would not conflict with or be inconsistent with CEQA Guidelines Section 15064.3(b) during construction. Construction-generated trips would be temporary and would result in fewer than 110 trips per day during the peak construction traffic period, when there would be as many as 80 daily construction worker trips and four daily truck trips. Furthermore, no changes to existing operation and maintenance activities are anticipated. For these reasons, VMT generated by the Project would be less than significant.

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 introduce any new intersections or adjusted roadway geometry that would have the potential to introduce a hazardous driving condition. Additionally, as noted in Question a) above, the Project would not introduce a substantial number of large construction or delivery vehicles to area roadways during the construction phase. As noted previously, primary access to the Project site would occur via an existing gated driveway off of SR 37, with approximately 250 feet of shoulder leading up to it that could safely accommodate any potential queuing of Project vehicles at the driveway entrance. However, based on the anticipated number of construction vehicles traveling to/from the Project site on a daily basis, it is not expected that any substantial queuing would occur at the driveway entrance. As this is an existing driveway that is currently used by the District, the introduction of Project construction traffic (which would represent less than 1 percent of the ADT on SR 37) using this driveway would not introduce an incompatible use or otherwise result in unexpected conditions for motorists. Secondary access to the Project site through the City of Novato Corporate Yard would occur entirely on that property and would not affect traffic conditions on a public roadway. Therefore, the Project's impact with respect to increased hazards or incompatible uses would be less than significant.

d) Result in inadequate emergency access?

Less-than-Significant Impact. The Project would not change the configuration of the Project area's road network, and would not require temporary lane closures which would create reduced traffic capacity issues. As described in Question a) above, construction would cause a less-than-significant increase in congestion on area roadways, though slow-moving construction-related vehicles could temporarily interfere with emergency response to the Project site (e.g., emergency service vehicles traveling behind the slow-moving truck). However, all vehicles are required by law to yield to responding emergency vehicles that have warning apparatus in operation, and it is not considered likely that heavy construction-related traffic would result in inadequate emergency access. Adherence to existing traffic rules-of-the-road would ensure that the Project's construction impacts to emergency access would be less than significant.

18. Tribal Cultural Resources

Would the project:	Significant or Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k)?	☐	☒	☐	☐
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☒	☐	☐

Discussion

A tribal cultural resource is defined in PRC Section 21074 as either a site, feature, place, or cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is listed or eligible for the California Register or a resource determined significant by the lead agency. PRC Sections 21080.3.1, 21080.3.2, and 21082.3 require lead agencies to engage in tribal consultation with California Native American Tribes, and PRC Sections 20174 and 21083.09 require lead agencies to analyze project impacts on tribal cultural resources separately from archaeological resources.

Native American Correspondence

On behalf of the District, ESA contacted the NAHC in December 2020, to request a search of the NAHC's SLF and a list of representatives from California Native American Tribes who may have knowledge of tribal cultural resources in the vicinity of the Project site or interest in the Project. The NAHC replied to ESA in January 2021, with the statement that the SLF has record of a sacred site at the Project site and to contact the FIGR regarding the resource. The NAHC's response also included a list of representatives from California Native American Tribes to contact regarding these resources and who may be interested in the Project.

In support of required Native American consultation for the Project pursuant to PRC Section 21080.3, the District sent letters in March 2021 to the representatives from the

following California Native American Tribes: FIGR and Ione Band of Miwok Indians. These letters provided information on the Project and requested that the recipients notify the District if they would like to consult pursuant to PRC Section 21080.3. The District also sent a letter, in September 2021, to the CMTCM with information on the Project and requesting that the CMTCM notify the District if they are concerned about any potential Project impacts on tribal cultural resources. The only responses from these letters were from the FIGR, stating that the FIGR formally requests consultation on the Project pursuant to PRC Section 21080.3, and from the CMTCM, stating that the CMTCM would like to consult with the District on the Project.

The District has conducted individual conference calls with both the FIGR and the CMTCM regarding the Project; these calls included presentations and information on the Project, a review of cultural resources studies conducted for the Project to date, and open discussions regarding Tribal concerns on potential Project impacts on cultural resources and tribal cultural resources. The District also sent the CHRIS results for the Project to the FIGR for review. Additionally, the District and the CMTCM conducted a site visit to review the Project and overall Project site. Consultation between the District and the FIGR is ongoing, as are communications between the District and the CMTCM. To date, none of the Native American representatives contacted has specifically stated that a known tribal cultural resource may be impacted by the Project.

Records Search

The results of a cultural resources records search at the NWIC of the CHRIS were received in December 2020. The review included all areas within 0.5 mile of the Project site. The NWIC records search identified one previously recorded cultural resource, indigenous archaeological site P-21-000199, within the Project site.

Field Survey

ESA completed pedestrian surveys of the Project site on May 26 and August 26, 2022. During the pedestrian survey, ESA identified archaeological material consistent with what was previously recorded at indigenous archaeological site P-21-000199. No additional indigenous archaeological resources were identified during the survey.

Summary of Resources Identified

Through background research, consultation with California Native American Tribes, and a field survey, one indigenous archaeological resource, P-21-000199, was identified in the Project site. This resource was recommended not eligible for the California Register and also as not qualifying as a unique archaeological resource, pursuant to CEQA (Hoffman and Cleveland, 2022). To date, neither of the California Native American Tribes with which the District has consulted on the Project has specifically stated that a known tribal cultural resource may be impacted by the Project. This analysis is supported by the confidential Project-specific cultural resources technical report (Hoffman and Cleveland, 2022) included by reference to this document. State law

prohibits the public dissemination of locational and other information on known cultural resources.

a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k)?

Less-than-Significant Impact with Mitigation Incorporated. Based on the current status of consultation with California Native American Tribes on the Project, as well as archival research and the field survey, no tribal cultural resources have been identified in the Project site. Therefore, the Project is not anticipated to impact any tribal cultural resources, as defined by PRC Section 21074. However, if any previously unrecorded archaeological resource were identified during Project ground-disturbing construction activities and were found to qualify as a tribal cultural resource, pursuant to PRC Section 21074, any impacts on the resource resulting from the Project could be potentially significant. The potentially significant impact would be reduced to a less-than-significant level with implementation of Mitigation Measures CUL-1, CUL-2, and TRI-1, as well as compliance with PRC Section 5097.98, California Health and Safety Code Section 7050.5, and the City of Novato Municipal Code Section 4-7.5, that identify steps to follow in the event of the accidental discovery or recognition of any human remains in any location other than a dedicated cemetery, as well as establish reporting requirements associated with treatment of Native American skeletal remains, and establish penalties for noncompliance with these requirements.

Mitigation Measure CUL-1: Cultural Resources Awareness Training

See Section VI.5, *Cultural Resources*, for the full text of Mitigation Measure CUL-1.

Mitigation Measure CUL-2: Cultural Resources Construction Monitoring

See Section VI.5, *Cultural Resources*, for the full text of Mitigation Measure CUL-2.

Mitigation Measure TRI-1: Inadvertent Discovery Protocol for Native American Resources

If Native American archaeological resources are encountered during Project construction, all construction activities within 100 feet shall halt, and a qualified archaeologist, defined as an archaeologist meeting the

SOI PQS for Archeology, shall inspect the find within 24 hours of discovery and notify the District of their initial assessment. Native American archaeological materials might include: obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil (midden) containing heat-affected rocks, artifacts, or shellfish remains; stone milling equipment (e.g., mortars, pestles, handstones); and battered stone tools, such as hammerstones and pitted stones.

If the District determines, based on recommendations from the qualified archaeologist and California Native American Tribes that are traditionally and culturally affiliated with the Project site, that the resource may qualify as a tribal cultural resource (as defined in PRC Section 21074), the resource shall be avoided, if feasible. Consistent with CEQA Guidelines Section 15126.4(b)(3), this may be accomplished through: planning construction to avoid the resource; incorporating the resource within open space; capping and covering the resource; or deeding the site into a permanent conservation easement. If avoidance of the resource is not feasible, the District shall continue to consult with California Native American Tribes that are traditionally and culturally affiliated with the Project site to determine treatment measures to avoid, minimize, or mitigate any potential impacts to the resource pursuant to PRC Section 21083.2, and CEQA Guidelines Section 15126.4. This shall include documentation of the resource and may include data recovery (according to PRC Section 21083.2), if deemed appropriate, or other actions such as treating the resource with culturally appropriate dignity and protecting the cultural character and integrity of the resource (according to PRC Section 21084.3). Any technical report developed to document the implementation mitigation shall be submitted to the NWIC upon District approval, unless the document contains information that California Native American Tribes involved in the development of the mitigation deem should not be filed with the NWIC, in which case, the report shall be submitted to the NAHC.

ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

Less-than-Significant Impact with Mitigation Incorporated. Refer to the response to Question a.i above.

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19. Utilities and Service Systems

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

Discussion

a) Require or result in the relocation or construction of new or expanded water, wastewater or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

Less-than-Significant Impact. The Project consists of improving the function of the existing habitat and does not include the creating of additional sources of water, wastewater, electrical power, natural gas, or telecommunications facilities. As discussed in the Project Description, the Project site is traversed by Pacific Gas & Electric (PG&E) transmission and distribution lines. A 48-inch recycled water force main bisects the larger Deer Island Basin and forms the northern limit of Deer Island Basin South.

While construction work would not require the relocation of any power lines, construction would have the potential to damage power lines and expose construction workers to hazardous conditions, particularly when working near the distribution lines on the levees. To avoid this potential damage, construction

workers would follow the Power Line Safety standards from the Department of Industrial Relations.[14] This includes:

- Identifying the work zone;
- Determine if any part of the equipment, load line or load (including rigging and lifting accessories), if operated up to the equipment's maximum working radius in the work zone, could get closer than 20 feet to a power line;
- Preventing encroachment/electrocution; and
- Providing training to operators and crew members

The Project would include increasing hydraulic conveyance of flood flows within the Novato Creek channel and increase the holding capacity of the basins. The improvements to the carrying capacity of Novato Creek and the holding capacity of the basins would improve the existing stormwater drainage system.

After the conclusion of construction, there would be no need for utility services beyond those already present on the Project site for maintenance activities and pump operation. Therefore, the impact with regard to the relocation or construction of new or expanded utilities would be less than significant.

b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?

Less-than-Significant Impact. Project construction would require water for dust control. This analysis assumes that water for dust control would be provided by the construction contractor(s), but could be provided by water from dewatering provided it meets water quality permit conditions and aligns with the construction timeline. Otherwise, the construction contractor would buy water from available water sources near the project site and/or store water on the project site, as needed for dust suppression.

As part Project, restoration plants would be installed and invasive plants would be removed. Management would be required to remove invasive weeds and planting of new plants. Irrigation water would be required for the new plants in upland and transition zones. The water used would be by temporary drip irrigation, used only as needed until plants have matured. Water supplies to serve the irrigation would be purchased from local sources of water and stored onsite in tanks to be pumped through the irrigation system. Water supplies could come from recycled water purchased directly from the Novato Sanitary District (NSD) to serve the Project during the irrigation seasons.

[14] Subchapter 4. Construction Safety Orders, Article 15. Cranes and Derricks in Construction. § 1612.1. Power Line Safety (Up to 350 kV) - Equipment Operations. Available: https://www.dir.ca.gov/title8/1612_1.html.

No irrigation water would be needed for plantings after establishment during the habitat restoration activities. In addition, water use would be limited to efficient drip irrigation of any areas requiring additional plantings through the operation and maintenance adaptive management plan from sources mentioned above. For these reasons, the project would have sufficient water supplies available to serve the project and the impact would be less than significant.

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?

Less-than-Significant Impact. Construction, operation, and maintenance of the Project would not require permanent wastewater treatment. Portable toilets would be provided onsite for construction workers over the four construction seasons. This analysis assumes the construction contractor would be responsible for sanitary waste disposal, which could be provided by NSD. It is assumed that there would be no more the 61 construction workers on the Project site at any given time, this would be a negligible increase in sanitary waste in the NSD treatment system. There would be no need for wastewater treatment as a result of maintenance activities after the completion of constructive. Therefore, the Project would have a less-than-significant impact to wastewater treatment systems and providers.

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?

No Impact. To the extent possible, dredged and graded materials (i.e., rocks, soil, bed material) currently onsite would be reused onsite to develop the Project features. This analysis assumes that no excess or contaminated material would need to be disposed of off the Project site. Although not anticipated, any excess materials would be recycled or disposed of in compliance with all federal, state, and local regulations. No waste would be created or disposed of during maintenance of the Project. Therefore, there would be no impact under these criteria.

e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

No Impact. See to response to Question d above.

20. Wildfire

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:	Significant or Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) 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?	☐	☐	☒	☐
b) 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?	☐	☐	☒	☐
c) 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?	☐	☐	☒	☐
d) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☒	☐

Discussion

a) 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 could increase the risk of wildfire by introducing new sources of ignition (i.e., construction, vehicles) into the area. However, as a condition of approval, and pursuant to the Marin County Fire Code the Project would be required to comply with requirements relating to emergency planning and preparedness, fire service features, building services and systems, fire, and smoke protection features, building materials, construction requirements, and specific requirements for specialized uses involving flammable and hazardous materials.

Chapter 16.17 of the code contains specific requirements for land uses in the Urban-Wildland Interface (UWI). UWI areas are mapped adjacent to the north of Deer Island Basin South. Requirements within the code include regulations overseeing special building construction requirements within UWI areas, requirements for water supplies and fire protection, and requirements for vegetation management. The code also specifies the requirements for fire protection plans, which are plans that address site-specific wildfire risks that include considerations of location, topography, slope aspect, flammable vegetation, climatic conditions, and fire history. Fire protection plans are required to address issues such as water supply, access, building ignition and fire-resistance factors, fire protection systems and equipment, defensible space, and

vegetation management. Pursuant to the County Code, preparation and approval of a fire protection plan that addresses the specific manner in which the Project would implement the requirements of the code would be required for the Project.

Also, as discussed above, Novato General Plan policies have been adopted to minimize impacts from wildfire. Specifically, Policy SH 3c requires new development within Wildland-Urban Interface (WUI) areas to develop and implement a Vegetation Management Plan in accordance with City and Fire District regulations and requirements. Policy SH 3d requires management of public lands as appropriate and feasible to minimize chances of wildfire affecting residences and business while maintaining habitat functions and values. Policy SH 3f requires active implementation of the applicable elements of the Novato Fire Protection District All Hazards Mitigation Program.

Based upon these considerations, their implementation would reduce impacts associated with accidental ignitions emanating from the Project site and would also reduce impacts associated with wildfires encroaching onto the Project site from adjacent areas. The impact would therefore be less than significant.

b) 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 site is a relatively flat, nearly treeless floodplain; the only site relief is from the levees that rise above the floodplain and have slopes on either side. The area can experience strong winds traveling through San Pablo Bay. These conditions contribute to the potential for high fire danger on the site. However, the lack of trees and mostly grasslands and marsh make the fuel load of the site low, reducing the severity of wildfire risks. Construction activities would include dust suppression using water trucks and all equipment would be required to be equipped with spark arresting devices and fire equipment (e.g., fire extinguishers). Construction workers could be exposed to an uncontrolled spread of wildfire, but their brief presence on the site combined with the low severity of a grass or marshland wildfire makes the impact from wildfire risk low.

The expansion of tidal pond and marsh habitat, which has lower fire risk than either the existing seasonal wetlands or grasslands, could potentially lower fuel load and, thus, wildfire risk of the Project overall. No fuels would be used or stored on-site for project operation; therefore, the impact of the Project would be less than significant.

c) 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. The Project site contains no steep slopes that would expose people or structures to significant risks, because of runoff, post-fire slope instability, or drainage changes. Post-fire impacts such as slope instability and downstream flooding are more typically associated with steep wildland areas that burn and then erode or slide onto downslope areas. These conditions do not exist within the Project site. Further, the Project site's low potential for wildfire negates the potential for substantial post-fire effects to occur to increased risk. Based on these considerations, the effect of the Project's implementation would be less than significant.

d) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

Less-than-Significant Impact. The Project would not include any permanent habitable structures. The expansion of tidal pond and marsh habitat, which has lower fire risk than either the existing seasonal wetlands or grasslands, could potentially lower fuel load and, thus, wildfire risk of the Project overall. Therefore, the concern for the Project's potential to increase wildfire risk that could result in loss, injury, or death would be during the Project's construction phase.

As discussed in Questions a and b, the Project would be required to implement several standard requirements aimed at reducing risks from wildfire. The Project would also be required to conform to specific requirements for land uses in the UWI, including vegetation management. Finally, during construction, the Project would also be required to prepare and implement a fire protection plan, which are plans that address site-specific wildfire risks that include considerations of location, topography, slope aspect, flammable vegetation, climatic conditions, and fire history. Fire protection plans are required to address issues such as water supply, access, building ignition and fire-resistance factors, fire protection systems and equipment, defensible space, and vegetation management. Per the requirements of the County Code, preparation and approval of a fire protection plan would be required for the Project and would address the specific manner in which the Project would implement the requirements of the code.

Based upon these considerations, their implementation would reduce the risks associated with wildfires. As conditions of approval for the Project, their implementation would reduce impacts associated with exposure of people and structures to wildfires. The impact would therefore be less than significant.

21. Mandatory Findings of Significance

Pursuant to Section 15065 of the State EIR Guidelines, a project shall be found to have a significant effect on the environment if any of the following are true:

		Yes	No	Maybe
a)	Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐
b)	Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☒	☐
c)	Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐
d)	Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals?	☐	☒	☐

Discussion

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

As discussed in Section VI.4, *Biological Resources*, implementation of Mitigation Measures BIO-1 through BIO-10 would ensure that development of the Project would not: (1) substantially reduce the habitat of a fish or wildlife species; (2) cause a fish or wildlife species population to drop below self-sustaining levels; (3) threaten to eliminate a plant or animal community; or 4) reduce the number or restrict the range of a rare or endangered plant or animal. Specifically, implementation of Mitigation Measures BIO-1 through BIO-10 would ensure that potentially significant impacts would be reduced to less-than-significant levels. As discussed in Section VI.5, Cultural Resources. implementation of Mitigation Measures CUL-1 and CUL-2 would ensure that the Project does not eliminate important examples of the major periods of California history or prehistory. Implementation of Mitigation Measures CUL-1, CUL-2, and TRI-1 would ensure that potentially significant impacts to tribal cultural resources would be reduced to less-than-significant levels. In addition, mitigation measures would be implemented as described in Section VI.3, *Air Quality*, and Section VI.8, *Greenhouse Gas Emissions*, sections to reduce other impacts to less-than-significant levels. Therefore, Project impacts would be less than significant with mitigation incorporated.

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)?

A cumulative impact refers to the combined effect of "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (CEQA Guidelines Section 15355). As defined by the State of California, cumulative impacts reflect "the change in the environment which results from the incremental impact of the Proposed Project when added to other closely related past, present, and reasonably foreseeable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time" (CEQA Guidelines Section 15355(b)).

Consideration of past, present, and reasonably foreseeable projects in the Project site and vicinity indicate that the Deer Island Basin Complex Tidal Wetland Restoration Project would have a less than significant cumulative impact. Planned projects or areas anticipated for future build-out within the vicinity, or projects that are of a similar nature along Novato Creek, include the following:

- ***Ultimate Western Section, Route 37 from US 101 to SR 121, Caltrans, District 4.*** This project includes a four-lane highway at sea level rise (SLR) Design Elevation, a bike path, Lakeville Highway intersection and Atherton Interchange improvements at design elevation, and other freeway ramp/connector improvements to provide SLR resilience. The project is currently in the planning stage, with construction estimated for completion by 2030.
- ***SR 37 Interim Western Section Flood Reduction Project, In and near Novato, from Route 101 to Sonoma County line; also in Sonoma County on Route 37, from Marin County line to Route 121 (PM 0.0/3.9).*** Reconstruct the roadway to address SLR and recurrent flooding. Construction may occur intermittently until 2025–2026.
- ***Ecological & Restoration Enhancement, various locations along Route 37.*** Provide corridor-wide ecological and restoration enhancements at SR 37 stream crossing points. Construction is estimated to occur intermittently through 2025-2026.
- ***Shoreline Improvements Levee Protection, various locations along Route 37, Caltrans, District 4.*** Near-term shoreline improvements/ levee protection. Construction may occur intermittently until 2025-2026.
- ***Novato Creek Bypass Study Project, Marin County Flood Control District.*** Identify opportunities along Novato and lower Warner creeks and through the bypass drainage system for new flow gates, perimeter barriers, pump stations, and increased stormwater detention that would reduce flood

risk in downtown Novato and Nave Gardens. This includes alternatives to existing systems (i.e., move pump station from Lynwood Basin to Scottsdale Pond). This analysis is key because of the potential costs for repairing the Lynwood Pump Station in its current location (estimated at $3.0 million). The study is anticipated to be completed in 2023.

- ***Grant Avenue Bridge Rehabilitation, City of Novato.*** This project would widen and rehabilitate the existing bridge to accommodate bike lanes and sidewalks, replace substandard bridge railings, and stabilize the banks and channel of Novato Creek to minimize scouring of bridge foundation. This project remains in the design/planning stage as of the date of this report, with no estimated time of construction.
- ***Novato Creek Sediment Removal Project, Marin County Flood Control District:*** This project includes removing sediment from portions of Novato Creek, Arroyo Avichi, and Warner Creek to maintain the design flow capacity of the Novato Creek Flood Control Project. The sediment from this project has been placed within Deer Island Basin, along West Basin Cross Levee, within Heron's Beak Pond, and for raising Lynwood Levee. The next sediment removal event is scheduled for 2024 or 2025.

The proposed haul routes for the Project extend primarily from SR 37. As noted in the analysis, Project-related traffic would be limited to equipment/materials delivery and worker commutes. There would be limited Project access from the north through the City of Novato corporation yard on Davidson Street, which also provides access to residential neighborhoods and the NSD WRF. The SR 37 projects listed above are scheduled to occur at various times from present to 2030, although they are currently in the planning and design stages with no firm construction schedules. While the Lynwood Pump Station Replacement contemplated as part of the Novato Creek Bypass project would occur within this Project site and potentially use the same access points from SR 37, there are currently no details as to when this would occur. Therefore, their affect relative to this restoration project is unknown at this time. Based on the existing ADT volumes on study area roadways shown in Table 12 and the estimated number of construction-related project trips (80 one-way trips), construction activities would increase the ADT volume on study area roadways by less than 1.0 percent – too small of a change to be perceived by the average motorist. It is assumed the cumulative projects would be required to implement traffic plans if they require use of overweight or oversized vehicles. Based on the small percent increase in traffic generated by Project construction, the Project's impact to traffic in this area would not be cumulatively considerable.

The Novato Creek Bypass Study Project is active, but currently only funded through the study phase. There is currently no plan for construction. The Grant Avenue Bridge project is upstream in the same watershed on the same stream (i.e., Novato Creek). Like this restoration project, these projects would be constructed consistent with seasonal resource permit conditions when there is little or no flow in Novato Creek. The period of active construction for Grant

Avenue would be approximately nine months. However, it is not clear when this bridge replacement project would occur. The construction schedule for the Novato Creek Bypass is not known at this time. As these projects would be constructed when there would be little or no flow in Novato Creek and would potentially have minimal likelihood of overlapping construction periods, if at all, the effects of these three projects to Novato Creek would not be cumulatively considerable.

The Project would not have impacts to agriculture or forestry resources, land use and planning, mineral resources, population and housing, public services, or recreation that would combine with other projects. The proposed activities could have impacts with respect to aesthetics, biological and cultural resources, energy, geology, soils, seismicity, paleontological resources, hazards and hazardous materials, hydrology and water quality, noise, transportation and traffic, tribal cultural resources, utilities and service systems, and wildfire. However, such impacts would be limited to the Project site and, where necessary, mitigated such that they would not substantially combine with other off-site impacts.

However, the Project's potential construction impacts with respect to air quality and GHG emissions could extend beyond the site to combine with impacts from other projects. As described in above in Air Quality and Greenhouse Gas Emissions, BAAQMD considered the emission levels at which a project's individual emissions would be cumulatively considerable in developing its CEQA significance thresholds. BAAQMD considers projects that result in emissions that exceed its CEQA significance thresholds to result in individual impacts that are cumulatively considerable and significant. As discussed in these sections, the Project's emissions would be limited to the construction period and would be below BAAQMD's cumulatively considerable threshold. This impact would be less than significant.

Mitigation Measures

The following mitigation measures will be implemented to ensure that the Project would not have a cumulative effect on the environment when considered together with other projects. The full text of these measures is found in the respective resource analysis in this Initial Study.

Mitigation Measure AQ-1: Implement BAAQMD Basic Construction Mitigation Measures

Mitigation Measure BIO-1: Rare Plant Surveys

Mitigation Measure BIO-2: Best Management Practices for Biological Resources

Mitigation Measure BIO-3: Salt Marsh Harvest Mouse Protection

Mitigation Measure BIO-4: California Ridgway's Rail and California Black Rail Protection

Mitigation Measure BIO-5: Nesting Bird Protection

Mitigation Measure BIO-6: Western Pond Turtle Relocation Plan.

Mitigation Measure BIO-7: In-water Work Window

Mitigation Measure BIO-8: Fish Protection during Construction

Mitigation Measure BIO-9: Bat Protection for Western Red Bat and Pallid Bat

Mitigation Measure BIO-10: Tree Replacement Requirements

Mitigation Measure CUL-1: Cultural Resources Awareness Training

Mitigation Measure CUL-2: Cultural Resources Construction Monitoring

Mitigation Measure TRI-1: Inadvertent Discovery Protocol for Native American Resources

c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Most of the potential impacts of the Project would be temporary, short-term, and site-specific. These impacts would be localized to the Project site and may include limited adverse effects on air quality, biological resources, cultural resources/tribal cultural resources, greenhouse gas emissions, and noise. However, the Project would not include any activities or uses that would cause substantial adverse effects on human beings, either directly or indirectly. The Project has been designed to meet the District's flood standards and would adhere to local codes and regulations as conditions of Project approval. Compliance with applicable local, State, and federal standards, as well as incorporation of Project mitigation measures, would result in less-than-significant impacts. The Project would not cause substantial adverse direct or indirect effects on human beings as impacts would be avoided and minimized where possible and mitigated when necessary. Mitigation measures would be implemented as described in the Air Quality, Biological Resources, Cultural Resources, Greenhouse Gas Emissions, and Tribal Cultural Resources sections. Therefore, Project impacts would be less than significant with mitigation incorporated.

d) Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals?

The purpose of the Project is to restore ecologically valuable tidal wetlands for improved endangered species habitat and tidal connectivity to the diked areas

that were historically tidal wetlands along Novato Creek. This would achieve both the short- and long-term objectives of:

- Enhancing ecological function of the existing and historic Novato Creek
- Preserve and improve habitat conditions supporting native species
- Contribute to long term flood control goals for the lower Novato Creek Baylands
- Protect critical infrastructure located within and adjacent to the Project site by maintaining current levels of flood protection

While construction of this Project would create short-term impacts to certain resources, as discussed above, the Project would serve to provide long-term improved flood protection, habitat restoration and enhancement, and resiliency to anticipated sea level rise. Therefore, the Project would not provide a disadvantage to achieving long-term goals.

SECTION VII
Determination

(Completed by Marin County Environmental Planning Manager). Pursuant to Sections 15081 and 15070 of the State CEQA Guidelines, the forgoing Initial Study evaluation, and the entire administrative record for the project:

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

[X] I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because the mitigation measures described on an attached sheet have been added to the project. A MITIGATED NEGATIVE DECLARATION will be prepared.

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

Rachel Reid

Rachel Reid, Environmental Planning Manager

3/27/2023

Date

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Documents Incorporated by Reference

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DOCUMENTS INCORPORATED BY REFERENCE

The following is a list of relevant information sources that have been incorporated by reference into the foregoing Initial Study pursuant to Section 15150 of the State CEQA Guidelines. These documents are both a matter of public record and available for public inspection either online or at the Planning Division office of the Marin County Community Development Agency (CDA), Suite 308, 3501 Civic Center Drive, San Rafael. The information incorporated from these documents shall be considered to be set forth fully in the Initial Study.

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Appendix A
Air Quality

A-1 CalEEMod Output

Bird Ponds - Marin County, Annual

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

Bird Ponds

Marin County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Golf Course	56.00	Acre	56.00	2,439,360.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	69
Climate Zone	5			**Operational Year**	2026
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 -

Land Use -

Construction Phase - Provide by client

Off-road Equipment - A Roller is representing the Discer, because they are about the same Hp and usage.

Off-road Equipment - Discer is represented as a roller because the are about the same HP and operate similarly.

Crawler tractor represents the LGP Track Dump Trucks

Off-road Equipment - The compactor is represented as a rollers because the are about the same HP and operate similarly.

Off-road Equipment - Discer and compactor are represented as rollers because the are about the same HP and operate similarly.

Crawler tractor represents the LGP Track Dump Trucks

Off-road Equipment - Roller represents compactor.

Crawler tractor represents the LGP Track Dump Trucks

Off-road Equipment - Other construction equipment is the Mower.

Crawler tractor represents the LGP Track Dump Trucks

Off-road Equipment - one ten ton Roller will be used.

Off-road Equipment - Crawler tractor represents the LGP Track Dump Trucks

Off-road Equipment - Crawler tractor represents the LGP Track Dump Trucks

Date: 11/10/2022 9:18 AM

Bird Ponds - Marin County, Annual

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

Off-road Equipment - The compactor is represented as rollers because the are about the same HP and operate similarly.
Crawler tractor represents the LGP Track Dump Trucks
Off-road Equipment - Roller is substituting for discer
Off Highway tractor represents the hydroseeder
Off-road Equipment - Other Construction Equipment is the Mower.
Crawler tractor represents the LGP Track Dump Truck
Grading - .

Water And Wastewater - No need to water the marsh. The march is represeted by a golf course.

Construction Off-road Equipment Mitigation -

Mobile Land Use Mitigation -

Water Mitigation - Marsh need no irrigation

Trips and VMT - See EMFAC results.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	110.00	22.00
tblConstructionPhase	NumDays	110.00	22.00
tblConstructionPhase	NumDays	110.00	65.00
tblConstructionPhase	NumDays	110.00	65.00
tblConstructionPhase	NumDays	110.00	44.00
tblConstructionPhase	NumDays	110.00	22.00
tblConstructionPhase	NumDays	110.00	44.00
tblConstructionPhase	NumDays	110.00	44.00
tblConstructionPhase	NumDays	110.00	22.00
tblConstructionPhase	NumDays	40.00	43.00
tblConstructionPhase	NumDays	40.00	22.00
tblGrading	AcresOfGrading	43.00	64.50
tblGrading	AcresOfGrading	130.00	195.00
tblGrading	AcresOfGrading	130.00	330.00
tblGrading	AcresOfGrading	22.00	15.00
tblGrading	AcresOfGrading	22.00	327.00
tblGrading	AcresOfGrading	33.00	66.00
tblGrading	AcresOfGrading	22.00	33.00

Bird Ponds - Marin County, Annual

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

tblGrading	AcresOfGrading	88.00	294.00
tblGrading	AcresOfGrading	88.00	33.00
tblGrading	AcresOfGrading	88.00	198.00
tblGrading	AcresOfGrading	11.00	66.00
tblGrading	AcresOfGrading	33.00	66.00
tblOffRoadEquipment	HorsePower	212.00	97.00
tblOffRoadEquipment	HorsePower	212.00	367.00
tblOffRoadEquipment	HorsePower	212.00	367.00
tblOffRoadEquipment	HorsePower	212.00	187.00
tblOffRoadEquipment	HorsePower	212.00	367.00
tblOffRoadEquipment	HorsePower	16.00	402.00
tblOffRoadEquipment	HorsePower	16.00	212.00
tblOffRoadEquipment	HorsePower	16.00	187.00
tblOffRoadEquipment	HorsePower	16.00	402.00
tblOffRoadEquipment	HorsePower	124.00	97.00
tblOffRoadEquipment	HorsePower	172.00	97.00
tblOffRoadEquipment	HorsePower	172.00	97.00
tblOffRoadEquipment	HorsePower	80.00	247.00
tblOffRoadEquipment	HorsePower	80.00	97.00
tblOffRoadEquipment	HorsePower	80.00	97.00
tblOffRoadEquipment	HorsePower	80.00	97.00
tblOffRoadEquipment	HorsePower	80.00	97.00
tblOffRoadEquipment	LoadFactor	0.43	0.37
tblOffRoadEquipment	LoadFactor	0.43	0.48
tblOffRoadEquipment	LoadFactor	0.43	0.48
tblOffRoadEquipment	LoadFactor	0.43	0.41
tblOffRoadEquipment	LoadFactor	0.43	0.48
tblOffRoadEquipment	LoadFactor	0.38	0.43
tblOffRoadEquipment	LoadFactor	0.38	0.41

Bird Ponds - Marin County, Annual

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

tblOffRoadEquipment	LoadFactor	0.44	0.37
tblOffRoadEquipment	LoadFactor	0.42	0.37
tblOffRoadEquipment	LoadFactor	0.42	0.37
tblOffRoadEquipment	LoadFactor	0.38	0.40
tblOffRoadEquipment	LoadFactor	0.38	0.37
tblOffRoadEquipment	LoadFactor	0.38	0.37
tblOffRoadEquipment	LoadFactor	0.38	0.37
tblOffRoadEquipment	LoadFactor	0.38	0.37
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	15.00	0.00
tblTripsAndVMT	WorkerTripNumber	18.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	20.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	13.00	0.00
tblTripsAndVMT	WorkerTripNumber	13.00	0.00
tblTripsAndVMT	WorkerTripNumber	18.00	0.00
tblTripsAndVMT	WorkerTripNumber	8.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00

Bird Ponds - Marin County, Annual

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

tblTripsAndVMT	WorkerTripNumber	5.00	0.00
tblWater	OutdoorWaterUseRate	66,722,955.58	0.00
tblWaterMitigation	UseWaterEfficientIrrigationSystemPercentReduction	6.1	0

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					
2024	0.2887	2.8636	2.2453	5.4200e-003	1.3811	0.1258	1.5069	0.5255	0.1158	0.6413	0.0000	475.9557	475.9557	0.1539	0.0000	479.8041
2025	0.1519	1.4584	1.1384	2.9500e-003	0.9621	0.0642	1.0263	0.3672	0.0591	0.4263	0.0000	259.2665	259.2665	0.0837	0.0000	261.3595
Maximum	**0.2887**	**2.8636**	**2.2453**	**5.4200e-003**	**1.3811**	**0.1258**	**1.5069**	**0.5255**	**0.1158**	**0.6413**	**0.0000**	**475.9557**	**475.9557**	**0.1539**	**0.0000**	**479.8041**

Mitigated 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					
2024	0.2887	2.8636	2.2453	5.4200e-003	0.6215	0.1258	0.7473	0.2365	0.1158	0.3523	0.0000	475.9552	475.9552	0.1539	0.0000	479.8035
2025	0.1519	1.4584	1.1384	2.9500e-003	0.4329	0.0642	0.4971	0.1653	0.0591	0.2243	0.0000	259.2662	259.2662	0.0837	0.0000	261.3592

Bird Ponds - Marin County, Annual

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

Maximum	**0.2887**	**2.8636**	**2.2453**	**5.4200e-003**	**0.6215**	**0.1258**	**0.7473**	**0.2365**	**0.1158**	**0.3523**	**0.0000**	**475.9552**	**475.9552**	**0.1539**	**0.0000**	**479.8035**

	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	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**55.00**	**0.00**	**50.87**	**55.00**	**0.00**	**45.99**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**5-1-2024**	**7-31-2024**	1.8693	1.8693
2	**8-1-2024**	**10-31-2024**	1.0128	1.0128
3	**11-1-2024**	**1-31-2025**	0.2581	0.2581
5	**5-1-2025**	**7-31-2025**	1.2737	1.2737
6	**8-1-2025**	**9-30-2025**	0.3132	0.3132
		Highest	1.8693	1.8693

2.2 Overall Operational

Unmitigated Operational

	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					
Area	0.0230	0.0000	5.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-003	1.0000e-003	0.0000	0.0000	1.0700e-003
Energy	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
Mobile	0.0813	0.0747	0.7107	1.4000e-003	0.1603	1.0200e-003	0.1614	0.0428	9.5000e-004	0.0438	0.0000	129.3330	129.3330	9.1400e-003	6.0200e-003	131.3543
Waste						0.0000	0.0000		0.0000	0.0000	10.5718	0.0000	10.5718	0.6248	0.0000	26.1911
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Bird Ponds - Marin County, Annual

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

Total	**0.1043**	**0.0747**	**0.7112**	**1.4000e-003**	**0.1603**	**1.0200e-003**	**0.1614**	**0.0428**	**9.5000e-004**	**0.0438**	**10.5718**	**129.3340**	**139.9058**	**0.6339**	**6.0200e-003**	**157.5465**

Mitigated Operational

	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					
Area	0.0230	0.0000	5.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-003	1.0000e-003	0.0000	0.0000	1.0700e-003
Energy	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
Mobile	0.0813	0.0747	0.7107	1.4000e-003	0.1603	1.0200e-003	0.1614	0.0428	9.5000e-004	0.0438	0.0000	129.3330	129.3330	9.1400e-003	6.0200e-003	131.3543
Waste						0.0000	0.0000		0.0000	0.0000	10.5718	0.0000	10.5718	0.6248	0.0000	26.1911
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1043**	**0.0747**	**0.7112**	**1.4000e-003**	**0.1603**	**1.0200e-003**	**0.1614**	**0.0428**	**9.5000e-004**	**0.0438**	**10.5718**	**129.3340**	**139.9058**	**0.6339**	**6.0200e-003**	**157.5465**

	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	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description

Bird Ponds - Marin County, Annual

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

1	S1 Site Preparation	Site Preparation	5/1/2024	6/28/2024	5	43	
2	S1 Bird Pond Excavation	Grading	6/1/2024	8/30/2024	5	65	
3	S1 Novato Creek Channel Excavation	Grading	6/1/2024	8/30/2024	5	65	
4	S1 Lynwood Levee Improvements	Grading	8/31/2024	10/31/2024	5	44	
5	S1 Novato Creek Farmers Left Bank	Grading	10/31/2024	11/29/2024	5	22	
6	S2 Site Prep	Site Preparation	5/1/2025	5/30/2025	5	22	
7	S2 Duck Bill and Herons Beak Levee Excavation	Grading	6/1/2025	7/31/2025	5	44	
8	S2 Lynwood Levee Improvements	Grading	6/1/2025	7/31/2025	5	44	
9	S2 AB surface on Levees	Grading	9/1/2025	9/30/2025	5	22	
10	S2 Breaches/Connector Channels	Grading	9/1/2025	9/30/2025	5	22	
11	S2 Revegetation	Grading	9/1/2025	9/30/2025	5	22	

Acres of Grading (Site Preparation Phase): 64.5

Acres of Grading (Grading Phase): 195

Acres of Paving: 0

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
S1 Site Preparation	Crawler Tractors	1	8.00	212	0.43
S1 Site Preparation	Dumpers/Tenders	1	8.00	402	0.38
S1 Site Preparation	Other Construction Equipment	1	8.00	97	0.37
S1 Site Preparation	Rubber Tired Dozers	1	8.00	247	0.40
S1 Bird Pond Excavation	Crawler Tractors	3	8.00	367	0.48
S1 Bird Pond Excavation	Excavators	1	8.00	158	0.38
S1 Bird Pond Excavation	Rollers	1	8.00	97	0.37
S1 Bird Pond Excavation	Rubber Tired Dozers	1	8.00	247	0.40
S1 Novato Creek Channel Excavation	Crawler Tractors	3	8.00	367	0.48

Bird Ponds - Marin County, Annual

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

S1 Novato Creek Channel Excavation	Excavators	1	8.00	158	0.38
S1 Novato Creek Channel Excavation	Rollers	2	8.00	97	0.37
S1 Novato Creek Channel Excavation	Rubber Tired Dozers	1	8.00	247	0.40
S1 Lynwood Levee Improvements	Dumpers/Tenders	1	8.00	212	0.43
S1 Lynwood Levee Improvements	Excavators	1	8.00	158	0.38
S1 Lynwood Levee Improvements	Rollers	1	8.00	80	0.38
S1 Lynwood Levee Improvements	Rubber Tired Dozers	1	8.00	247	0.40
S1 Novato Creek Farmers Left Bank...	Crawler Tractors	2	8.00	212	0.43
S1 Novato Creek Farmers Left Bank...	Dumpers/Tenders	1	8.00	187	0.41
S1 Novato Creek Farmers Left Bank...	Excavators	2	8.00	158	0.38
S1 Novato Creek Farmers Left Bank...	Off-Highway Trucks	1	4.00	402	0.38
S1 Novato Creek Farmers Left Bank...	Rollers	1	8.00	80	0.38
S1 Novato Creek Farmers Left Bank...	Rubber Tired Dozers	1	8.00	247	0.40
S2 Site Prep	Crawler Tractors	1	8.00	212	0.43
S2 Site Prep	Dumpers/Tenders	1	8.00	402	0.38
S2 Site Prep	Other Construction Equipment	1	8.00	97	0.37
S2 Site Prep	Rubber Tired Dozers	1	8.00	247	0.40
S2 Duck Bill and Herons Beak Levee Excavation	Crawler Tractors	3	8.00	187	0.41
S2 Duck Bill and Herons Beak Levee Excavation	Excavators	1	8.00	158	0.38
S2 Duck Bill and Herons Beak Levee Excavation	Rubber Tired Dozers	1	8.00	247	0.40
S2 Lynwood Levee Improvements	Crawler Tractors	3	8.00	367	0.48
S2 Lynwood Levee Improvements	Excavators	1	8.00	158	0.38
S2 Lynwood Levee Improvements	Off-Highway Trucks	1	4.00	402	0.38
S2 Lynwood Levee Improvements	Rollers	1	8.00	97	0.37
S2 Lynwood Levee Improvements	Rubber Tired Dozers	1	8.00	247	0.40
S2 AB surface on Levees	Dumpers/Tenders	1	8.00	16	0.38
S2 AB surface on Levees	Rollers	1	8.00	97	0.37
S2 AB surface on Levees	Rubber Tired Dozers	1	8.00	247	0.40
S2 Breaches/Connector Channels	Crawler Tractors	2	8.00	97	0.37

Bird Ponds - Marin County, Annual

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

S2 Breaches/Connector Channels	Excavators	1	8.00	158	0.38
S2 Breaches/Connector Channels	Rubber Tired Dozers	1	8.00	247	0.40
S2 Revegetation	Off-Highway Tractors	1	8.00	97	0.37
S2 Revegetation	Rollers	1	8.00	247	0.40

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
S1 Site Preparation	4	0.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
S1 Bird Pond Excavation	6	0.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
S1 Novato Creek Channel Excavation	7	0.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
S1 Lynwood Levee Improvements	4	0.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
S1 Lynwood Levee Improvements	4	0.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
S1 Novato Creek Farmers Left Bank	8	0.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
S2 Site Prep	4	0.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
S2 Duck Bill and Herons Beak Levee Excavation	5	0.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
S2 Duck Bill and Herons Beak Levee Excavation	5	0.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
S2 Lynwood Levee Improvements	7	0.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
S2 AB surface on Levees	3	0.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
S2 Breaches/Connector Channels	4	0.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
S2 Revegetation	2	0.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 S1 Site Preparation - 2024

Unmitigated Construction On-Site

Bird Ponds - Marin County, Annual

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

	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					0.1637	0.0000	0.1637	0.0749	0.0000	0.0749	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0293	0.3041	0.1639	4.2000e-004		0.0141	0.0141		0.0130	0.0130	0.0000	36.7559	36.7559	0.0119	0.0000	37.0530
Total	**0.0293**	**0.3041**	**0.1639**	**4.2000e-004**	**0.1637**	**0.0141**	**0.1778**	**0.0749**	**0.0130**	**0.0878**	**0.0000**	**36.7559**	**36.7559**	**0.0119**	**0.0000**	**37.0530**

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	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
Total	**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**

Mitigated Construction On-Site

Bird Ponds - Marin County, Annual

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

	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					0.0737	0.0000	0.0737	0.0337	0.0000	0.0337	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0293	0.3041	0.1639	4.2000e-004		0.0141	0.0141		0.0130	0.0130	0.0000	36.7558	36.7558	0.0119	0.0000	37.0530
Total	**0.0293**	**0.3041**	**0.1639**	**4.2000e-004**	**0.0737**	**0.0141**	**0.0877**	**0.0337**	**0.0130**	**0.0467**	**0.0000**	**36.7558**	**36.7558**	**0.0119**	**0.0000**	**37.0530**

Mitigated 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	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
Total	**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**

3.3 S1 Bird Pond Excavation - 2024

Unmitigated Construction On-Site

Bird Ponds - Marin County, Annual

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

	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					0.2991	0.0000	0.2991	0.1188	0.0000	0.1188	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1031	1.0155	0.8180	2.0300e-003		0.0438	0.0438		0.0403	0.0403	0.0000	178.2448	178.2448	0.0577	0.0000	179.6860
Total	**0.1031**	**1.0155**	**0.8180**	**2.0300e-003**	**0.2991**	**0.0438**	**0.3429**	**0.1188**	**0.0403**	**0.1591**	**0.0000**	**178.2448**	**178.2448**	**0.0577**	**0.0000**	**179.6860**

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	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
Total	**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**

Mitigated Construction On-Site

Bird Ponds - Marin County, Annual

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

	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					0.1346	0.0000	0.1346	0.0534	0.0000	0.0534	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1031	1.0155	0.8180	2.0300e-003		0.0438	0.0438		0.0403	0.0403	0.0000	178.2446	178.2446	0.0577	0.0000	179.6858
Total	**0.1031**	**1.0155**	**0.8180**	**2.0300e-003**	**0.1346**	**0.0438**	**0.1784**	**0.0534**	**0.0403**	**0.0938**	**0.0000**	**178.2446**	**178.2446**	**0.0577**	**0.0000**	**179.6858**

Mitigated 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	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
Total	**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**

3.4 S1 Novato Creek Channel Excavation - 2024

Unmitigated Construction On-Site

Bird Ponds - Marin County, Annual

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

	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					0.3707	0.0000	0.3707	0.1265	0.0000	0.1265	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1086	1.0740	0.8890	2.1300e-003		0.0469	0.0469		0.0432	0.0432	0.0000	187.0911	187.0911	0.0605	0.0000	188.6038
Total	**0.1086**	**1.0740**	**0.8890**	**2.1300e-003**	**0.3707**	**0.0469**	**0.4176**	**0.1265**	**0.0432**	**0.1696**	**0.0000**	**187.0911**	**187.0911**	**0.0605**	**0.0000**	**188.6038**

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	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
Total	**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**

Mitigated Construction On-Site

Bird Ponds - Marin County, Annual

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

	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					0.1668	0.0000	0.1668	0.0569	0.0000	0.0569	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1086	1.0740	0.8890	2.1300e-003		0.0469	0.0469		0.0432	0.0432	0.0000	187.0909	187.0909	0.0605	0.0000	188.6036
Total	**0.1086**	**1.0740**	**0.8890**	**2.1300e-003**	**0.1668**	**0.0469**	**0.2137**	**0.0569**	**0.0432**	**0.1001**	**0.0000**	**187.0909**	**187.0909**	**0.0605**	**0.0000**	**188.6036**

Mitigated 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	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
Total	**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**

3.5 S1 Lynwood Levee Improvements - 2024

Unmitigated Construction On-Site

Bird Ponds - Marin County, Annual

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

	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					0.4463	0.0000	0.4463	0.1652	0.0000	0.1652	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0225	0.2212	0.1814	3.6000e-004		0.0104	0.0104		9.5300e-003	9.5300e-003	0.0000	31.5615	31.5615	0.0102	0.0000	31.8167
Total	**0.0225**	**0.2212**	**0.1814**	**3.6000e-004**	**0.4463**	**0.0104**	**0.4567**	**0.1652**	**9.5300e-003**	**0.1748**	**0.0000**	**31.5615**	**31.5615**	**0.0102**	**0.0000**	**31.8167**

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	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
Total	**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**

Mitigated Construction On-Site

Bird Ponds - Marin County, Annual

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

	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					0.2008	0.0000	0.2008	0.0744	0.0000	0.0744	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0225	0.2212	0.1814	3.6000e-004		0.0104	0.0104		9.5300e-003	9.5300e-003	0.0000	31.5615	31.5615	0.0102	0.0000	31.8167
Total	**0.0225**	**0.2212**	**0.1814**	**3.6000e-004**	**0.2008**	**0.0104**	**0.2112**	**0.0744**	**9.5300e-003**	**0.0839**	**0.0000**	**31.5615**	**31.5615**	**0.0102**	**0.0000**	**31.8167**

Mitigated 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	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
Total	**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**

3.6 S1 Novato Creek Farmers Left Bank... - 2024

Unmitigated Construction On-Site

Bird Ponds - Marin County, Annual

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

	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					0.1012	0.0000	0.1012	0.0402	0.0000	0.0402	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0253	0.2488	0.1930	4.8000e-004		0.0107	0.0107		9.8000e-003	9.8000e-003	0.0000	42.3025	42.3025	0.0137	0.0000	42.6445
Total	**0.0253**	**0.2488**	**0.1930**	**4.8000e-004**	**0.1012**	**0.0107**	**0.1119**	**0.0402**	**9.8000e-003**	**0.0500**	**0.0000**	**42.3025**	**42.3025**	**0.0137**	**0.0000**	**42.6445**

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	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
Total	**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**

Mitigated Construction On-Site

Bird Ponds - Marin County, Annual

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

	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					0.0456	0.0000	0.0456	0.0181	0.0000	0.0181	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0253	0.2488	0.1930	4.8000e-004		0.0107	0.0107		9.8000e-003	9.8000e-003	0.0000	42.3024	42.3024	0.0137	0.0000	42.6445
Total	**0.0253**	**0.2488**	**0.1930**	**4.8000e-004**	**0.0456**	**0.0107**	**0.0562**	**0.0181**	**9.8000e-003**	**0.0279**	**0.0000**	**42.3024**	**42.3024**	**0.0137**	**0.0000**	**42.6445**

Mitigated 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	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
Total	**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**

3.7 S2 Site Prep - 2025

Unmitigated Construction On-Site

Bird Ponds - Marin County, Annual

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

	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					0.0837	0.0000	0.0837	0.0383	0.0000	0.0383	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0136	0.1391	0.0811	2.1000e-004		6.3000e-003	6.3000e-003		5.8000e-003	5.8000e-003	0.0000	18.8052	18.8052	6.0800e-003	0.0000	18.9573
Total	**0.0136**	**0.1391**	**0.0811**	**2.1000e-004**	**0.0837**	**6.3000e-003**	**0.0900**	**0.0383**	**5.8000e-003**	**0.0441**	**0.0000**	**18.8052**	**18.8052**	**6.0800e-003**	**0.0000**	**18.9573**

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	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
Total	**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**

Mitigated Construction On-Site

Bird Ponds - Marin County, Annual

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

	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					0.0377	0.0000	0.0377	0.0172	0.0000	0.0172	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0136	0.1391	0.0811	2.1000e-004		6.3000e-003	6.3000e-003		5.8000e-003	5.8000e-003	0.0000	18.8052	18.8052	6.0800e-003	0.0000	18.9573
Total	**0.0136**	**0.1391**	**0.0811**	**2.1000e-004**	**0.0377**	**6.3000e-003**	**0.0440**	**0.0172**	**5.8000e-003**	**0.0230**	**0.0000**	**18.8052**	**18.8052**	**6.0800e-003**	**0.0000**	**18.9573**

Mitigated 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	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
Total	**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**

3.8 S2 Duck Bill and Herons Beak Levee Excavation - 2025

Unmitigated Construction On-Site

Bird Ponds - Marin County, Annual

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

	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					0.4384	0.0000	0.4384	0.1644	0.0000	0.1644	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0387	0.3925	0.2544	7.4000e-004		0.0163	0.0163		0.0150	0.0150	0.0000	64.6745	64.6745	0.0209	0.0000	65.1974
Total	**0.0387**	**0.3925**	**0.2544**	**7.4000e-004**	**0.4384**	**0.0163**	**0.4546**	**0.1644**	**0.0150**	**0.1793**	**0.0000**	**64.6745**	**64.6745**	**0.0209**	**0.0000**	**65.1974**

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	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
Total	**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**

Mitigated Construction On-Site

Bird Ponds - Marin County, Annual

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

	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					0.1973	0.0000	0.1973	0.0740	0.0000	0.0740	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0387	0.3925	0.2544	7.4000e-004		0.0163	0.0163		0.0150	0.0150	0.0000	64.6744	64.6744	0.0209	0.0000	65.1974
Total	**0.0387**	**0.3925**	**0.2544**	**7.4000e-004**	**0.1973**	**0.0163**	**0.2135**	**0.0740**	**0.0150**	**0.0889**	**0.0000**	**64.6744**	**64.6744**	**0.0209**	**0.0000**	**65.1974**

Mitigated 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	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
Total	**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**

3.9 S2 Lynwood Levee Improvements - 2025

Unmitigated Construction On-Site

Bird Ponds - Marin County, Annual

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

	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					0.2375	0.0000	0.2375	0.0842	0.0000	0.0842	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0694	0.6355	0.5727	1.5200e-003		0.0272	0.0272		0.0250	0.0250	0.0000	133.4237	133.4237	0.0432	0.0000	134.5025
Total	**0.0694**	**0.6355**	**0.5727**	**1.5200e-003**	**0.2375**	**0.0272**	**0.2647**	**0.0842**	**0.0250**	**0.1092**	**0.0000**	**133.4237**	**133.4237**	**0.0432**	**0.0000**	**134.5025**

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	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
Total	**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**

Mitigated Construction On-Site

Bird Ponds - Marin County, Annual

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

	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					0.1069	0.0000	0.1069	0.0379	0.0000	0.0379	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0694	0.6355	0.5727	1.5200e-003		0.0272	0.0272		0.0250	0.0250	0.0000	133.4235	133.4235	0.0432	0.0000	134.5023
Total	**0.0694**	**0.6355**	**0.5727**	**1.5200e-003**	**0.1069**	**0.0272**	**0.1341**	**0.0379**	**0.0250**	**0.0629**	**0.0000**	**133.4235**	**133.4235**	**0.0432**	**0.0000**	**134.5023**

Mitigated 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	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
Total	**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**

3.10 S2 AB surface on Levees - 2025

Unmitigated Construction On-Site

Bird Ponds - Marin County, Annual

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

	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					0.1012	0.0000	0.1012	0.0402	0.0000	0.0402	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.7200e-003	0.0968	0.0597	1.4000e-004		4.3200e-003	4.3200e-003		3.9900e-003	3.9900e-003	0.0000	11.8535	11.8535	3.7000e-003	0.0000	11.9461
Total	**9.7200e-003**	**0.0968**	**0.0597**	**1.4000e-004**	**0.1012**	**4.3200e-003**	**0.1056**	**0.0402**	**3.9900e-003**	**0.0442**	**0.0000**	**11.8535**	**11.8535**	**3.7000e-003**	**0.0000**	**11.9461**

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	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
Total	**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**

Mitigated Construction On-Site

Bird Ponds - Marin County, Annual

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

	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					0.0456	0.0000	0.0456	0.0181	0.0000	0.0181	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.7200e-003	0.0968	0.0597	1.4000e-004		4.3200e-003	4.3200e-003		3.9900e-003	3.9900e-003	0.0000	11.8535	11.8535	3.7000e-003	0.0000	11.9461
Total	**9.7200e-003**	**0.0968**	**0.0597**	**1.4000e-004**	**0.0456**	**4.3200e-003**	**0.0499**	**0.0181**	**3.9900e-003**	**0.0221**	**0.0000**	**11.8535**	**11.8535**	**3.7000e-003**	**0.0000**	**11.9461**

Mitigated 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	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
Total	**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**

3.11 S2 Breaches/Connector Channels - 2025

Unmitigated Construction On-Site

Bird Ponds - Marin County, Annual

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

	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					0.1012	0.0000	0.1012	0.0402	0.0000	0.0402	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0153	0.1415	0.1216	2.2000e-004		7.8200e-003	7.8200e-003		7.1900e-003	7.1900e-003	0.0000	19.2603	19.2603	6.2300e-003	0.0000	19.4160
Total	**0.0153**	**0.1415**	**0.1216**	**2.2000e-004**	**0.1012**	**7.8200e-003**	**0.1091**	**0.0402**	**7.1900e-003**	**0.0474**	**0.0000**	**19.2603**	**19.2603**	**6.2300e-003**	**0.0000**	**19.4160**

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	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
Total	**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**

Mitigated Construction On-Site

Bird Ponds - Marin County, Annual

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

	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					0.0456	0.0000	0.0456	0.0181	0.0000	0.0181	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0153	0.1415	0.1216	2.2000e-004		7.8200e-003	7.8200e-003		7.1900e-003	7.1900e-003	0.0000	19.2603	19.2603	6.2300e-003	0.0000	19.4160
Total	**0.0153**	**0.1415**	**0.1216**	**2.2000e-004**	**0.0456**	**7.8200e-003**	**0.0534**	**0.0181**	**7.1900e-003**	**0.0253**	**0.0000**	**19.2603**	**19.2603**	**6.2300e-003**	**0.0000**	**19.4160**

Mitigated 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	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
Total	**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**

3.12 S2 Revegetation - 2025

Unmitigated Construction On-Site

Bird Ponds - Marin County, Annual

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

	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	5.2400e-003	0.0530	0.0488	1.3000e-004		2.2600e-003	2.2600e-003		2.0800e-003	2.0800e-003	0.0000	11.2493	11.2493	3.6400e-003	0.0000	11.3402
Total	**5.2400e-003**	**0.0530**	**0.0488**	**1.3000e-004**	**0.0000**	**2.2600e-003**	**2.2600e-003**	**0.0000**	**2.0800e-003**	**2.0800e-003**	**0.0000**	**11.2493**	**11.2493**	**3.6400e-003**	**0.0000**	**11.3402**

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	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
Total	**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**

Mitigated Construction On-Site

Bird Ponds - Marin County, Annual

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

	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	5.2400e-003	0.0530	0.0488	1.3000e-004		2.2600e-003	2.2600e-003		2.0800e-003	2.0800e-003	0.0000	11.2493	11.2493	3.6400e-003	0.0000	11.3402
Total	**5.2400e-003**	**0.0530**	**0.0488**	**1.3000e-004**	**0.0000**	**2.2600e-003**	**2.2600e-003**	**0.0000**	**2.0800e-003**	**2.0800e-003**	**0.0000**	**11.2493**	**11.2493**	**3.6400e-003**	**0.0000**	**11.3402**

Mitigated 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	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
Total	**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**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Bird Ponds - Marin County, Annual

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

	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					
Mitigated	0.0813	0.0747	0.7107	1.4000e-003	0.1603	1.0200e-003	0.1614	0.0428	9.5000e-004	0.0438	0.0000	129.3330	129.3330	9.1400e-003	6.0200e-003	131.3543
Unmitigated	0.0813	0.0747	0.7107	1.4000e-003	0.1603	1.0200e-003	0.1614	0.0428	9.5000e-004	0.0438	0.0000	129.3330	129.3330	9.1400e-003	6.0200e-003	131.3543

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Golf Course	209.44	209.44	209.44	437,220	437,220
Total	209.44	209.44	209.44	437,220	437,220

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Golf Course	14.70	6.60	6.60	33.00	48.00	19.00	52	39	9

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Golf Course	0.543132	0.061625	0.200801	0.122893	0.023519	0.005568	0.006832	0.003721	0.000658	0.000395	0.027388	0.000726	0.002741

5.0 Energy Detail

Historical Energy Use: N

Bird Ponds - Marin County, Annual

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

5.1 Mitigation Measures Energy

	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					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	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
NaturalGas Unmitigated	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

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	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
Land Use	kBTU/yr	tons/yr										MT/yr					
Golf Course	0	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
Total		**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**

Bird Ponds - Marin County, Annual

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

Mitigated

	NaturalGas Use	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
Land Use	kBTU/yr	tons/yr										MT/yr					
Golf Course	0	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
Total		**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**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	t o n MT/yr			
Golf Course	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

Bird Ponds - Marin County, Annual

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

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	t o n	MT/yr		
Golf Course	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	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					
Mitigated	0.0230	0.0000	5.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-003	1.0000e-003	0.0000	0.0000	1.0700e-003
Unmitigated	0.0230	0.0000	5.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-003	1.0000e-003	0.0000	0.0000	1.0700e-003

6.2 Area by SubCategory

Unmitigated

	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

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

SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0229					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	5.0000e-005	0.0000	5.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-003	1.0000e-003	0.0000	0.0000	1.0700e-003
Total	**0.0230**	**0.0000**	**5.1000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.0000e-003**	**1.0000e-003**	**0.0000**	**0.0000**	**1.0700e-003**

Mitigated

	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
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0229					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	5.0000e-005	0.0000	5.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-003	1.0000e-003	0.0000	0.0000	1.0700e-003
Total	**0.0230**	**0.0000**	**5.1000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.0000e-003**	**1.0000e-003**	**0.0000**	**0.0000**	**1.0700e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

Bird Ponds - Marin County, Annual

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

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Golf Course	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

Bird Ponds - Marin County, Annual

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

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Golf Course	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	10.5718	0.6248	0.0000	26.1911
Unmitigated	10.5718	0.6248	0.0000	26.1911

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e

Bird Ponds - Marin County, Annual

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

Land Use	tons	MT/yr			
Golf Course	52.08	10.5718	0.6248	0.0000	26.1911
Total		**10.5718**	**0.6248**	**0.0000**	**26.1911**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Golf Course	52.08	10.5718	0.6248	0.0000	26.1911
Total		**10.5718**	**0.6248**	**0.0000**	**26.1911**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Bird Ponds - Marin County, Annual

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

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Deer Island - Marin County, Annual

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

Deer Island

Marin County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Golf Course	131.00	Acre	131.00	5,706,360.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	69
Climate Zone	5			**Operational Year**	2027
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 -

Land Use -

Construction Phase - Provide by client

Off-road Equipment - Discers and Compactors are represented as a rollers because they are approx. the same HP, and these option donot exist in CALEEMOD. Represents a maximum use day during this phase

Off-road Equipment - Rollers represent the discer and compactor

Off-road Equipment - Onsite dump trucks represented by Dumper/Tenders

Off-road Equipment - Provided by Client.

Off-road Equipment - Provided by client. The dump truck is represented as a "Dumper/Tender". Represents a maximum use day during this phase

Off-road Equipment - Crawler Tractors represent the LGP Dump trucks

Off-road Equipment - Concrete delivery trucks are represented by Off-Highway Trucks.

Off-road Equipment - One Ton Roller

Off-road Equipment - Dumper/Tenders represent the Dump Truck

Date: 11/10/2022 9:36 AM

Deer Island - Marin County, Annual

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

Off-road Equipment - Crawler tractors represent the LGP dump trucks

Off-road Equipment - Water trucks represented by Off-Highway Trucks

Discers and compactors are represeted by Rollers

Off-road Equipment - Rollers are representing discers.

Tractor represents the hydroseeder

Trips and VMT - see EMFAC spreadsheet

Grading -

Water And Wastewater - No need to water the marsh. The march is represeted by a golf course.

Construction Off-road Equipment Mitigation -

Water Mitigation - Marsh need no irrigation

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	3,100.00	44.00
tblConstructionPhase	NumDays	310.00	22.00
tblConstructionPhase	NumDays	310.00	22.00
tblConstructionPhase	NumDays	310.00	88.00
tblConstructionPhase	NumDays	310.00	66.00
tblConstructionPhase	NumDays	310.00	110.00
tblConstructionPhase	NumDays	310.00	87.00
tblConstructionPhase	NumDays	310.00	22.00
tblConstructionPhase	NumDays	310.00	44.00
tblConstructionPhase	NumDays	310.00	22.00
tblConstructionPhase	NumDays	120.00	65.00
tblGrading	MaterialImported	0.00	1,700.00
tblGrading	MaterialImported	0.00	1,700.00
tblOffRoadEquipment	HorsePower	212.00	187.00
tblOffRoadEquipment	HorsePower	212.00	367.00
tblOffRoadEquipment	HorsePower	212.00	187.00
tblOffRoadEquipment	HorsePower	212.00	247.00
tblOffRoadEquipment	HorsePower	16.00	97.00
tblOffRoadEquipment	HorsePower	16.00	9.00

Deer Island - Marin County, Annual

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

tblOffRoadEquipment	HorsePower	16.00	187.00
tblOffRoadEquipment	HorsePower	402.00	97.00
tblOffRoadEquipment	HorsePower	172.00	97.00
tblOffRoadEquipment	HorsePower	80.00	247.00
tblOffRoadEquipment	HorsePower	80.00	367.00
tblOffRoadEquipment	HorsePower	80.00	97.00
tblOffRoadEquipment	HorsePower	80.00	247.00
tblOffRoadEquipment	HorsePower	80.00	97.00
tblOffRoadEquipment	HorsePower	203.00	158.00
tblOffRoadEquipment	LoadFactor	0.43	0.41
tblOffRoadEquipment	LoadFactor	0.43	0.48
tblOffRoadEquipment	LoadFactor	0.43	0.41
tblOffRoadEquipment	LoadFactor	0.43	0.40
tblOffRoadEquipment	LoadFactor	0.38	0.37
tblOffRoadEquipment	LoadFactor	0.38	0.56
tblOffRoadEquipment	LoadFactor	0.38	0.41
tblOffRoadEquipment	LoadFactor	0.38	0.37
tblOffRoadEquipment	LoadFactor	0.42	0.37
tblOffRoadEquipment	LoadFactor	0.38	0.40
tblOffRoadEquipment	LoadFactor	0.38	0.48
tblOffRoadEquipment	LoadFactor	0.38	0.37
tblOffRoadEquipment	LoadFactor	0.38	0.40
tblOffRoadEquipment	LoadFactor	0.38	0.37
tblOffRoadEquipment	LoadFactor	0.36	0.38
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	6.00

Deer Island - Marin County, Annual

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

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	213.00	0.00
tblTripsAndVMT	HaulingTripNumber	213.00	0.00
tblTripsAndVMT	VendorTripNumber	935.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	5.00	0.00
tblTripsAndVMT	WorkerTripNumber	15.00	0.00
tblTripsAndVMT	WorkerTripNumber	30.00	0.00
tblTripsAndVMT	WorkerTripNumber	23.00	0.00
tblTripsAndVMT	WorkerTripNumber	48.00	0.00
tblTripsAndVMT	WorkerTripNumber	5.00	0.00
tblTripsAndVMT	WorkerTripNumber	18.00	0.00
tblTripsAndVMT	WorkerTripNumber	2,397.00	0.00
tblTripsAndVMT	WorkerTripNumber	8.00	0.00

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					

Deer Island - Marin County, Annual

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

2026	0.5094	5.0350	3.7768	9.7400e-003	2.3027	0.2167	2.5194	1.0959	0.1994	1.2952	0.0000	855.0978	855.0978	0.2766	0.0000	862.0117
2027	0.3949	3.9657	2.5470	7.6000e-003	1.9617	0.1643	2.1260	0.9353	0.1512	1.0865	0.0000	667.2923	667.2923	0.2157	0.0000	672.6844
Maximum	**0.5094**	**5.0350**	**3.7768**	**9.7400e-003**	**2.3027**	**0.2167**	**2.5194**	**1.0959**	**0.1994**	**1.2952**	**0.0000**	**855.0978**	**855.0978**	**0.2766**	**0.0000**	**862.0117**

Mitigated 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					
2026	0.5094	5.0350	3.7768	9.7400e-003	1.0362	0.2167	1.2529	0.4931	0.1994	0.6925	0.0000	855.0968	855.0968	0.2766	0.0000	862.0107
2027	0.3949	3.9656	2.5470	7.6000e-003	0.8828	0.1643	1.0471	0.4209	0.1512	0.5721	0.0000	667.2915	667.2915	0.2157	0.0000	672.6836
Maximum	**0.5094**	**5.0350**	**3.7768**	**9.7400e-003**	**1.0362**	**0.2167**	**1.2529**	**0.4931**	**0.1994**	**0.6925**	**0.0000**	**855.0968**	**855.0968**	**0.2766**	**0.0000**	**862.0107**

	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	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**55.00**	**0.00**	**50.49**	**55.00**	**0.00**	**46.91**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**5-1-2026**	**7-31-2026**	3.1041	3.1041
2	**8-1-2026**	**10-31-2026**	2.4071	2.4071
5	**5-1-2027**	**7-31-2027**	2.9142	2.9142
6	**8-1-2027**	**9-30-2027**	1.4758	1.4758
		Highest	3.1041	3.1041

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

2.2 Overall Operational

Unmitigated Operational

	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					
Area	0.0538	1.0000e-005	1.2000e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.3400e-003	2.3400e-003	1.0000e-005	0.0000	2.4900e-003
Energy	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
Mobile	0.1829	0.1657	1.6065	3.1900e-003	0.3751	2.2800e-003	0.3773	0.1001	2.1200e-003	0.1023	0.0000	294.1738	294.1738	0.0206	0.0136	298.7410
Waste						0.0000	0.0000		0.0000	0.0000	24.7304	0.0000	24.7304	1.4615	0.0000	61.2685
Water						0.0000	0.0000		0.0000	0.0000	0.0000	50.5452	50.5452	8.1800e-003	9.9000e-004	51.0450
Total	**0.2367**	**0.1657**	**1.6077**	**3.1900e-003**	**0.3751**	**2.2800e-003**	**0.3773**	**0.1001**	**2.1200e-003**	**0.1023**	**24.7304**	**344.7213**	**369.4517**	**1.4903**	**0.0146**	**411.0570**

Mitigated Operational

	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					
Area	0.0538	1.0000e-005	1.2000e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.3400e-003	2.3400e-003	1.0000e-005	0.0000	2.4900e-003
Energy	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

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

Mobile	0.1829	0.1657	1.6065	3.1900e-003	0.3751	2.2800e-003	0.3773	0.1001	2.1200e-003	0.1023	0.0000	294.1738	294.1738	0.0206	0.0136	298.7410
Waste						0.0000	0.0000		0.0000	0.0000	24.7304	0.0000	24.7304	1.4615	0.0000	61.2685
Water						0.0000	0.0000		0.0000	0.0000	0.0000	50.5452	50.5452	8.1800e-003	9.9000e-004	51.0450
Total	**0.2367**	**0.1657**	**1.6077**	**3.1900e-003**	**0.3751**	**2.2800e-003**	**0.3773**	**0.1001**	**2.1200e-003**	**0.1023**	**24.7304**	**344.7213**	**369.4517**	**1.4903**	**0.0146**	**411.0570**

	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	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	S1 Site Preparation	Site Preparation	5/1/2026	7/30/2026	5	65	
2	S1 Novato Creek Channel Excavation	Grading	6/1/2026	9/30/2026	5	88	
3	S1 Interior Tidal Channel Excavation	Grading	6/1/2026	8/31/2026	5	66	
4	S1 New NSD Force Main Levees and Berms	Grading	6/1/2026	10/31/2026	5	110	
5	S2 NSD Levee and Berms	Grading	5/1/2027	8/31/2027	5	87	
6	S2 New NSD WWTP Levee	Grading	6/1/2027	6/30/2027	5	22	
7	S2 Novato Creek Left Bank Excavation	Grading	7/1/2027	8/31/2027	5	44	
8	S2 Concrete for Water Control Structures	Building Construction	7/1/2027	8/31/2027	5	44	
9	S2 New Levee Surfacing	Grading	9/1/2027	9/30/2027	5	22	
10	S2 Breaches & Tidal Connector Channel Exc	Grading	9/1/2027	9/30/2027	5	22	
11	S2 Revegetation	Grading	9/1/2027	9/30/2027	5	22	

Acres of Grading (Site Preparation Phase): 65

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

Acres of Grading (Grading Phase): 176

Acres of Paving: 0

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
S1 Site Preparation	Crawler Tractors	1	8.00	212	0.43
S1 Site Preparation	Dumpers/Tenders	1	8.00	97	0.37
S1 Site Preparation	Other Construction Equipment	1	8.00	97	0.37
S1 Site Preparation	Rubber Tired Dozers	1	8.00	247	0.40
S1 Novato Creek Channel Excavation	Crawler Tractors	4	8.00	367	0.48
S1 Novato Creek Channel Excavation	Excavators	2	8.00	158	0.38
S1 Interior Tidal Channel Excavation	Crawler Tractors	6	8.00	212	0.43
S1 Interior Tidal Channel Excavation	Excavators	2	8.00	158	0.38
S1 Interior Tidal Channel Excavation	Rollers	2	8.00	367	0.48
S1 Interior Tidal Channel Excavation	Rubber Tired Dozers	2	8.00	247	0.40
S1 New NSD Force Main Levees and Berms	Dumpers/Tenders	2	7.00	9	0.56
S1 New NSD Force Main Levees and Berms	Excavators	1	8.00	158	0.38
S1 New NSD Force Main Levees and Berms	Rollers	2	8.00	97	0.37
S1 New NSD Force Main Levees and Berms	Rubber Tired Dozers	4	8.00	247	0.40
S2 NSD Levee and Berms	Crawler Tractors	5	8.00	187	0.41
S2 NSD Levee and Berms	Excavators	2	8.00	158	0.38
S2 NSD Levee and Berms	Off-Highway Trucks	2	8.00	97	0.37
S2 NSD Levee and Berms	Rollers	4	8.00	247	0.40
S2 NSD Levee and Berms	Rubber Tired Dozers	6	8.00	247	0.40
S2 New NSD WWTP Levee	Dumpers/Tenders	1	8.00	187	0.41
S2 New NSD WWTP Levee	Rubber Tired Loaders	1	8.00	158	0.38
S2 Novato Creek Left Bank Excavation	Crawler Tractors	4	8.00	247	0.40
S2 Novato Creek Left Bank Excavation	Excavators	2	8.00	158	0.38

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

S2 Novato Creek Left Bank Excavation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
S2 Concrete for Water Control Structures	Cranes	1	7.00	231	0.29
S2 Concrete for Water Control Structures	Off-Highway Trucks	1	7.00	402	0.38
S2 New Levee Surfacing	Dumpers/Tenders	1	8.00	16	0.38
S2 New Levee Surfacing	Rollers	1	8.00	97	0.37
S2 New Levee Surfacing	Rubber Tired Dozers	1	8.00	247	0.40
S2 Breaches & Tidal Connector Channel Exc	Crawler Tractors	3	8.00	187	0.41
S2 Breaches & Tidal Connector Channel Exc	Excavators	1	8.00	158	0.38
S2 Revegetation	Rollers	1	8.00	247	0.40
S2 Revegetation	Tractors/Loaders/Backhoes	1	8.00	97	0.37

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
S1 Site Preparation	4	0.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
S1 Novato Creek Channel Excavation	6	0.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
S1 Interior Tidal Channel Excavation	12	0.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
S1 New NSD Force Main Levees and Berms	9	0.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
S2 NSD Levee and Berms	19	0.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
S2 New NSD WWTP Levee	2	0.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
S2 Novato Creek Left Bank Excavation	7	0.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
S2 Concrete for Water Control Structures	2	0.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
S2 New Levee Surfacing	3	0.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
S2 Breaches & Tidal Connector Channel Exc	4	0.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
S2 Revegetation	2	0.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

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

3.2 S1 Site Preparation - 2026

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					0.2302	0.0000	0.2302	0.1113	0.0000	0.1113	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0402	0.4110	0.2395	6.3000e-004		0.0186	0.0186		0.0171	0.0171	0.0000	55.5609	55.5609	0.0180	0.0000	56.0101
Total	**0.0402**	**0.4110**	**0.2395**	**6.3000e-004**	**0.2302**	**0.0186**	**0.2488**	**0.1113**	**0.0171**	**0.1284**	**0.0000**	**55.5609**	**55.5609**	**0.0180**	**0.0000**	**56.0101**

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	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
Total	**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**

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

Mitigated 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					0.1036	0.0000	0.1036	0.0501	0.0000	0.0501	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0402	0.4110	0.2395	6.3000e-004		0.0186	0.0186		0.0171	0.0171	0.0000	55.5608	55.5608	0.0180	0.0000	56.0101
Total	**0.0402**	**0.4110**	**0.2395**	**6.3000e-004**	**0.1036**	**0.0186**	**0.1222**	**0.0501**	**0.0171**	**0.0672**	**0.0000**	**55.5608**	**55.5608**	**0.0180**	**0.0000**	**56.0101**

Mitigated 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	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
Total	**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**

3.3 S1 Novato Creek Channel Excavation - 2026

Unmitigated Construction On-Site

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

	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					0.0934	0.0000	0.0934	0.0101	0.0000	0.0101	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1284	1.1574	1.2257	3.1300e-003		0.0493	0.0493		0.0454	0.0454	0.0000	275.0823	275.0823	0.0890	0.0000	277.3064
Total	**0.1284**	**1.1574**	**1.2257**	**3.1300e-003**	**0.0934**	**0.0493**	**0.1427**	**0.0101**	**0.0454**	**0.0554**	**0.0000**	**275.0823**	**275.0823**	**0.0890**	**0.0000**	**277.3064**

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	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
Total	**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**

Mitigated Construction On-Site

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

	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					0.0420	0.0000	0.0420	4.5400e-003	0.0000	4.5400e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1284	1.1574	1.2257	3.1300e-003		0.0493	0.0493		0.0454	0.0454	0.0000	275.0819	275.0819	0.0890	0.0000	277.3061
Total	**0.1284**	**1.1574**	**1.2257**	**3.1300e-003**	**0.0420**	**0.0493**	**0.0913**	**4.5400e-003**	**0.0454**	**0.0499**	**0.0000**	**275.0819**	**275.0819**	**0.0890**	**0.0000**	**277.3061**

Mitigated 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	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
Total	**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**

3.4 S1 Interior Tidal Channel Excavation - 2026

Unmitigated Construction On-Site

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

	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					0.5375	0.0000	0.5375	0.2336	0.0000	0.2336	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1712	1.7530	1.2330	3.4700e-003		0.0722	0.0722		0.0665	0.0665	0.0000	304.5136	304.5136	0.0985	0.0000	306.9757
Total	**0.1712**	**1.7530**	**1.2330**	**3.4700e-003**	**0.5375**	**0.0722**	**0.6098**	**0.2336**	**0.0665**	**0.3001**	**0.0000**	**304.5136**	**304.5136**	**0.0985**	**0.0000**	**306.9757**

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	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
Total	**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**

Mitigated Construction On-Site

Date: 11/10/2022 9:36 AM

Deer Island - Marin County, Annual

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

	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					0.2419	0.0000	0.2419	0.1051	0.0000	0.1051	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1712	1.7530	1.2330	3.4700e-003		0.0722	0.0722		0.0665	0.0665	0.0000	304.5132	304.5132	0.0985	0.0000	306.9754
Total	**0.1712**	**1.7530**	**1.2330**	**3.4700e-003**	**0.2419**	**0.0722**	**0.3141**	**0.1051**	**0.0665**	**0.1716**	**0.0000**	**304.5132**	**304.5132**	**0.0985**	**0.0000**	**306.9754**

Mitigated 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	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
Total	**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**

3.5 S1 New NSD Force Main Levees and Berms - 2026

Unmitigated Construction On-Site

Date: 11/10/2022 9:36 AM

Deer Island - Marin County, Annual

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

	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					1.4415	0.0000	1.4415	0.7409	0.0000	0.7409	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1696	1.7134	1.0786	2.5000e-003		0.0766	0.0766		0.0704	0.0704	0.0000	219.9411	219.9411	0.0711	0.0000	221.7195
Total	**0.1696**	**1.7134**	**1.0786**	**2.5000e-003**	**1.4415**	**0.0766**	**1.5181**	**0.7409**	**0.0704**	**0.8113**	**0.0000**	**219.9411**	**219.9411**	**0.0711**	**0.0000**	**221.7195**

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	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
Total	**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**

Mitigated Construction On-Site

Date: 11/10/2022 9:36 AM

Deer Island - Marin County, Annual

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

	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					0.6487	0.0000	0.6487	0.3334	0.0000	0.3334	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1696	1.7134	1.0786	2.5000e-003		0.0766	0.0766		0.0704	0.0704	0.0000	219.9409	219.9409	0.0711	0.0000	221.7192
Total	**0.1696**	**1.7134**	**1.0786**	**2.5000e-003**	**0.6487**	**0.0766**	**0.7252**	**0.3334**	**0.0704**	**0.4038**	**0.0000**	**219.9409**	**219.9409**	**0.0711**	**0.0000**	**221.7192**

Mitigated 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	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
Total	**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**

3.6 S2 NSD Levee and Berms - 2027

Unmitigated Construction On-Site

Date: 11/10/2022 9:36 AM

Deer Island - Marin County, Annual

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

	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					1.8255	0.0000	1.8255	0.8914	0.0000	0.8914	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3045	3.1015	1.8191	5.5900e-003		0.1291	0.1291		0.1187	0.1187	0.0000	491.4176	491.4176	0.1589	0.0000	495.3909
Total	**0.3045**	**3.1015**	**1.8191**	**5.5900e-003**	**1.8255**	**0.1291**	**1.9546**	**0.8914**	**0.1187**	**1.0101**	**0.0000**	**491.4176**	**491.4176**	**0.1589**	**0.0000**	**495.3909**

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	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
Total	**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**

Mitigated Construction On-Site

Deer Island - Marin County, Annual

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

	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					0.8215	0.0000	0.8215	0.4011	0.0000	0.4011	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3045	3.1015	1.8191	5.5900e-003		0.1291	0.1291		0.1187	0.1187	0.0000	491.4170	491.4170	0.1589	0.0000	495.3903
Total	**0.3045**	**3.1015**	**1.8191**	**5.5900e-003**	**0.8215**	**0.1291**	**0.9505**	**0.4011**	**0.1187**	**0.5199**	**0.0000**	**491.4170**	**491.4170**	**0.1589**	**0.0000**	**495.3903**

Mitigated 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	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
Total	**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**

3.7 S2 New NSD WWTP Levee - 2027

Unmitigated Construction On-Site

Date: 11/10/2022 9:36 AM

Deer Island - Marin County, Annual

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

	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	2.6100e-003	0.0185	0.0382	6.0000e-005		9.8000e-004	9.8000e-004		9.0000e-004	9.0000e-004	0.0000	4.9714	4.9714	1.6100e-003	0.0000	5.0116
Total	**2.6100e-003**	**0.0185**	**0.0382**	**6.0000e-005**	**0.0000**	**9.8000e-004**	**9.8000e-004**	**0.0000**	**9.0000e-004**	**9.0000e-004**	**0.0000**	**4.9714**	**4.9714**	**1.6100e-003**	**0.0000**	**5.0116**

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	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
Total	**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**

Mitigated Construction On-Site

Deer Island - Marin County, Annual

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

	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	2.6100e-003	0.0185	0.0382	6.0000e-005		9.8000e-004	9.8000e-004		9.0000e-004	9.0000e-004	0.0000	4.9714	4.9714	1.6100e-003	0.0000	5.0116
Total	**2.6100e-003**	**0.0185**	**0.0382**	**6.0000e-005**	**0.0000**	**9.8000e-004**	**9.8000e-004**	**0.0000**	**9.0000e-004**	**9.0000e-004**	**0.0000**	**4.9714**	**4.9714**	**1.6100e-003**	**0.0000**	**5.0116**

Mitigated 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	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
Total	**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**

3.8 S2 Novato Creek Left Bank Excavation - 2027

Unmitigated Construction On-Site

Date: 11/10/2022 9:36 AM

Deer Island - Marin County, Annual

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

	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					0.0467	0.0000	0.0467	5.0400e-003	0.0000	5.0400e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0459	0.4606	0.3931	1.0400e-003		0.0186	0.0186		0.0171	0.0171	0.0000	91.6076	91.6076	0.0296	0.0000	92.3483
Total	**0.0459**	**0.4606**	**0.3931**	**1.0400e-003**	**0.0467**	**0.0186**	**0.0652**	**5.0400e-003**	**0.0171**	**0.0221**	**0.0000**	**91.6076**	**91.6076**	**0.0296**	**0.0000**	**92.3483**

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	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
Total	**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**

Mitigated Construction On-Site

Deer Island - Marin County, Annual

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

	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					0.0210	0.0000	0.0210	2.2700e-003	0.0000	2.2700e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0459	0.4606	0.3931	1.0400e-003		0.0186	0.0186		0.0171	0.0171	0.0000	91.6075	91.6075	0.0296	0.0000	92.3482
Total	**0.0459**	**0.4606**	**0.3931**	**1.0400e-003**	**0.0210**	**0.0186**	**0.0396**	**2.2700e-003**	**0.0171**	**0.0193**	**0.0000**	**91.6075**	**91.6075**	**0.0296**	**0.0000**	**92.3482**

Mitigated 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	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
Total	**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**

3.9 S2 Concrete for Water Control Structures - 2027

Unmitigated Construction On-Site

Date: 11/10/2022 9:36 AM

Deer Island - Marin County, Annual

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

	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	0.0152	0.1162	0.0948	3.7000e-004		4.5600e-003	4.5600e-003		4.2000e-003	4.2000e-003	0.0000	32.1063	32.1063	0.0104	0.0000	32.3659
Total	**0.0152**	**0.1162**	**0.0948**	**3.7000e-004**		**4.5600e-003**	**4.5600e-003**		**4.2000e-003**	**4.2000e-003**	**0.0000**	**32.1063**	**32.1063**	**0.0104**	**0.0000**	**32.3659**

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	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
Total	**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**

Mitigated Construction On-Site

Deer Island - Marin County, Annual

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

	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	0.0152	0.1162	0.0948	3.7000e-004		4.5600e-003	4.5600e-003		4.2000e-003	4.2000e-003	0.0000	32.1063	32.1063	0.0104	0.0000	32.3659
Total	**0.0152**	**0.1162**	**0.0948**	**3.7000e-004**		**4.5600e-003**	**4.5600e-003**		**4.2000e-003**	**4.2000e-003**	**0.0000**	**32.1063**	**32.1063**	**0.0104**	**0.0000**	**32.3659**

Mitigated 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	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
Total	**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**

3.10 S2 New Levee Surfacing - 2027

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

Deer Island - Marin County, Annual

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

Category	tons/yr										MT/yr					
Fugitive Dust					0.0721	0.0000	0.0721	0.0370	0.0000	0.0370	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.7200e-003	0.0968	0.0597	1.4000e-004		4.3200e-003	4.3200e-003		3.9900e-003	3.9900e-003	0.0000	11.8535	11.8535	3.7000e-003	0.0000	11.9461
Total	**9.7200e-003**	**0.0968**	**0.0597**	**1.4000e-004**	**0.0721**	**4.3200e-003**	**0.0764**	**0.0370**	**3.9900e-003**	**0.0410**	**0.0000**	**11.8535**	**11.8535**	**3.7000e-003**	**0.0000**	**11.9461**

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	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
Total	**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**

Mitigated 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

Deer Island - Marin County, Annual

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

Category	tons/yr										MT/yr					
Fugitive Dust					0.0324	0.0000	0.0324	0.0167	0.0000	0.0167	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.7200e-003	0.0968	0.0597	1.4000e-004		4.3200e-003	4.3200e-003		3.9900e-003	3.9900e-003	0.0000	11.8535	11.8535	3.7000e-003	0.0000	11.9461
Total	**9.7200e-003**	**0.0968**	**0.0597**	**1.4000e-004**	**0.0324**	**4.3200e-003**	**0.0368**	**0.0167**	**3.9900e-003**	**0.0207**	**0.0000**	**11.8535**	**11.8535**	**3.7000e-003**	**0.0000**	**11.9461**

Mitigated 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	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
Total	**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**

3.11 S2 Breaches & Tidal Connector Channel Exc - 2027

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

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Deer Island - Marin County, Annual

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

Category	tons/yr										MT/yr					
Fugitive Dust					0.0175	0.0000	0.0175	1.8900e-003	0.0000	1.8900e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0122	0.1233	0.0942	2.7000e-004		4.9500e-003	4.9500e-003		4.5500e-003	4.5500e-003	0.0000	24.0850	24.0850	7.7900e-003	0.0000	24.2797
Total	**0.0122**	**0.1233**	**0.0942**	**2.7000e-004**	**0.0175**	**4.9500e-003**	**0.0225**	**1.8900e-003**	**4.5500e-003**	**6.4400e-003**	**0.0000**	**24.0850**	**24.0850**	**7.7900e-003**	**0.0000**	**24.2797**

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	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
Total	**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**

Mitigated 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

Deer Island - Marin County, Annual

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

Category	tons/yr										MT/yr					
Fugitive Dust					7.8700e-003	0.0000	7.8700e-003	8.5000e-004	0.0000	8.5000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0122	0.1233	0.0942	2.7000e-004		4.9500e-003	4.9500e-003		4.5500e-003	4.5500e-003	0.0000	24.0850	24.0850	7.7900e-003	0.0000	24.2797
Total	**0.0122**	**0.1233**	**0.0942**	**2.7000e-004**	**7.8700e-003**	**4.9500e-003**	**0.0128**	**8.5000e-004**	**4.5500e-003**	**5.4000e-003**	**0.0000**	**24.0850**	**24.0850**	**7.7900e-003**	**0.0000**	**24.2797**

Mitigated 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	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
Total	**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**

3.12 S2 Revegetation - 2027

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

Deer Island - Marin County, Annual

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

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	4.7700e-003	0.0489	0.0478	1.3000e-004		1.8500e-003	1.8500e-003		1.7000e-003	1.7000e-003	0.0000	11.2510	11.2510	3.6400e-003	0.0000	11.3419
Total	**4.7700e-003**	**0.0489**	**0.0478**	**1.3000e-004**	**0.0000**	**1.8500e-003**	**1.8500e-003**	**0.0000**	**1.7000e-003**	**1.7000e-003**	**0.0000**	**11.2510**	**11.2510**	**3.6400e-003**	**0.0000**	**11.3419**

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	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
Total	**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**

Mitigated 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

Deer Island - Marin County, Annual

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

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	4.7700e-003	0.0489	0.0478	1.3000e-004		1.8500e-003	1.8500e-003		1.7000e-003	1.7000e-003	0.0000	11.2510	11.2510	3.6400e-003	0.0000	11.3419
Total	**4.7700e-003**	**0.0489**	**0.0478**	**1.3000e-004**	**0.0000**	**1.8500e-003**	**1.8500e-003**	**0.0000**	**1.7000e-003**	**1.7000e-003**	**0.0000**	**11.2510**	**11.2510**	**3.6400e-003**	**0.0000**	**11.3419**

Mitigated 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	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
Total	**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**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Deer Island - Marin County, Annual

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

	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					
Mitigated	0.1829	0.1657	1.6065	3.1900e-003	0.3751	2.2800e-003	0.3773	0.1001	2.1200e-003	0.1023	0.0000	294.1738	294.1738	0.0206	0.0136	298.7410
Unmitigated	0.1829	0.1657	1.6065	3.1900e-003	0.3751	2.2800e-003	0.3773	0.1001	2.1200e-003	0.1023	0.0000	294.1738	294.1738	0.0206	0.0136	298.7410

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Golf Course	489.94	489.94	489.94	1,022,783	1,022,783
Total	489.94	489.94	489.94	1,022,783	1,022,783

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Golf Course	14.70	6.60	6.60	33.00	48.00	19.00	52	39	9

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Golf Course	0.544281	0.061644	0.199793	0.122945	0.023341	0.005632	0.006920	0.003727	0.000656	0.000390	0.027229	0.000725	0.002716

5.0 Energy Detail

Historical Energy Use: N

Deer Island - Marin County, Annual

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

5.1 Mitigation Measures Energy

	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					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	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
NaturalGas Unmitigated	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

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	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
Land Use	kBTU/yr	tons/yr										MT/yr					
Golf Course	0	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
Total		**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**

Deer Island - Marin County, Annual

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

Mitigated

	NaturalGas Use	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
Land Use	kBTU/yr	tons/yr										MT/yr					
Golf Course	0	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
Total		**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**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	t o n	MT/yr		
Golf Course	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

Deer Island - Marin County, Annual

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

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	t o n	MT/yr		
Golf Course	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	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					
Mitigated	0.0538	1.0000e-005	1.2000e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.3400e-003	2.3400e-003	1.0000e-005	0.0000	2.4900e-003
Unmitigated	0.0538	1.0000e-005	1.2000e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.3400e-003	2.3400e-003	1.0000e-005	0.0000	2.4900e-003

6.2 Area by SubCategory

Unmitigated

	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

Deer Island - Marin County, Annual

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

SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0537					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.1000e-004	1.0000e-005	1.2000e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.3400e-003	2.3400e-003	1.0000e-005	0.0000	2.4900e-003
Total	**0.0538**	**1.0000e-005**	**1.2000e-003**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.3400e-003**	**2.3400e-003**	**1.0000e-005**	**0.0000**	**2.4900e-003**

Mitigated

	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
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0537					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.1000e-004	1.0000e-005	1.2000e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.3400e-003	2.3400e-003	1.0000e-005	0.0000	2.4900e-003
Total	**0.0538**	**1.0000e-005**	**1.2000e-003**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.3400e-003**	**2.3400e-003**	**1.0000e-005**	**0.0000**	**2.4900e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

Deer Island - Marin County, Annual

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

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	50.5452	8.1800e-003	9.9000e-004	51.0450
Unmitigated	50.5452	8.1800e-003	9.9000e-004	51.0450

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Golf Course	0 / 156.084	50.5452	8.1800e-003	9.9000e-004	51.0450
Total		**50.5452**	**8.1800e-003**	**9.9000e-004**	**51.0450**

Mitigated

Deer Island - Marin County, Annual

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

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Golf Course	0 / 156.084	50.5452	8.1800e-003	9.9000e-004	51.0450
Total		**50.5452**	**8.1800e-003**	**9.9000e-004**	**51.0450**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	24.7304	1.4615	0.0000	61.2685
Unmitigated	24.7304	1.4615	0.0000	61.2685

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e

Deer Island - Marin County, Annual

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

Land Use	tons	MT/yr			
Golf Course	121.83	24.7304	1.4615	0.0000	61.2685
Total		**24.7304**	**1.4615**	**0.0000**	**61.2685**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Golf Course	121.83	24.7304	1.4615	0.0000	61.2685
Total		**24.7304**	**1.4615**	**0.0000**	**61.2685**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Deer Island - Marin County, Annual

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

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

A-2 EMFAC Model Run

Source: EMFAC2017 (v1.0.3) Emission Rates
Region Type: County
Region: Marin
Calendar Year: 2024, 2025, 2026, 2027
Season: Annual
Vehicle Classification: EMFAC2011 Categories
Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HOTSOAK and RUNLOSS, g/vehicle/day for IDLEX, RESTLOSS and DIURN

2024

Region	Calendar Year	Vehicle Ca	Model Yea	Speed	Fuel	Population	VMT	Trips	NOx_RUNEX	NOx_IDLEX	NOx_STREX	PM2.5_RUNEX	PM2.5_IDLEX
MARIN	2024	LDA	Aggregate	Aggregate	Gasoline	133489	4388991	627482	0.03465125	0	0.182810587	0.001268136	0
MARIN	2024	LDA	Aggregate	Aggregate	Diesel	2251	69765	10359	0.08627174	0	0	0.007742785	0
MARIN	2024	LDT1	Aggregate	Aggregate	Gasoline	15815	498633	72444	0.07038414	0	0.242566427	0.001522031	0
MARIN	2024	LDT1	Aggregate	Aggregate	Diesel	9	106	28	1.02232215	0	0	0.145797698	0
MARIN	2024	LDT2	Aggregate	Aggregate	Gasoline	51368	1658844	238447	0.05733536	0	0.262678607	0.00125577	0
MARIN	2024	LDT2	Aggregate	Aggregate	Diesel	588	20063	2793	0.03684672	0	0	0.004582918	0
MARIN	2024	LHD1	Aggregate	Aggregate	Gasoline	3403	117243	50692	0.22197976	0.036802721	0.50204889	0.002247038	0
MARIN	2024	LHD1	Aggregate	Aggregate	Diesel	2819	103050	35457	1.59596813	1.971429908	0	0.021658797	0.02671185
MARIN	2024	LHD2	Aggregate	Aggregate	Gasoline	471	16450	7020	0.20180143	0.036216828	0.500471739	0.001984448	0
MARIN	2024	LHD2	Aggregate	Aggregate	Diesel	940	35625	11818	1.01016327	1.854478507	0	0.019808771	0.02675701
MARIN	2024	MCY	Aggregate	Aggregate	Gasoline	7171	51251	14342	1.18649975	0	0.275575339	0.001982496	0
MARIN	2024	MDV	Aggregate	Aggregate	Gasoline	30340	952721	140225	0.06857116	0	0.299513998	0.001286511	0
MARIN	2024	MDV	Aggregate	Aggregate	Diesel	1198	39566	5666	0.04028044	0	0	0.004319288	0
MARIN	2024	T6 instate	Aggregate	Aggregate	Diesel	22	1452	101	2.41963852	2.985849949	2.608719047	0.011908568	0.00104361

2024 **Running…Emissions** grams/mile

County	Calendar Year	Vehicle Category	Fuel	ROG	NOx	Ex PM_{10}	Ex $PM_{2.5}$	Total PM_{10}	Total $PM_{2.5}$	CO	CO_2	CH_4	N_2O
MARIN	2024	LDA	Gasoline	0.008	0.035	0.001	0.001	0.046	0.019	249.381	249.381	0.002	0.004
MARIN	2024	LDA	Diesel	0.015	0.086	0.008	0.008	0.053	0.025	211.335	211.335	0.001	0.033
MARIN	2024	LDT1	Gasoline	0.015	0.070	0.002	0.002	0.046	0.019	294.438	294.438	0.004	0.006
MARIN	2024	LDT1	Diesel	0.198	1.022	0.152	0.146	0.197	0.164	403.182	403.182	0.009	0.063
MARIN	2024	LDT2	Gasoline	0.011	0.057	0.001	0.001	0.046	0.019	314.726	314.726	0.003	0.005
MARIN	2024	LDT2	Diesel	0.014	0.037	0.005	0.005	0.050	0.022	292.745	292.745	0.001	0.046
MARIN	2024	LHD1	Gasoline	0.052	0.222	0.002	0.002	0.087	0.037	986.647	986.647	0.011	0.013
MARIN	2024	LHD1	Diesel	0.160	1.596	0.023	0.022	0.111	0.057	537.518	537.518	0.007	0.084
MARIN	2024	LHD2	Gasoline	0.032	0.202	0.002	0.002	0.099	0.042	1124.039	1124.039	0.007	0.013
MARIN	2024	LHD2	Diesel	0.143	1.010	0.021	0.020	0.122	0.061	595.824	595.824	0.007	0.094
MARIN	2024	MCY	Gasoline	2.336	1.186	0.002	0.002	0.018	0.008	218.014	218.014	0.343	0.068
MARIN	2024	MDV	Gasoline	0.014	0.069	0.001	0.001	0.046	0.019	379.175	379.175	0.003	0.006
MARIN	2024	MDV	Diesel	0.011	0.040	0.005	0.004	0.049	0.022	380.299	380.299	0.001	0.060
MARIN	2024	T6 instate	Diesel	0.026	2.420	0.012	0.012	0.155	0.071	1169.790	1169.790	0.001	0.184

2025

Region	Calendar Year	Vehicle Ca	Model Yea	Speed	Fuel	Population	VMT	Trips	NOx_RUNEX	NOx_IDLEX	NOx_STREX	PM2.5_RUNEX	PM2.5_IDLEX
MARIN	2025	LDA	Aggregate	Aggregate	Gasoline	135373	4400754	636447	0.03130312	0	0.171826011	0.001221896	0
MARIN	2025	LDA	Aggregate	Aggregate	Diesel	2224	67993	10234	0.07300617	0	0	0.006761409	0
MARIN	2025	LDT1	Aggregate	Aggregate	Gasoline	16011	499665	73394	0.06145557	0	0.225795036	0.001437293	0
MARIN	2025	LDT1	Aggregate	Aggregate	Diesel	8	100	26	0.92843261	0	0	0.132713378	0
MARIN	2025	LDT2	Aggregate	Aggregate	Gasoline	51713	1646055	239776	0.05138825	0	0.245222417	0.001225129	0
MARIN	2025	LDT2	Aggregate	Aggregate	Diesel	598	19863	2826	0.03515349	0	0	0.004493142	0
MARIN	2025	LHD1	Aggregate	Aggregate	Gasoline	3384	115695	50412	0.20055116	0.035828802	0.484329151	0.002222582	0
MARIN	2025	LHD1	Aggregate	Aggregate	Diesel	2865	103470	36040	1.41248777	1.882723935	0	0.020128229	0.02658503
MARIN	2025	LHD2	Aggregate	Aggregate	Gasoline	474	16385	7057	0.17979808	0.035221298	0.482768843	0.001972138	0
MARIN	2025	LHD2	Aggregate	Aggregate	Diesel	976	36347	12281	0.89526766	1.765055623	0	0.019329225	0.02676338
MARIN	2025	MCY	Aggregate	Aggregate	Gasoline	7252	51070	14504	1.1835013	0	0.275317507	0.002007528	0
MARIN	2025	MDV	Aggregate	Aggregate	Gasoline	30670	951549	141722	0.0598895	0	0.274228438	0.001241172	0
MARIN	2025	MDV	Aggregate	Aggregate	Diesel	1221	39342	5749	0.03689399	0	0	0.004095698	0
MARIN	2025	T6 instate	Aggregate	Aggregate	Diesel	24	1540	109	2.41925827	2.969119062	2.61456304	0.011671029	0.00097863

2025

County	Calendar Year	Vehicle Category	Fuel	ROG	NOx	Ex PM_{10}	Ex $PM_{2.5}$	Total PM_{10}	Total $PM_{2.5}$	CO	CO_2	CH_4	N_2O
MARIN	2025	LDA	Gasoline	0.007	0.031	0.001	0.001	0.046	0.019	242.051	242.051	0.002	0.004
MARIN	2025	LDA	Diesel	0.014	0.073	0.007	0.007	0.052	0.025	205.777	205.777	0.001	0.032
MARIN	2025	LDT1	Gasoline	0.013	0.061	0.002	0.001	0.046	0.019	286.462	286.462	0.003	0.005
MARIN	2025	LDT1	Diesel	0.181	0.928	0.139	0.133	0.183	0.150	394.766	394.766	0.008	0.062
MARIN	2025	LDT2	Gasoline	0.010	0.051	0.001	0.001	0.046	0.019	304.337	304.337	0.003	0.005
MARIN	2025	LDT2	Diesel	0.014	0.035	0.005	0.004	0.049	0.022	285.880	285.880	0.001	0.045
MARIN	2025	LHD1	Gasoline	0.046	0.201	0.002	0.002	0.087	0.037	973.204	973.204	0.010	0.012
MARIN	2025	LHD1	Diesel	0.155	1.412	0.021	0.020	0.109	0.056	528.935	528.935	0.007	0.083
MARIN	2025	LHD2	Gasoline	0.028	0.180	0.002	0.002	0.099	0.042	1108.273	1108.273	0.006	0.012
MARIN	2025	LHD2	Diesel	0.141	0.895	0.020	0.019	0.121	0.061	586.461	586.461	0.007	0.092
MARIN	2025	MCY	Gasoline	2.317	1.184	0.002	0.002	0.018	0.008	217.838	217.838	0.341	0.068
MARIN	2025	MDV	Gasoline	0.012	0.060	0.001	0.001	0.046	0.019	366.504	366.504	0.003	0.005
MARIN	2025	MDV	Diesel	0.011	0.037	0.004	0.004	0.049	0.022	370.597	370.597	0.000	0.058
MARIN	2025	T6 instate	Diesel	0.025	2.419	0.012	0.012	0.155	0.071	1156.792	1156.792	0.001	0.182

2026

Region	Calendar Year	Vehicle Ca	Model Yea	Speed	Fuel	Population	VMT	Trips	NOx_RUNEX	NOx_IDLEX	NOx_STREX	PM2.5_RUNEX	PM2.5_IDLEX
MARIN	2026	LDA	Aggregate	Aggregate	Gasoline	137264	4404067	645321	0.0286953	0	0.162545638	0.00117137	0
MARIN	2026	LDA	Aggregate	Aggregate	Diesel	2191	66195	10093	0.06113738	0	0	0.005789043	0
MARIN	2026	LDT1	Aggregate	Aggregate	Gasoline	16207	499807	74329	0.05417191	0	0.211310593	0.001356663	0
MARIN	2026	LDT1	Aggregate	Aggregate	Diesel	7	92	23	0.80784893	0	0	0.11535874	0
MARIN	2026	LDT2	Aggregate	Aggregate	Gasoline	52049	1631740	241078	0.0464491	0	0.229892433	0.001187207	0
MARIN	2026	LDT2	Aggregate	Aggregate	Diesel	605	19576	2846	0.03379526	0	0	0.004422742	0
MARIN	2026	LHD1	Aggregate	Aggregate	Gasoline	3373	114485	50251	0.1822708	0.034869731	0.466240626	0.002208443	0
MARIN	2026	LHD1	Aggregate	Aggregate	Diesel	2909	103900	36593	1.24574952	1.797473584	0	0.018720125	0.0265094
MARIN	2026	LHD2	Aggregate	Aggregate	Gasoline	476	16333	7087	0.15819815	0.034258511	0.465924837	0.001956004	0
MARIN	2026	LHD2	Aggregate	Aggregate	Diesel	1012	37022	12724	0.79370592	1.682181192	0	0.018920571	0.02677864
MARIN	2026	MCY	Aggregate	Aggregate	Gasoline	7315	50937	14631	1.18076727	0	0.274890008	0.002024707	0
MARIN	2026	MDV	Aggregate	Aggregate	Gasoline	31007	949200	143228	0.05300231	0	0.252417608	0.001194011	0
MARIN	2026	MDV	Aggregate	Aggregate	Diesel	1240	39006	5813	0.03329218	0	0	0.00379229	0
MARIN	2026	T6 instate	Aggregate	Aggregate	Diesel	26	1599	116	2.42487291	2.954503482	2.620033091	0.011486341	0.00092277

2026

County	Calendar Year	Vehicle Category	Fuel	ROG	NOx	Ex PM_{10}	Ex $PM_{2.5}$	Total PM_{10}	Total $PM_{2.5}$	CO	CO_2	CH_4	N_2O
MARIN	2026	LDA	Gasoline	0.006	0.029	0.001	0.001	0.046	0.019	235.444	235.444	0.002	0.004
MARIN	2026	LDA	Diesel	0.013	0.061	0.006	0.006	0.051	0.024	200.371	200.371	0.001	0.031
MARIN	2026	LDT1	Gasoline	0.011	0.054	0.001	0.001	0.046	0.019	279.184	279.184	0.003	0.005
MARIN	2026	LDT1	Diesel	0.159	0.808	0.121	0.115	0.165	0.133	384.597	384.597	0.007	0.060
MARIN	2026	LDT2	Gasoline	0.009	0.046	0.001	0.001	0.046	0.019	294.754	294.754	0.002	0.005
MARIN	2026	LDT2	Diesel	0.014	0.034	0.005	0.004	0.049	0.022	279.174	279.174	0.001	0.044
MARIN	2026	LHD1	Gasoline	0.042	0.182	0.002	0.002	0.087	0.037	958.981	958.981	0.009	0.011
MARIN	2026	LHD1	Diesel	0.151	1.246	0.020	0.019	0.108	0.054	520.086	520.086	0.007	0.082
MARIN	2026	LHD2	Gasoline	0.023	0.158	0.002	0.002	0.099	0.042	1091.543	1091.543	0.005	0.011
MARIN	2026	LHD2	Diesel	0.139	0.794	0.020	0.019	0.121	0.060	576.914	576.914	0.006	0.091
MARIN	2026	MCY	Gasoline	2.300	1.181	0.002	0.002	0.018	0.008	217.679	217.679	0.339	0.067
MARIN	2026	MDV	Gasoline	0.010	0.053	0.001	0.001	0.046	0.019	354.901	354.901	0.003	0.005
MARIN	2026	MDV	Diesel	0.010	0.033	0.004	0.004	0.049	0.022	361.278	361.278	0.000	0.057
MARIN	2026	T6 instate	Diesel	0.023	2.425	0.012	0.011	0.154	0.070	1146.959	1146.959	0.001	0.180

2027

Region	Calendar Year	Vehicle Ca	Model Yea	Speed	Fuel	Population	VMT	Trips	NOx_RUNEX	NOx_IDLEX	NOx_STREX	PM2.5_RUNEX	PM2.5_IDLEX
MARIN	2027	LDA	Aggregate	Aggregate	Gasoline	139112.0	4418191.7	653865.0	0.0265994	0	0.154839314	0.001110944	0
MARIN	2027	LDA	Aggregate	Aggregate	Diesel	2153.4	64639.1	9938.2	0.05038295	0	0	0.004827164	0
MARIN	2027	LDT1	Aggregate	Aggregate	Gasoline	16398.8	501212.9	75235.2	0.048029	0	0.198898553	0.001273127	0
MARIN	2027	LDT1	Aggregate	Aggregate	Diesel	4.4	73.6	15.3	0.49061562	0	0	0.068309085	0
MARIN	2027	LDT2	Aggregate	Aggregate	Gasoline	52360.7	1622400.7	242273.5	0.04217604	0	0.216259905	0.00113851	0
MARIN	2027	LDT2	Aggregate	Aggregate	Diesel	607.5	19290.4	2850.1	0.03166213	0	0	0.004205552	0
MARIN	2027	LHD1	Aggregate	Aggregate	Gasoline	3365.8	113570.9	50144.8	0.16420309	0.033932561	0.448941499	0.002191362	0
MARIN	2027	LHD1	Aggregate	Aggregate	Diesel	2952.1	104375.9	37133.1	1.09651671	1.716102332	0	0.017438502	0.02646105
MARIN	2027	LHD2	Aggregate	Aggregate	Gasoline	478.5	16311.0	7128.5	0.14062797	0.033337772	0.448846926	0.001951634	0
MARIN	2027	LHD2	Aggregate	Aggregate	Diesel	1046.0	37670.8	13157.0	0.70650462	1.606145888	0	0.018588386	0.02679553
MARIN	2027	MCY	Aggregate	Aggregate	Gasoline	7370.1	50838.4	14740.2	1.17839959	0	0.274700335	0.002037447	0
MARIN	2027	MDV	Aggregate	Aggregate	Gasoline	31345.7	949779.9	144733.6	0.04726716	0	0.233793512	0.00113908	0
MARIN	2027	MDV	Aggregate	Aggregate	Diesel	1253.8	38720.9	5859.0	0.02962824	0	0	0.003439266	0
MARIN	2027	T6 instate	Aggregate	Aggregate	Diesel	27.0	1658.8	122.2	2.43430544	2.941043051	2.625152225	0.011352366	0.00087932

2027

County	Calendar Year	Vehicle Category	Fuel	ROG	NOx	Ex PM_{10}	Ex $PM_{2.5}$	Total PM_{10}	Total $PM_{2.5}$	CO	CO_2	CH_4	N_2O
MARIN	2027	LDA	Gasoline	0.005	0.027	0.001	0.001	0.046	0.019	229.518	229.518	0.001	0.003
MARIN	2027	LDA	Diesel	0.011	0.050	0.005	0.005	0.050	0.023	195.150	195.150	0.001	0.031
MARIN	2027	LDT1	Gasoline	0.010	0.048	0.001	0.001	0.046	0.019	272.493	272.493	0.002	0.005
MARIN	2027	LDT1	Diesel	0.102	0.491	0.071	0.068	0.116	0.086	361.641	361.641	0.005	0.057
MARIN	2027	LDT2	Gasoline	0.008	0.042	0.001	0.001	0.046	0.019	285.859	285.859	0.002	0.004
MARIN	2027	LDT2	Diesel	0.014	0.032	0.004	0.004	0.049	0.022	272.456	272.456	0.001	0.043
MARIN	2027	LHD1	Gasoline	0.037	0.164	0.002	0.002	0.087	0.037	944.042	944.042	0.008	0.010
MARIN	2027	LHD1	Diesel	0.148	1.097	0.018	0.017	0.107	0.053	511.080	511.080	0.007	0.080
MARIN	2027	LHD2	Gasoline	0.020	0.141	0.002	0.002	0.099	0.042	1074.283	1074.283	0.005	0.010
MARIN	2027	LHD2	Diesel	0.137	0.707	0.019	0.019	0.121	0.060	567.309	567.309	0.006	0.089
MARIN	2027	MCY	Gasoline	2.285	1.178	0.002	0.002	0.018	0.008	217.537	217.537	0.338	0.067
MARIN	2027	MDV	Gasoline	0.009	0.047	0.001	0.001	0.046	0.019	344.251	344.251	0.002	0.005
MARIN	2027	MDV	Diesel	0.010	0.030	0.004	0.003	0.048	0.021	352.304	352.304	0.000	0.055
MARIN	2027	T6 instate	Diesel	0.022	2.434	0.012	0.011	0.154	0.070	1137.192	1137.192	0.001	0.179

PM2.5_STREX	PM2.5_PMTW	PM2.5_PMBW	PM10_RUNEX	PM10_IDLEX	PM10_STREX	PM10_PMTW	PM10_PMBW	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CH4_RUNEX	CH4_IDLEX	CH4_STREX	N2O_RUNEX	N2O_IDLEX	N2O_STREX	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HOTSOAK	ROG_RUNLOSS	ROG_RESTLOSS	ROG_DIURN	TOG_RUNLOSS	TOG_IDLEX	TOG_STREX	TOG_HOTSOAK	TOG_RUNLOSS	TOG_RESTLOSS	TOG_DIURN	CO_RUNEX	CO_IDLEX	CO_STREX	SOx_RUNEX	SOx_IDLEX	SOx_STREX
0.001685303	0.002000001	0.015750005	0.001379213	0	0.00183292	0.008000002	0.036750011	249.380513	0	52.64554	0.002044	0	0.049164	0.00405543	0	0.024927	0.007873211	0	0.222074	0.099515	0.219566403	0.173023	0.17852	0.011489	0	0.243143	0.099515	0.219566	0.173023	0.17852	0.5434467	0	2.267239	0.00246782	0	0.000521
0	0.002000001	0.015750005	0.00809288	0	0	0.008000002	0.036750011	211.334637	0	0	0.000718	0	0	0.03321886	0	0	0.01546702	0	0	0	0	0	0	0.017608	0	0	0	0	0	0	0.2376859	0	0	0.00199787	0	0
0.002064874	0.002000001	0.015750005	0.001655332	0	0.002245698	0.008000002	0.036750011	294.438418	0	62.59035	0.003627	0	0.065147	0.00599581	0	0.027871	0.015498459	0	0.32265	0.176148	0.658572971	0.330937	0.364564	0.022613	0	0.353261	0.176148	0.658573	0.330937	0.364564	0.807197	0	2.415439	0.00291371	0	0.0006194
0	0.002000001	0.015750005	0.152390023	0	0	0.008000002	0.036750011	403.181508	0	0	0.009195	0	0	0.06337452	0	0	0.197961903	0	0	0	0	0	0	0.225366	0	0	0	0	0	0	1.2625344	0	0	0.00381152	0	0
0.00162131	0.002000001	0.015750005	0.001365761	0	0.001763314	0.008000002	0.036750011	314.726045	0	67.70123	0.002825	0	0.065289	0.00525895	0	0.030688	0.011130846	0	0.303093	0.123961	0.451035288	0.276015	0.261703	0.016242	0	0.331849	0.123961	0.451035	0.276015	0.261703	0.6669255	0	2.822711	0.00311447	0	0.00067
0	0.002000001	0.015750005	0.004790138	0	0	0.008000002	0.036750011	292.745435	0	0	0.000666	0	0	0.04601551	0	0	0.014337196	0	0	0	0	0	0	0.016322	0	0	0	0	0	0	0.1449027	0	0	0.0027675	0	0
0.00402485	0.002000001	0.032760009	0.002443859	0	0.000437739	0.008000002	0.076440022	986.647316	119.4123	18.80704	0.010569	0.116958	0.023713	0.01326418	0.00305	0.039621	0.051841034	0.421458	0.120529	0.129572	0.974381758	0.025382	0.044782	0.075646	0.614991	0.131964	0.129572	0.974382	0.025382	0.044782	0.9786452	3.749967	1.775872	0.00976368	0.001182	0.0001861
0	0.003000001	0.032760009	0.022638111	0.02792	0	0.012000003	0.076440022	537.51753	131.9903	0	0.00742	0.005098	0	0.08449027	0.020747	0	0.159754823	0.10976	0	0	0	0	0	0.18187	0.124954	0	0	0	0	0	0.7048081	0.909745	0	0.00508147	0.001248	0
0.000316278	0.002000001	0.038220011	0.002158268	0	0.000343982	0.008000002	0.089180026	1124.03927	136.9864	21.24151	0.007171	0.116806	0.022302	0.01297648	0.002998	0.039359	0.032032172	0.415232	0.110967	0.106236	0.657980108	0.02088	0.035332	0.046741	0.605905	0.121495	0.106236	0.65798	0.02088	0.035332	0.5989714	3.761634	1.701988	0.01112328	0.001356	0.0002102
0	0.003000001	0.038220011	0.020704435	0.027967	0	0.012000003	0.089180026	595.824373	208.7904	0	0.006643	0.005098	0	0.09365529	0.032819	0	0.14301268	0.10976	0	0	0	0	0	0.16281	0.124954	0	0	0	0	0	0.6163499	0.909745	0	0.00563268	0.001974	0
0.003079016	0.001	0.005040001	0.002119632	0	0.003268441	0.004000001	0.011760003	218.01449	0	61.89949	0.342849	0	0.261141	0.06766288	0	0.015422	2.336082967	0	2.009476	0.754271	2.327594514	0.959384	1.573691	2.888591	0	2.186629	0.754271	2.327595	0.959384	1.573691	20.708497	0	9.131437	0.00215743	0	0.0006125
0.001718405	0.002000001	0.015750005	0.00139917	0	0.001868858	0.008000002	0.036750011	379.174728	0	81.74213	0.003332	0	0.073483	0.00599907	0	0.032056	0.013528774	0	0.356988	0.133271	0.453970306	0.308274	0.287519	0.019731	0	0.390856	0.133271	0.45397	0.308274	0.287519	0.7202841	0	3.097962	0.00375224	0	0.0008089
0	0.002000001	0.015750005	0.004514587	0	0	0.008000002	0.036750011	380.299324	0	0	0.000518	0	0	0.05977776	0	0	0.011152856	0	0	0	0	0	0	0.012697	0	0	0	0	0	0	0.2139797	0	0	0.0035952	0	0
0	0.003000001	0.055860016	0.012447021	0.001091	0	0.012000003	0.130340037	1169.79029	611.5026	0	0.001211	0.002312	0	0.18387474	0.09612	0	0.026069373	0.049771	0	0	0	0	0	0.029678	0.05666	0	0	0	0	0	0.2025497	2.065668	0	0.0110516	0.005777	0

2024 **Idling Emissions** grams/minute

County	Calendar Year	Vehicle Category	Fuel	ROG	NOx	Ex PM_{10}	Ex $PM_{2.5}$	Total PM_{10}	Total $PM_{2.5}$	CO	CO_2	CH_4	N_2O
MARIN	2024	LDA	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2024	LDA	Diesel	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2024	LDT1	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2024	LDT1	Diesel	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2024	LDT2	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2024	LDT2	Diesel	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2024	LHD1	Gasoline	3.750	0.037	0.000	0.000	NA	NA	3.750	119.412	0.117	0.003
MARIN	2024	LHD1	Diesel	0.910	1.971	0.028	0.027	NA	NA	0.910	131.990	0.005	0.021
MARIN	2024	LHD2	Gasoline	3.762	0.036	0.000	0.000	NA	NA	3.762	136.986	0.117	0.003
MARIN	2024	LHD2	Diesel	0.910	1.854	0.028	0.027	NA	NA	0.910	208.790	0.005	0.033
MARIN	2024	MCY	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2024	MDV	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2024	MDV	Diesel	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2024	T6 instate cons	Diesel	2.066	2.986	0.001	0.001	NA	NA	2.066	611.503	0.002	0.096

PM2.5_STREX	PM2.5_PMTW	PM2.5_PMBW	PM10_RUNEX	PM10_IDL	PM10_STREX	PM10_PMTW	PM10_PMBW	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CH4_RUNEX	CH4_IDLEX	CH4_STREX	N2O_RUNEX	N2O_IDLEX	N2O_STREX	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HOT	ROG_RUNLOSS	ROG_REST	ROG_DIUR	TOG_RUN	TOG_IDLEX	TOG_STRE	TOG_HOTS	TOG_RUN	TOG_REST	TOG_DIURN	CO_RUNEX	CO_IDLEX	CO_STREX	SOx_RUNEX	SOx_IDLEX	SOx_STREX
0.00162823	0.002000001	0.015750005	0.001328923	0	0.001770848	0.008000002	0.036750011	242.05134	0	51.08252	0.001815	0	0.045427	0.0038152	0	0.023878	0.006877066	0	0.202788	0.09395	0.212944415	0.163367	0.167371	0.010035	0	0.222027	0.09395	0.212944	0.163367	0.167371	0.5105673	0	2.180456	0.00239529	0	0.0005055
0	0.002000001	0.015750005	0.00706713	0	0	0.008000002	0.036750011	205.776803	0	0	0.000649	0	0	0.03234525	0	0	0.013980873	0	0	0	0	0	0	0.015916	0	0	0	0	0	0	0.2268154	0	0	0.00194533	0	0
0.001952771	0.002000001	0.015750005	0.001563187	0	0.002123817	0.008000002	0.036750011	286.461536	0	60.87409	0.003146	0	0.059583	0.0054663	0	0.026699	0.013270486	0	0.291115	0.163782	0.617611211	0.310817	0.337801	0.019364	0	0.318735	0.163782	0.617611	0.310817	0.337801	0.7326067	0	2.322403	0.00283477	0	0.0006024
0	0.002000001	0.015750005	0.138714088	0	0	0.008000002	0.036750011	394.765832	0	0	0.008395	0	0	0.06205169	0	0	0.180740237	0	0	0	0	0	0	0.205761	0	0	0	0	0	0	1.1536755	0	0	0.00373196	0	0
0.001591243	0.002000001	0.015750005	0.00133244	0	0.001730622	0.008000002	0.036750011	304.33668	0	65.60334	0.002567	0	0.061315	0.00488603	0	0.029293	0.009998449	0	0.282414	0.120295	0.443156131	0.273091	0.256533	0.01459	0	0.309208	0.120295	0.443156	0.273091	0.256533	0.6294656	0	2.7432	0.00301166	0	0.0006492
0	0.002000001	0.015750005	0.004696302	0	0	0.008000002	0.036750011	285.880037	0	0	0.000661	0	0	0.04493636	0	0	0.014223739	0	0	0	0	0	0	0.016193	0	0	0	0	0	0	0.1461727	0	0	0.00270259	0	0
0.000392501	0.002000001	0.032760009	0.002417261	0	0.00042688	0.008000002	0.076440022	973.203911	118.2199	18.62799	0.009541	0.114649	0.022373	0.01210913	0.003015	0.038675	0.046437809	0.410376	0.113457	0.125311	0.953309261	0.024758	0.043207	0.067762	0.598819	0.124221	0.125311	0.953309	0.024758	0.043207	0.8872488	3.752616	1.74413	0.00963064	0.00117	0.0001843
0	0.003000001	0.032760009	0.021038338	0.027787	0	0.012000003	0.076440022	528.935239	130.2598	0	0.00722	0.005098	0	0.08314125	0.020475	0	0.15545137	0.10976	0	0	0	0	0	0.176971	0.124954	0	0	0	0	0	0.687923	0.909745	0	0.00500034	0.001231	0
0.000310403	0.002000001	0.038220011	0.00214488	0	0.000337592	0.008000002	0.089180026	1108.2729	135.5252	20.99938	0.006358	0.114376	0.020958	0.01178433	0.002963	0.038421	0.028005296	0.403905	0.103655	0.101191	0.615421432	0.020263	0.033674	0.040865	0.589377	0.113489	0.101191	0.615421	0.020263	0.033674	0.5264125	3.76452	1.65477	0.01096726	0.001341	0.0002078
0	0.003000001	0.038220011	0.020203207	0.027974	0	0.012000003	0.089180026	586.460917	206.0367	0	0.006536	0.005098	0	0.09218349	0.032386	0	0.140726584	0.10976	0	0	0	0	0	0.160208	0.124954	0	0	0	0	0	0.6103555	0.909745	0	0.00554416	0.001948	0
0.003048773	0.001	0.005040001	0.002147484	0	0.003238941	0.004000001	0.011760003	217.838145	0	61.60291	0.341016	0	0.259819	0.06752615	0	0.015418	2.316874222	0	1.99802	0.74066	2.22988695	0.951133	1.568364	2.871799	0	2.174394	0.74066	2.229887	0.951133	1.568364	20.378951	0	9.161047	0.00215569	0	0.0006096
0.001659101	0.002000001	0.015750005	0.001349882	0	0.001804411	0.008000002	0.036750011	366.504143	0	79.09969	0.002955	0	0.067814	0.00545768	0	0.030297	0.01182949	0	0.325676	0.12838	0.44259645	0.304312	0.281687	0.017259	0	0.356574	0.12838	0.442596	0.304312	0.281687	0.6677362	0	2.963752	0.00362686	0	0.0007828
0	0.002000001	0.015750005	0.004280887	0	0	0.008000002	0.036750011	370.596929	0	0	0.000497	0	0	0.05825268	0	0	0.010706383	0	0	0	0	0	0	0.012189	0	0	0	0	0	0	0.2112141	0	0	0.00350347	0	0
0	0.003000001	0.055860016	0.012198741	0.001023	0	0.012000003	0.130340037	1156.79177	606.794	0	0.001148	0.002307	0	0.18183156	0.09538	0	0.024719649	0.04966	0	0	0	0	0	0.028141	0.056534	0	0	0	0	0	0.2032888	2.06865	0	0.0109288	0.005733	0

2025 **Idling Emissions** grams/minute

County	Calendar Year	Vehicle Category	Fuel	ROG	NOx	Ex PM_{10}	Ex $PM_{2.5}$	Total PM_{10}	Total $PM_{2.5}$	CO	CO_2	CH_4	N_2O
MARIN	2025	LDA	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2025	LDA	Diesel	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2025	LDT1	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2025	LDT1	Diesel	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2025	LDT2	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2025	LDT2	Diesel	3.753	0.036	0.000	0.000	NA	NA	3.753	118.220	0.115	0.003
MARIN	2025	LHD1	Gasoline	0.910	1.883	0.028	0.027	NA	NA	0.910	130.260	0.005	0.020
MARIN	2025	LHD1	Diesel	3.765	0.035	0.000	0.000	NA	NA	3.765	135.525	0.114	0.003
MARIN	2025	LHD2	Gasoline	0.910	1.765	0.028	0.027	NA	NA	0.910	206.037	0.005	0.032
MARIN	2025	LHD2	Diesel	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2025	MCY	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2025	MDV	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2025	MDV	Diesel	2.069	2.969	0.001	0.001	NA	NA	2.069	606.794	0.002	0.095
MARIN	2025	T6 instate cons	Diesel	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000

PM2.5_STREX	PM2.5_PMTW	PM2.5_PMBW	PM10_RUNEX	PM10_IDL	PM10_STREX	PM10_PMTW	PM10_PMBW	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CH4_RUNEX	CH4_IDLEX	CH4_STREX	N2O_RUNEX	N2O_IDLEX	N2O_STREX	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HOT	ROG_RUNLOSS	ROG_RESTL	ROG_DIURN	TOG_RUN	TOG_IDLEX	TOG_STREX	TOG_HOTST	TOG_RUN	TOG_REST	TOG_DIURN	CO_RUNEX	CO_IDLEX	CO_STREX	SOx_RUNEX	SOx_IDLEX	SOx_STREX
0.001570768	0.002000001	0.015750005	0.001273972	0	0.001708354	0.008000002	0.036750011	235.443926	0	49.64375	0.001629	0	0.042124	0.00362649	0	0.02297	0.006074922	0	0.186009	0.088969	0.207179511	0.154633	0.157447	0.008865	0	0.203656	0.088969	0.20718	0.154633	0.157447	0.4840866	0	2.100572	0.00232991	0	0.0004913
0	0.002000001	0.015750005	0.006050798	0	0	0.008000002	0.036750011	200.37074	0	0	0.000581	0	0	0.03149549	0	0	0.012518033	0	0	0	0	0	0	0.014251	0	0	0	0	0	0	0.2162199	0	0	0.00189422	0	0
0.001848367	0.002000001	0.015750005	0.001475495	0	0.002010268	0.008000002	0.036750011	279.183972	0	59.26707	0.002745	0	0.054641	0.00503308	0	0.025674	0.011419576	0	0.263306	0.152487	0.580845571	0.29169	0.313031	0.016663	0	0.288287	0.152487	0.580846	0.29169	0.313031	0.6703532	0	2.232143	0.00276275	0	0.0005865
0	0.002000001	0.015750005	0.12057475	0	0	0.008000002	0.036750011	384.596914	0	0	0.007369	0	0	0.06045328	0	0	0.158659912	0	0	0	0	0	0	0.180624	0	0	0	0	0	0	1.0327318	0	0	0.00363582	0	0
0.001553788	0.002000001	0.015750005	0.001291195	0	0.001689886	0.008000002	0.036750011	294.753786	0	63.62435	0.002344	0	0.057663	0.00457455	0	0.028041	0.009025735	0	0.263566	0.116599	0.434407319	0.269274	0.250948	0.01317	0	0.288572	0.116599	0.434407	0.269274	0.250948	0.5979131	0	2.669172	0.00291683	0	0.0006296
0	0.002000001	0.015750005	0.004622719	0	0	0.008000002	0.036750011	279.173653	0	0	0.000657	0	0	0.04388221	0	0	0.014134923	0	0	0	0	0	0	0.016092	0	0	0	0	0	0	0.1472128	0	0	0.00263919	0	0
0.000385677	0.002000001	0.032760009	0.002401883	0	0.000419459	0.008000002	0.076440022	958.980637	116.9331	18.43725	0.008728	0.112302	0.021121	0.01111767	0.002977	0.037705	0.042208868	0.39944	0.106836	0.121594	0.939465687	0.024247	0.041932	0.061591	0.582863	0.116972	0.121594	0.939466	0.024247	0.041932	0.815749	3.754679	1.717321	0.00948989	0.001157	0.0001825
0	0.003000001	0.032760009	0.019566566	0.027708	0	0.012000003	0.076440022	520.085844	128.4423	0	0.007037	0.005098	0	0.08175025	0.020189	0	0.151494486	0.10976	0	0	0	0	0	0.172466	0.124954	0	0	0	0	0	0.6728001	0.909745	0	0.00491668	0.001214	0
0.000303109	0.002000001	0.038220011	0.002127333	0	0.000329658	0.008000002	0.089180026	1091.54307	133.9407	20.74272	0.005437	0.112071	0.019717	0.01064957	0.002929	0.037561	0.023230177	0.392965	0.096841	0.095858	0.574934096	0.019476	0.031715	0.033897	0.573414	0.106029	0.095858	0.574934	0.019476	0.031715	0.4413818	3.767672	1.610245	0.0108017	0.001325	0.0002053
0	0.003000001	0.038220011	0.019776075	0.027989	0	0.012000003	0.089180026	576.91396	203.1835	0	0.006443	0.005098	0	0.09068284	0.031938	0	0.138723056	0.10976	0	0	0	0	0	0.157927	0.124954	0	0	0	0	0	0.6055171	0.909745	0	0.00545391	0.001921	0
0.002982715	0.001	0.005040001	0.002166918	0	0.003171879	0.004000001	0.011760003	217.679362	0	61.30627	0.339381	0	0.258455	0.06740392	0	0.015412	2.299672303	0	1.985297	0.721626	2.092083189	0.939947	1.558971	2.856662	0	2.16079	0.721626	2.092083	0.939947	1.558971	20.083156	0	9.192938	0.00215411	0	0.0006067
0.00160315	0.002000001	0.015750005	0.001298594	0	0.001743567	0.008000002	0.036750011	354.90094	0	76.63752	0.002648	0	0.062798	0.00501992	0	0.028756	0.010469512	0	0.298289	0.123789	0.431364215	0.300571	0.276666	0.015276	0	0.326589	0.123789	0.431364	0.300571	0.276666	0.6273848	0	2.850441	0.00351203	0	0.0007584
0	0.002000001	0.015750005	0.00396376	0	0	0.008000002	0.036750011	361.278208	0	0	0.000472	0	0	0.0567879	0	0	0.010167815	0	0	0	0	0	0	0.011575	0	0	0	0	0	0	0.2077626	0	0	0.00341538	0	0
0	0.003000001	0.055860016	0.012005703	0.000964	0	0.012000003	0.130340037	1146.95921	602.4448	0	0.001091	0.002302	0	0.18028602	0.094696	0	0.023498118	0.049565	0	0	0	0	0	0.026751	0.056426	0	0	0	0	0	0.2041996	2.071252	0	0.0108359	0.005692	0

2026 **Idling Emissions** grams/minute

County	Calendar Year	Vehicle Category	Fuel	ROG	NOx	Ex PM_{10}	Ex $PM_{2.5}$	Total PM_{10}	Total $PM_{2.5}$	CO	CO_2	CH_4	N_2O
MARIN	2026	LDA	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2026	LDA	Diesel	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2026	LDT1	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2026	LDT1	Diesel	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2026	LDT2	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2026	LDT2	Diesel	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2026	LHD1	Gasoline	3.755	0.035	0.000	0.000	NA	NA	3.755	116.933	0.112	0.003
MARIN	2026	LHD1	Diesel	0.910	1.797	0.028	0.027	NA	NA	0.910	128.442	0.005	0.020
MARIN	2026	LHD2	Gasoline	3.768	0.034	0.000	0.000	NA	NA	3.768	133.941	0.112	0.003
MARIN	2026	LHD2	Diesel	0.910	1.682	0.028	0.027	NA	NA	0.910	203.184	0.005	0.032
MARIN	2026	MCY	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2026	MDV	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2026	MDV	Diesel	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2026	T6 instate cons	Diesel	2.071	2.955	0.001	0.001	NA	NA	2.071	602.445	0.002	0.095

PM2.5_STREX	PM2.5_PMTW	PM2.5_PMBW	PM10_RUNEX	PM10_IDL	PM10_STREX	PM10_PMTW	PM10_PMBW	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CH4_RUNEX	CH4_IDLEX	CH4_STREX	N2O_RUNEX	N2O_IDLEX	N2O_STRE	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HOT	ROG_RUNLOSS	ROG_REST	ROG_DIURT	TOG_RUN	TOG_IDLEX	TOG_STRE	TOG_HOTS	TOG_RUN	TOG_REST	TOG_DIURC	CO_RUNEX	CO_IDLEX	CO_STREX	SOx_RUNEX	SOx_IDLEX	SOx_STREX
0.001502384	0.002000001	0.015750005	0.001208253	0	0.001633979	0.008000002	0.036750011	229.518479	0	48.33855	0.001473	0	0.039246	0.00347673	0	0.022216	0.005409284	0	0.17149	0.084295	0.201621977	0.146705	0.148665	0.007893	0	0.18776	0.084295	0.201622	0.146705	0.148665	0.462245	0	2.028212	0.00227127	0	0.0004783
0	0.002000001	0.015750005	0.005045427	0	0	0.008000002	0.036750011	195.149796	0	0	0.000515	0	0	0.03067483	0	0	0.011081782	0	0	0	0	0	0	0.012616	0	0	0	0	0	0	0.2057425	0	0	0.00184487	0	0
0.001741497	0.002000001	0.015750005	0.001384642	0	0.001894036	0.008000002	0.036750011	272.492885	0	57.7735	0.002405	0	0.050294	0.00467088	0	0.024801	0.009850308	0	0.23893	0.142016	0.546901672	0.273314	0.289802	0.014374	0	0.261599	0.142016	0.546902	0.273314	0.289802	0.6171931	0	2.147223	0.00269654	0	0.0005717
0	0.002000001	0.015750005	0.071397719	0	0	0.008000002	0.036750011	361.640765	0	0	0.004735	0	0	0.05684489	0	0	0.10193336	0	0	0	0	0	0	0.116044	0	0	0	0	0	0	0.7925297	0	0	0.00341881	0	0
0.001503696	0.002000001	0.015750005	0.001238234	0	0.001635407	0.008000002	0.036750011	285.858697	0	61.77131	0.002146	0	0.054307	0.00430705	0	0.026924	0.008163063	0	0.246284	0.112772	0.424635098	0.264453	0.244832	0.011912	0	0.26965	0.112772	0.424635	0.264453	0.244832	0.5704226	0	2.599569	0.0028288	0	0.0006113
0	0.002000001	0.015750005	0.004395709	0	0	0.008000002	0.036750011	272.456247	0	0	0.000644	0	0	0.04282633	0	0	0.01386863	0	0	0	0	0	0	0.015789	0	0	0	0	0	0	0.1471033	0	0	0.00257569	0	0
0.000377535	0.002000001	0.032760009	0.002383307	0	0.000410604	0.008000002	0.076440022	944.041714	115.5503	18.23594	0.007774	0.110046	0.019992	0.01016816	0.002941	0.036804	0.037045796	0.388768	0.100832	0.117849	0.930684396	0.023574	0.040346	0.054057	0.567289	0.110398	0.117849	0.930684	0.023574	0.040346	0.7286137	3.756997	1.693437	0.00934206	0.001143	0.0001805
0	0.003000001	0.032760009	0.018226993	0.027658	0	0.012000003	0.076440022	511.080191	126.5582	0	0.006872	0.005098	0	0.08033469	0.019893	0	0.147956537	0.10976	0	0	0	0	0	0.168439	0.124954	0	0	0	0	0	0.6596044	0.909745	0	0.00483155	0.001196	0
0.000299702	0.002000001	0.038220011	0.00212258	0	0.000325953	0.008000002	0.089180026	1074.28308	132.2706	20.47805	0.004862	0.109798	0.018533	0.00970541	0.002895	0.036691	0.020432532	0.382475	0.090324	0.090856	0.537426549	0.018901	0.030251	0.029815	0.558107	0.098894	0.090856	0.537427	0.018901	0.030251	0.3909334	3.769997	1.572206	0.0106309	0.001309	0.0002026
0	0.003000001	0.038220011	0.01942887	0.028007	0	0.012000003	0.089180026	567.308966	200.2827	0	0.006366	0.005098	0	0.08917307	0.031482	0	0.137056491	0.10976	0	0	0	0	0	0.15603	0.124954	0	0	0	0	0	0.6020836	0.909745	0	0.00536311	0.001893	0
0.002902266	0.001	0.005040001	0.002181528	0	0.003089649	0.004000001	0.011760003	217.537348	0	60.98198	0.337956	0	0.256868	0.06729766	0	0.015416	2.284680132	0	1.969935	0.701633	1.941391514	0.928304	1.54862	2.843388	0	2.14432	0.701633	1.941392	0.928304	1.54862	19.82735	0	9.226079	0.00215271	0	0.0006035
0.001539833	0.002000001	0.015750005	0.001238853	0	0.001674709	0.008000002	0.036750011	344.251293	0	74.35781	0.002385	0	0.058373	0.00465653	0	0.027437	0.009307897	0	0.27423	0.119462	0.419954266	0.296515	0.271736	0.013582	0	0.300248	0.119462	0.419954	0.296515	0.271736	0.5930809	0	2.748482	0.00340665	0	0.0007358
0	0.002000001	0.015750005	0.003594775	0	0	0.008000002	0.036750011	352.303835	0	0	0.000445	0	0	0.05537726	0	0	0.00957079	0	0	0	0	0	0	0.010896	0	0	0	0	0	0	0.203694	0	0	0.00333054	0	0
0	0.003000001	0.055860016	0.01186567	0.000919	0	0.012000003	0.130340037	1137.1923	598.1771	0	0.001043	0.002299	0	0.17875079	0.094025	0	0.022459672	0.049503	0	0	0	0	0	0.025569	0.056355	0	0	0	0	0	0.2051	2.073647	0	0.01074363	0.005651	0

2027 **Idling Emissions** grams/minute

County	Calendar Year	Vehicle Category	Fuel	ROG	NOx	Ex PM_{10}	Ex $PM_{2.5}$	Total PM_{10}	Total $PM_{2.5}$	CO	CO_2	CH_4	N_2O
MARIN	2027	LDA	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2027	LDA	Diesel	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2027	LDT1	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2027	LDT1	Diesel	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2027	LDT2	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2027	LDT2	Diesel	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2027	LHD1	Gasoline	3.757	0.034	0.000	0.000	NA	NA	3.757	115.550	0.110	0.003
MARIN	2027	LHD1	Diesel	0.910	1.716	0.028	0.026	NA	NA	0.910	126.558	0.005	0.020
MARIN	2027	LHD2	Gasoline	3.770	0.033	0.000	0.000	NA	NA	3.770	132.271	0.110	0.003
MARIN	2027	LHD2	Diesel	0.910	1.606	0.028	0.027	NA	NA	0.910	200.283	0.005	0.031
MARIN	2027	MCY	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2027	MDV	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2027	MDV	Diesel	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2027	T6 instate cons	Diesel	2.074	2.941	0.001	0.001	NA	NA	2.074	598.177	0.002	0.094

A-3 Operational MobileEmission Estimates

Total Emissions

Average Annual Emissions

EMFAC Results	running emissions				lbs/day						
construction year	**ROG**	**NOx**	**CO**	**Ex PM10**	**Ex PM2.5**	**Total PM10**	**Total PM2.5**	**CO2**	**CH4**	**N2O**	**CO2e**
Bird Pond											
2024 Bird Pond	0.24	0.61	137.83	0.01	0.01	0.03	0.02	190.06	0.00	0.03	199
2025 Bird Pond	0.67	0.17	0.00	0.00	0.00	83.95	84.48	47.39	0.03	0.01	0.00
Deer Island											
2026 Deer Island	0.62	0.56	133.18	0.01	0.01	0.00	0.00	184.40	0.00	0.03	193
2027 Deer Island	0.23	0.53	130.41	0.01	0.01	0.02	0.01	181.14	0.00	0.03	190

Average Annual Emissions

lbs/day

CALEEMOD Results	site emissions				**PM10**	**PM10**	**Total**	**PM2.5**	**PM2.5**	**Total**	**Total**
Bird Pond	**ROG**	**NOX**	**CO**	**SO2**	**Dust**	**Exh**	**PM10**	**Dust**	**Exh**	**PM2.5**	**CO2e**
2024 CALEEMOD 3.2 onsite =	0.03	0.30	0.16	0.00	0.07	0.01	0.09	0.00	0.01	0.05	37
2024 CALEEMOD 3.3 onsite =	0.10	1.02	0.82	0.00	0.30	0.04	0.34	0.12	0.04	0.16	180
2024 CALEEMOD 3.4 onsite =	0.11	1.07	0.89	0.00	0.37	0.05	0.42	0.13	0.04	0.17	189
2024 CALEEMOD 3.5 onsite =	0.02	0.22	0.18	0.00	0.45	0.01	0.46	0.17	0.01	0.01	32
2024 CALEEMOD 3.6 onsite =	0.03	0.25	0.19	0.00	0.10	0.01	0.11	0.04	0.01	0.05	43
2024 TOTALS =	**0.29**	**2.86**	**2.25**	**0.01**	**1.29**	**0.13**	**1.42**	**0.45**	**0.12**	**0.43**	**480**
2025 CALEEMOD 3.7 onsite =	0.01	0.14	0.08	0.00	0.08	0.01	0.09	0.04	0.01	0.04	19
2025 CALEEMOD 3.8 onsite =	0.04	0.39	0.25	0.00	0.44	0.02	0.45	0.02	0.02	0.18	65
2025 CALEEMOD 3.9 onsite =	0.01	0.64	0.57	0.00	0.24	0.03	0.26	0.08	0.03	0.11	135
2025 CALEEMOD 3.10 onsite =	0.01	0.10	0.06	0.00	0.10	0.00	0.11	0.04	0.00	0.44	12
2025 CALEEMOD 3.11 onsite =	0.02	0.14	0.12	0.00	0.10	0.01	0.11	0.04	0.01	0.05	19
2025 CALEEMOD 3.12 onsite =	0.01	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11
2025 TOTALS =	**0.09**	**1.46**	**1.14**	**0.00**	**0.96**	**0.06**	**1.03**	**0.22**	**0.06**	**0.82**	**261**
Deer Island											
2026 CALEEMOD 3.2 onsite =	0.04	0.41	0.24	0.00	0.23	0.02	0.25	0.11	0.12	0.13	56
2026 CALEEMOD 3.3 onsite =	0.13	1.16	1.23	0.00	0.09	0.05	0.14	0.01	0.05	0.06	227
2026 CALEEMOD 3.4 onsite =	0.17	1.75	1.23	0.00	0.54	0.04	0.61	0.23	0.07	0.30	307
2026 CALEEMOD 3.5 onsite =	0.17	1.71	1.07	0.00	1.44	0.08	1.52	0.74	0.07	0.81	222
2026 TOTALS =	**0.51**	**5.03**	**3.77**	**0.01**	**2.30**	**0.19**	**2.52**	**1.09**	**0.31**	**1.30**	**812**
2027 CALEEMOD 3.6 onsite =	0.30	3.10	1.82	0.01	1.83	0.13	1.95	0.89	0.11	1.01	495
2027 CALEEMOD 3.7 onsite =	0.00	0.02	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5
2027 CALEEMOD 3.8 onsite =	0.05	0.46	0.39	0.00	0.05	0.02	0.07	0.00	0.02	0.02	92
2027 CALEEMOD 3.9 onsite =	0.02	0.12	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	32
2027 CALEEMOD 3.10 onsite =	0.00	0.10	0.06	0.00	0.07	0.00	0.08	0.04	0.00	0.04	12
2027 CALEEMOD 3.11 onsite =	0.01	0.12	0.09	0.00	0.02	0.00	0.02	0.00	0.00	0.00	24
2027 CALEEMOD 3.12 onsite =	0.00	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11
2027 TOTALS =	**0.38**	**3.97**	**2.54**	**0.01**	**1.97**	**0.15**	**2.12**	**0.93**	**0.13**	**1.07**	**673**

Average Annual Emissions

lbs/day

Total EMFAC and CALEEMOD Results	site emissions				**PM10**	**PM10**	**Total**	**PM2.5**	**PM2.5**	**Total**	**Total**
Bird Pond	**ROG**	**NOX**	**CO**	**SO2**	**Dust**	**Exh**	**PM10**	**Dust**	**Exh**	**PM2.5**	**CO2e**
2024 Bird Pond	0.53	3.48	2.26	0.01	1.29	0.14	1.45	0.45	0.13	0.45	679
2025 Bird Pond	0.76	1.63	1.14	0.00	0.96	0.13	84.98	0.22	0.06	85.31	261
Deer Island											
2026 Deer Island	1.13	5.59	3.78	0.01	2.30	0.20	2.52	1.09	0.32	1.30	1005
2027 Deer Island	0.61	4.50	2.55	0.01	1.97	0.16	2.12	0.93	0.14	1.08	862
Grand Totals =	**3.03**	**15.20**	**9.72**	**0.02**	**6.52**	**0.62**	**91.06**	**2.69**	**0.65**	**88.14**	**2808**

MT/day	**5.6**
MT/Yr	**2040.4**
Amortized Emissions MT/Yr	**68.0**

EMFAC - TOTAL CO2 from 2024 thru 2027

Year	Diesel Idling Emissions (MT/Yr)	Diesel Running Emissions (MT/Yr)	Diesel Total Emissions (MT/Yr)	Amortized Total CO2 Emissions (MT/Yr)
2024	5.70	14.95	20.65	0.04
2025	0.19	6.72	6.90	0.02
2026	0.19	19.88	20.07	0.05
2027	5.53	15.56	21.10	0.04
TOTAL	**11.60**	**57.12**	**68.72**	**0.16**

Year	Gasoline Idling Emissions (MT/Yr)	Gsoline Running Emissions (MT/Yr)	Gasoline Total Emissions (MT/Yr)	Amortized Total CO2 Emissions (MT/Yr)
2024	1.53	14.85	16.38	0.04
2025	1.48	10.73	12.21	0.03
2026	0.05	19.67	19.72	0.05
2027	0.05	19.30	19.35	0.05
TOTAL	**3.11**	**64.55**	**67.67**	**0.18**

2024 **Idling Emissions** grams/minute

County	Calendar Year	Vehicle Category	Fuel	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O	CO2e
MARIN	2024	LDA	Diesel	0.00	0.00	0.00	0.00	NA	NA	0.00	0.00	0.00	0.00	0
MARIN	2024	LDT1	Diesel	0.00	0.00	0.00	0.00	NA	NA	0.00	0.00	0.00	0.00	0
MARIN	2024	LDT2	Diesel	0.00	0.00	0.00	0.00	NA	NA	0.00	0.00	0.00	0.00	0
MARIN	2024	LHD1	Diesel	0.91	1.97	0.03	0.03	NA	NA	0.91	131.99	0.01	0.02	138
MARIN	2024	LHD2	Diesel	0.91	1.85	0.03	0.03	NA	NA	0.91	208.79	0.01	0.03	219
MARIN	2024	MDV	Diesel	0.00	0.00	0.00	0.00	NA	NA	0.00	0.00	0.00	0.00	0
MARIN	2024	T6 instate constru	Diesel	2.07	2.99	0.00	0.00	NA	NA	2.07	611.50	0.00	0.10	640
			Total Diesel	3.89	6.81	0.06	0.05	0.00	0.00	3.89	**952.28**	0.01	0.15	**997**
MARIN	2024	LDA	Gasoline	0.00	0.00	0.00	0.00	NA	NA	0.00	0.00	0.00	0.00	0
MARIN	2024	LDT1	Gasoline	0.00	0.00	0.00	0.00	NA	NA	0.00	0.00	0.00	0.00	0
MARIN	2024	LDT2	Gasoline	0.00	0.00	0.00	0.00	NA	NA	0.00	0.00	0.00	0.00	0
MARIN	2024	LHD1	Gasoline	3.75	0.04	0.00	0.00	NA	NA	3.75	119.41	0.12	0.00	123
MARIN	2024	LHD2	Gasoline	3.76	0.04	0.00	0.00	NA	NA	3.76	136.99	0.12	0.00	141
MARIN	2024	MCY	Gasoline	0.00	0.00	0.00	0.00	NA	NA	0.00	0.00	0.00	0.00	0
MARIN	2024	MDV	Gasoline	0.00	0.00	0.00	0.00	NA	NA	0.00	0.00	0.00	0.00	0
			Total Gasoline	7.51	0.07	0.00	0.00	0.00	0.00	7.51	**256.40**	0.23	0.01	**264**
			Grand Total	15.28	13.70	0.11	0.11	NA	NA	15.28	2160.97	0.26	0.31	2258

DIESEL grams/day

	minutes idling per day	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
Hauling	15	58.28	102.18	0.85	0.82	0.00	0.00	58.28	14284.25	0.19	2.25
Vendor	5	19.43	34.06	0.28	0.27	0.00	0.00	19.43	4761.42	0.06	0.75
Worker	5	19.43	34.06	0.28	0.27	0.00	0.00	19.43	4761.42	0.06	0.75

lbs/day

	minutes idling per day	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
Hauling	15	0.13	0.23	0.00	0.00	NA	NA	0.13	31.46	0.00	0.00
Vendor	5	0.04	0.08	0.00	0.00	NA	NA	0.04	10.49	0.00	0.00
Worker	5	0.04	0.08	0.00	0.00	NA	NA	0.04	10.49	0.00	0.00
TOTALS =		0.21	0.38	0.00	0.00	0.00	0.00	0.21	52.44	0.00	0.01

239	days/phase
12533	lbs 2024
6	MT/2024
0.19	MT Amortized over 30 years

GASOLINE grams/day

	minutes idling per day	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
Hauling	15	112.67	1.10	0.00	0.00	0.00	0.00	112.67	3845.98	3.51	0.09
Vendor	5	37.56	0.37	0.00	0.00	0.00	0.00	37.56	1281.99	1.17	0.03
Worker	5	37.56	0.37	0.00	0.00	0.00	0.00	37.56	1281.99	1.17	0.03

lbs/day

	minutes idling per day	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
Hauling	15	0.25	0.00	0.00	0.00	NA	NA	0.25	8.47	0.01	0.00
Vendor	5	0.08	0.00	0.00	0.00	NA	NA	0.08	2.82	0.00	0.00
Worker	5	0.08	0.00	0.00	0.00	NA	NA	0.08	2.82	0.00	0.00
TOTALS =		0.41	0.00	0.00	0.00	0.00	0.00	0.41	14.12	0.01	0.00

239	days/phase
3374	lbs 2024
2	MT/2024
0.05	MT Amortized over 30 years

2025 **Idling Emissions** grams/minute

County	Calendar Year	Vehicle Category	Fuel	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O	CO2e
MARIN	2025	LDA	Diesel	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000	
MARIN	2025	LDT1	Diesel	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000	
MARIN	2025	LDT2	Diesel	3.753	0.036	0.000	0.000	NA	NA	3.753	118.220	0.115	0.003	
MARIN	2025	LHD1	Diesel	3.765	0.035	0.000	0.000	NA	NA	3.765	135.525	0.114	0.003	
MARIN	2025	LHD2	Diesel	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000	
MARIN	2025	MDV	Diesel	2.069	2.969	0.001	0.001	NA	NA	2.069	606.794	0.002	0.095	
MARIN	2025	T6 instate constru	Diesel	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000	
			Total Diesel	9.586	3.040	0.001	0.001	0.000	0.000	9.586	860.539	0.231	0.101	
MARIN	2025	LDA	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000	
MARIN	2025	LDT1	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000	
MARIN	2025	LDT2	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000	
MARIN	2025	LHD1	Gasoline	0.910	1.883	0.028	0.027	NA	NA	0.910	130.260	0.005	0.020	
MARIN	2025	LHD2	Gasoline	0.910	1.765	0.028	0.027	NA	NA	0.910	206.037	0.005	0.032	
MARIN	2025	MCY	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000	
MARIN	2025	MDV	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000	
			Total Gasoline	1.819	3.648	0.056	0.053	0.000	0.000	1.819	336.296	0.010	0.053	
			Grand Total	20.99	9.73	0.06	0.06	0.00	0.00	20.99	2057.37	0.47	0.26	

DIESEL grams/day

	minutes idling per day	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
Hauling	15	143.79	45.60	0.02	0.01	0.00	0.00	143.79	12908.09	3.47	1.52
Vendor	5	47.93	15.20	0.01	0.00	0.00	0.00	47.93	4302.70	1.16	0.51
Worker	5	47.93	15.20	0.01	0.00	0.00	0.00	47.93	4302.70	1.16	0.51

lbs/day

	minutes idling per day	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
Hauling	15	0.32	0.10	0.00	0.00	0.00	0.00	0.32	28.43	0.01	0.00
Vendor	5	0.11	0.03	0.00	0.00	0.00	0.00	0.11	9.48	0.00	0.00
Worker	5	0.11	0.03	0.00	0.00	0.00	0.00	0.11	9.48	0.00	0.00
TOTALS =		0.53	0.17	0.00	0.00	0.00	0.00	0.53	47.39	0.01	0.01

176	days/phase
8340	lbs 2025
4	MT/2025
0.13	MT Amortized over 30 years

GASOLINE grams/day

	minutes idling per day	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
Hauling	15	27.29	54.72	0.84	0.80	0.00	0.00	27.29	5044.45	0.15	0.79
Vendor	5	9.10	18.24	0.28	0.27	0.00	0.00	9.10	1681.48	0.05	0.26
Worker	5	9.10	18.24	0.28	0.27	0.00	0.00	9.10	1681.48	0.05	0.26

lbs/day

	minutes idling per day	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
Hauling	15	0.06	0.12	0.00	0.00	NA	NA	0.06	11.11	0.00	0.00
Vendor	5	0.02	0.04	0.00	0.00	NA	NA	0.02	3.70	0.00	0.00
Worker	5	0.02	0.04	0.00	0.00	NA	NA	0.02	3.70	0.00	0.00
TOTALS =		0.10	0.20	0.00	0.00	0.00	0.00	0.10	18.52	0.00	0.00

176	days/phase
3259	lbs 2025
1.5	MT/2025
0.05	MT Amortized over 30 years

2026 **Idling Emissions** grams/minute

County	Calendar Year	Vehicle Category	Fuel	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
MARIN	2026	LDA	Diesel	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2026	LDT1	Diesel	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2026	LDT2	Diesel	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2026	LHD1	Diesel	0.910	1.797	0.028	0.027	NA	NA	0.910	128.442	0.005	0.020
MARIN	2026	LHD2	Diesel	0.910	1.682	0.028	0.027	NA	NA	0.910	203.184	0.005	0.032
MARIN	2026	MDV	Diesel	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2026	T6 instate const he	Diesel	2.071	2.955	0.001	0.001	NA	NA	2.071	602.445	0.002	0.095
			Total Diesel	3.891	6.434	0.057	0.054	0.000	0.000	3.891	934.071	0.012	0.147
MARIN	2026	LDA	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2026	LDT1	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2026	LDT2	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2026	LHD1	Gasoline	3.755	0.035	0.000	0.000	NA	NA	3.755	116.933	0.112	0.003
MARIN	2026	LHD2	Gasoline	3.768	0.034	0.000	0.000	NA	NA	3.768	133.941	0.112	0.003
MARIN	2026	MCY	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2026	MDV	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
			Total Gasoline	7.522	0.069	0.000	0.000	0.000	0.000	7.522	250.874	0.224	0.006
			Grand Total	15.30	12.94	0.11	0.11	NA	NA	15.30	2119.02	0.25	0.30

DIESEL grams/day

	minutes idling per day	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
Hauling	15	58.36	96.51	0.85	0.81	0.00	0.00	58.36	14011.06	0.19	2.20
Vendor	5	19.45	32.17	0.28	0.27	0.00	0.00	19.45	4670.35	0.06	0.73
Worker	5	19.45	32.17	0.28	0.27	0.00	0.00	19.45	4670.35	0.06	0.73

lbs/day

	minutes idling per day	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
Hauling	15	0.13	0.21	0.00	0.00	NA	NA	0.13	30.86	0.00	0.00
Vendor	5	0.04	0.07	0.00	0.00	NA	NA	0.04	10.29	0.00	0.00
Worker	5	0.04	0.07	0.00	0.00	NA	NA	0.04	10.29	0.00	0.00
TOTALS =		0.21	0.35	0.00	0.00	0.00	0.00	0.21	51.44	0.00	0.01

239	days/phase
12293	lbs 2026
6	MT/2026
0.19	MT Amortized over 30 years

GASOLINE grams/day

	minutes idling per day	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
Hauling	15	112.84	1.04	0.00	0.00	0.00	0.00	112.84	3763.11	3.37	0.09
Vendor	5	37.61	0.35	0.00	0.00	0.00	0.00	37.61	1254.37	1.12	0.03
Worker	5	37.61	0.35	0.00	0.00	0.00	0.00	37.61	1254.37	1.12	0.03

lbs/day

	minutes idling per day	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
Hauling	15	0.25	0.00	0.00	0.00	NA	NA	0.25	8.29	0.01	0.00
Vendor	5	0.08	0.00	0.00	0.00	NA	NA	0.08	2.76	0.00	0.00
Worker	5	0.08	0.00	0.00	0.00	NA	NA	0.08	2.76	0.00	0.00
TOTALS =		0.41	0.00	0.00	0.00	0.00	0.00	0.41	13.81	0.01	0.00

239	days/phase
3302	lbs 2026
2	MT 2026
0.05	MT Amortized over 30 years

2027 **Idling Emissions** grams/minute

County	Calendar Year	Vehicle Category	Fuel	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
MARIN	2027	LDA	Diesel	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2027	LDT1	Diesel	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2027	LDT2	Diesel	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2027	LHD1	Diesel	0.910	1.716	0.028	0.026	NA	NA	0.910	126.558	0.005	0.020
MARIN	2027	LHD2	Diesel	0.910	1.606	0.028	0.027	NA	NA	0.910	200.283	0.005	0.031
MARIN	2027	MDV	Diesel	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2027	T6 instate constru	Diesel	2.074	2.941	0.001	0.001	NA	NA	2.074	598.177	0.002	0.094
			Total Diesel	3.893	6.263	0.057	0.054	0.000	0.000	3.893	925.018	0.012	0.145
MARIN	2027	LDA	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2027	LDT1	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2027	LDT2	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2027	LHD1	Gasoline	3.757	0.034	0.000	0.000	NA	NA	3.757	115.550	0.110	0.003
MARIN	2027	LHD2	Gasoline	3.770	0.033	0.000	0.000	NA	NA	3.770	132.271	0.110	0.003
MARIN	2027	MCY	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
MARIN	2027	MDV	Gasoline	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
			Total Gasoline	7.527	0.067	0.000	0.000	0.000	0.000	7.527	247.821	0.220	0.006
			Grand Total	15.31	12.59	0.11	0.11	NA	NA	15.31	2097.86	0.24	0.30

DIESEL grams/day

	minutes idling per day	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
Hauling	15	58.40	93.95	0.85	0.81	0.00	0.00	58.40	13875.27	0.19	2.18
Vendor	5	19.47	31.32	0.28	0.27	0.00	0.00	19.47	4625.09	0.06	0.73
Worker	5	19.47	31.32	0.28	0.27	0.00	0.00	19.47	4625.09	0.06	0.73

lbs/day

	minutes idling per day	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
Hauling	15	0.13	0.21	0.00	0.00	NA	NA	0.13	30.56	0.00	0.00
Vendor	5	0.04	0.07	0.00	0.00	NA	NA	0.04	10.19	0.00	0.00
Worker	5	0.04	0.07	0.00	0.00	NA	NA	0.04	10.19	0.00	0.00
TOTALS =		0.21	0.34	0.00	0.00	0.00	0.00	0.21	50.94	0.00	0.01

239	days/phase
12174	lbs 2027
6	MT/2027
0.18	MT Amortized over 30 years

GASOLINE grams/day

	minutes idling per day	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
Hauling	15	112.90	1.01	0.00	0.00	0.00	0.00	112.90	3717.31	3.30	0.09
Vendor	5	37.63	0.34	0.00	0.00	0.00	0.00	37.63	1239.10	1.10	0.03
Worker	5	37.63	0.34	0.00	0.00	0.00	0.00	37.63	1239.10	1.10	0.03

lbs/day

	minutes idling per day	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
Hauling	15	0.25	0.00	0.00	0.00	NA	NA	0.25	8.19	0.01	0.00
Vendor	5	0.08	0.00	0.00	0.00	NA	NA	0.08	2.73	0.00	0.00
Worker	5	0.08	0.00	0.00	0.00	NA	NA	0.08	2.73	0.00	0.00
TOTALS =		0.41	0.00	0.00	0.00	0.00	0.00	0.41	13.65	0.01	0.00

239	days/phase
3262	lbs 2024
1	MT/2024
0.05	MT Amortized over 30 years

Idling Emissions
TOTAL CO2 from 2024 thru 2027

Diesel Emissions	MT/yr
2024	5.70
2025	0.19
2026	0.19
2027	5.53
TOTAL	**11.60**

Gasoline Emissions	MT/yr
2024	2
2025	1
2026	0
2027	0
TOTAL	**3**

2024			Running…Emissions	grams/mile									
County	Calendar Year	Vehicle Category	Fuel	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
MARIN	2024	LDA	Diesel	0.015	0.086	0.008	0.008	0.053	0.025	211.33	211.33	0.001	0.033
MARIN	2024	LDT1	Diesel	0.198	1.022	0.152	0.146	0.197	0.164	403.18	403.18	0.009	0.063
MARIN	2024	LDT2	Diesel	0.014	0.037	0.005	0.005	0.050	0.022	292.75	292.75	0.001	0.046
MARIN	2024	LHD1	Diesel	0.160	1.596	0.023	0.022	0.111	0.057	537.52	537.52	0.007	0.084
MARIN	2024	LHD2	Diesel	0.143	1.010	0.021	0.020	0.122	0.061	595.82	595.82	0.007	0.094
MARIN	2024	MDV	Diesel	0.011	0.040	0.005	0.004	0.049	0.022	380.30	380.30	0.001	0.060
MARIN	2024	T6 instate c	Diesel	0.026	2.420	0.012	0.012	0.155	0.071	1169.79	1169.79	0.001	0.184
			Total Diesel	0.568	6.211	0.226	0.216	0.737	0.423	3590.693	3590.693	0.026	0.564
MARIN	2024	LDA	Gasoline	0.008	0.035	0.001	0.001	0.046	0.019	249.38	249.38	0.002	0.004
MARIN	2024	LDT1	Gasoline	0.015	0.070	0.002	0.002	0.046	0.019	294.44	294.44	0.004	0.006
MARIN	2024	LDT2	Gasoline	0.011	0.057	0.001	0.001	0.046	0.019	314.73	314.73	0.003	0.005
MARIN	2024	LHD1	Gasoline	0.052	0.222	0.002	0.002	0.087	0.037	986.65	986.65	0.011	0.013
MARIN	2024	LHD2	Gasoline	0.032	0.202	0.002	0.002	0.099	0.042	1124.04	1124.04	0.007	0.013
MARIN	2024	MCY	Gasoline	2.336	1.186	0.002	0.002	0.018	0.008	218.01	218.01	0.343	0.068
MARIN	2024	MDV	Gasoline	0.014	0.069	0.001	0.001	0.046	0.019	379.17	379.17	0.003	0.006
			Total Gasoline	2.468	1.841	0.013	0.012	0.389	0.164	3566.421	3566.421	0.372	0.115
			Grand Total	3.603	14.264	0.464	0.443	1.862	1.009	10747.81	10747.81	0.425	1.244

DIESEL grams/day

	One way trips (miles)	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
Hauling	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	6.6	3.75	41.00	1.49	1.42	4.86	2.79	23698.57	23698.57	0.17	3.73
Worker	10.8	6.13	67.08	2.44	2.33	7.95	4.56	38779.49	38779.49	0.28	6.10

lbs/day

	One way trips (miles)	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
Hauling	0	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Vendor	6.6	0.008	0.090	0.003	0.003	0.011	0.006	52.200	52.200	0.000	0.008
Worker	10.8	0.014	0.148	0.005	0.005	0.018	0.010	85.417	85.417	0.001	0.013
TOTALS =		0.027	0.238	0.009	0.008	0.028	0.016	137.617	137.617	0.001	0.022

239	days/phase
32890	lbs 2024
15	MT/2024
0.5	MT Amortized over 30 years

GASOLINE grams/day

	One way trips (miles)	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
Hauling	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	6.6	16.29	12.15	0.08	0.08	2.57	1.08	23538.38	23538.38	2.46	0.76
Worker	10.8	26.65	19.89	0.14	0.12	4.20	1.77	38517.34	38517.34	4.02	1.24

lbs/day

	One way trips (miles)	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
Hauling	0	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Vendor	6.6	0.036	0.027	0.000	0.000	0.006	0.002	51.847	51.847	0.005	0.002
Worker	10.8	0.059	0.044	0.000	0.000	0.009	0.004	84.840	84.840	0.009	0.003
TOTALS =		0.100	0.071	0.000	0.000	0.015	0.006	136.687	136.687	0.014	0.004

239	days/phase
32668	lbs 2024
15	MT/2024
0.5	MT Amortized over 30 years

2025													
County	Calendar Year	Vehicle Category	Fuel	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
MARIN	2025	LDA	Diesel	0.014	0.073	0.007	0.007	0.052	0.025	205.777	205.777	0.001	0.032
MARIN	2025	LDT1	Diesel	0.181	0.928	0.139	0.133	0.183	0.150	394.766	394.766	0.008	0.062
MARIN	2025	LDT2	Diesel	0.014	0.035	0.005	0.004	0.049	0.022	285.880	285.880	0.001	0.045
MARIN	2025	LHD1	Diesel	0.155	1.412	0.021	0.020	0.109	0.056	528.935	528.935	0.007	0.083
MARIN	2025	LHD2	Diesel	0.141	0.895	0.020	0.019	0.121	0.061	586.461	586.461	0.007	0.092
MARIN	2025	MDV	Diesel	0.011	0.037	0.004	0.004	0.049	0.022	370.597	370.597	0.000	0.058
MARIN	2025	T6 instate c	Diesel	0.025	2.419	0.012	0.012	0.155	0.071	1156.792	1156.792	0.001	0.182
			Total Diesel	0.541	5.800	0.208	0.199	0.719	0.406	3529.208	3529.208	0.025	0.555
MARIN	2025	LDA	Gasoline	0.007	0.031	0.001	0.001	0.046	0.019	242.051	242.051	0.002	0.004
MARIN	2025	LDT1	Gasoline	0.013	0.061	0.002	0.001	0.046	0.019	286.462	286.462	0.003	0.005
MARIN	2025	LDT2	Gasoline	0.010	0.051	0.001	0.001	0.046	0.019	304.337	304.337	0.003	0.005
MARIN	2025	LHD1	Gasoline	0.046	0.201	0.002	0.002	0.087	0.037	973.204	973.204	0.010	0.012
MARIN	2025	LHD2	Gasoline	0.028	0.180	0.002	0.002	0.099	0.042	1108.273	1108.273	0.006	0.012
MARIN	2025	MCY	Gasoline	2.317	1.184	0.002	0.002	0.018	0.008	217.838	217.838	0.341	0.068
MARIN	2025	MDV	Gasoline	0.012	0.060	0.001	0.001	0.046	0.019	366.504	366.504	0.003	0.005
			Total Gasoline	2.433	1.768	0.012	0.011	0.389	0.163	3498.669	3498.669	0.367	0.111
			Grand Total	3.514	13.369	0.429	0.410	1.827	0.975	10557.084	10557.084	0.418	1.221

DIESEL grams/day

	One way trips (miles)	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
Hauling	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	6.6	3.57	38.28	1.37	1.31	4.75	2.68	23292.77	23292.77	0.17	3.66
Worker	10.8	5.84	62.65	2.25	2.15	7.77	4.39	38115.44	38115.44	0.27	5.99

lbs/day

	One way trips (miles)	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
Hauling	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Vendor	6.6	0.008	0.084	0.003	0.003	0.000	0.000	51.306	51.306	0.000	0.008
Worker	10.8	0.013	0.138	0.005	0.005	0.000	0.000	83.955	83.955	0.001	0.013

176	days/phase
14776	lbs 2025
7	MT/2025
0.2	MT Amortized over 30 years

GASOLINE grams/day

	One way trips (miles)	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
Hauling	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	6.6	16.06	11.67	0.08	0.07	2.57	1.08	23091.21	23091.21	2.42	0.73
Worker	10.8	26.28	19.09	0.13	0.12	4.20	1.76	37785.62	37785.62	3.97	1.20

lbs/day

	One way trips (miles)	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
Hauling	0	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
Vendor	6.6	0.035	0.026	0.000	0.000	NA	NA	50.862	50.862	0.005	0.002
Worker	10.8	0.058	0.042	0.000	0.000	NA	NA	83.228	83.228	0.009	0.003
TOTALS =		0.093	0.068	0.000	0.000	0.000	0.000	134.090	134.090	0.014	0.004

176	days/phase
23600	lbs 2025
11	MT/2025
0.4	MT Amortized over 30 years

2026													
County	Calendar Year	Vehicle Category	Fuel	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
MARIN	2026	LDA	Diesel	0.013	0.061	0.006	0.006	0.051	0.024	200.371	200.371	0.001	0.031
MARIN	2026	LDT1	Diesel	0.159	0.808	0.121	0.115	0.165	0.133	384.597	384.597	0.007	0.060
MARIN	2026	LDT2	Diesel	0.014	0.034	0.005	0.004	0.049	0.022	279.174	279.174	0.001	0.044
MARIN	2026	LHD1	Diesel	0.151	1.246	0.020	0.019	0.108	0.054	520.086	520.086	0.007	0.082
MARIN	2026	LHD2	Diesel	0.139	0.794	0.020	0.019	0.121	0.060	576.914	576.914	0.006	0.091
MARIN	2026	MDV	Diesel	0.010	0.033	0.004	0.004	0.049	0.022	361.278	361.278	0.000	0.057
MARIN	2026	T6 instate c	Diesel	0.023	2.425	0.012	0.011	0.154	0.070	1146.959	1146.959	0.001	0.180
			Total Diesel	0.509	5.400	0.187	0.178	0.698	0.385	3469.379	3469.379	0.024	0.545
MARIN	2026	LDA	Gasoline	0.006	0.029	0.001	0.001	0.046	0.019	235.444	235.444	0.002	0.004
MARIN	2026	LDT1	Gasoline	0.011	0.054	0.001	0.001	0.046	0.019	279.184	279.184	0.003	0.005
MARIN	2026	LDT2	Gasoline	0.009	0.046	0.001	0.001	0.046	0.019	294.754	294.754	0.002	0.005
MARIN	2026	LHD1	Gasoline	0.042	0.182	0.002	0.002	0.087	0.037	958.981	958.981	0.009	0.011
MARIN	2026	LHD2	Gasoline	0.023	0.158	0.002	0.002	0.099	0.042	1091.543	1091.543	0.005	0.011
MARIN	2026	MCY	Gasoline	2.300	1.181	0.002	0.002	0.018	0.008	217.679	217.679	0.339	0.067
MARIN	2026	MDV	Gasoline	0.010	0.053	0.001	0.001	0.046	0.019	354.901	354.901	0.003	0.005
			Total Gasoline	2.402	1.704	0.012	0.011	0.388	0.163	3432.486	3432.486	0.363	0.107
			Grand Total	3.420	12.504	0.385	0.368	1.783	0.934	10371.243	10371.243	0.410	1.198

DIESEL grams/day

	One way trips (miles)	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
Hauling	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	6.6	3.36	35.64	1.23	1.18	4.60	2.54	22897.90	22897.90	0.16	3.60
Worker	10.8	5.50	58.32	2.01	1.93	7.53	4.16	37469.29	37469.29	0.26	5.89

lbs/day

	One way trips (miles)	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
Hauling	0	0.00	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
Vendor	6.6	0.15	0.079	0.003	0.003	NA	NA	50.436	50.436	0.000	0.008
Worker	10.8	0.25	0.128	0.004	0.004	NA	NA	82.531	82.531	0.001	0.013
TOTALS =		0.404	0.207	0.007	0.007	0.000	0.000	132.967	132.967	0.001	0.021

329	days/phase
43746	lbs 2026
20	MT/2026
0.7	MT Amortized over 30 years

GASOLINE grams/day

	One way trips (miles)	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
Hauling	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	6.6	15.85	11.24	0.08	0.07	2.56	1.08	22654.41	22654.41	2.40	0.71
Worker	10.8	25.94	18.40	0.13	0.12	4.19	1.76	37070.85	37070.85	3.92	1.16

lbs/day

	One way trips (miles)	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
Hauling	0	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
Vendor	6.6	0.035	0.025	0.000	0.000	NA	NA	49.900	49.900	0.005	0.002
Worker	10.8	0.057	0.041	0.000	0.000	NA	NA	81.654	81.654	0.009	0.003
TOTALS =		0.092	0.065	0.000	0.000	0.000	0.000	131.553	131.553	0.014	0.004

329	days/phase
43281	lbs 2026
20	MT/2026
0.7	MT Amortized over 30 years

2027													
County	Calendar Year	Vehicle Category	Fuel	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
MARIN	2027	LDA	Diesel	0.011	0.050	0.005	0.005	0.050	0.023	195.150	195.150	0.001	0.031
MARIN	2027	LDT1	Diesel	0.102	0.491	0.071	0.068	0.116	0.086	361.641	361.641	0.005	0.057
MARIN	2027	LDT2	Diesel	0.014	0.032	0.004	0.004	0.049	0.022	272.456	272.456	0.001	0.043
MARIN	2027	LHD1	Diesel	0.148	1.097	0.018	0.017	0.107	0.053	511.080	511.080	0.007	0.080
MARIN	2027	LHD2	Diesel	0.137	0.707	0.019	0.019	0.121	0.060	567.309	567.309	0.006	0.089
MARIN	2027	MDV	Diesel	0.010	0.030	0.004	0.003	0.048	0.021	352.304	352.304	0.000	0.055
MARIN	2027	T6 instate c	Diesel	0.022	2.434	0.012	0.011	0.154	0.070	1137.192	1137.192	0.001	0.179
			Total Diesel	0.444	4.840	0.134	0.128	0.645	0.335	3397.132	3397.132	0.021	0.534
MARIN	2027	LDA	Gasoline	0.005	0.027	0.001	0.001	0.046	0.019	229.518	229.518	0.001	0.003
MARIN	2027	LDT1	Gasoline	0.010	0.048	0.001	0.001	0.046	0.019	272.493	272.493	0.002	0.005
MARIN	2027	LDT2	Gasoline	0.008	0.042	0.001	0.001	0.046	0.019	285.859	285.859	0.002	0.004
MARIN	2027	LHD1	Gasoline	0.037	0.164	0.002	0.002	0.087	0.037	944.042	944.042	0.008	0.010
MARIN	2027	LHD2	Gasoline	0.020	0.141	0.002	0.002	0.099	0.042	1074.283	1074.283	0.005	0.010
MARIN	2027	MCY	Gasoline	2.285	1.178	0.002	0.002	0.018	0.008	217.537	217.537	0.338	0.067
MARIN	2027	MDV	Gasoline	0.009	0.047	0.001	0.001	0.046	0.019	344.251	344.251	0.002	0.005
			Total Gasoline	2.375	1.647	0.012	0.011	0.388	0.163	3367.983	3367.983	0.359	0.104
			Grand Total	3.263	11.327	0.280	0.267	1.678	0.833	10162.248	10162.248	0.400	1.172

DIESEL grams/day

	One way trips (miles)	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
(Concrete) Hauling	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	6.6	2.93	31.94	0.88	0.85	4.26	2.21	22421.07	22421.07	0.14	3.52
Worker	10.8	4.79	52.27	1.45	1.38	6.97	3.62	36689.03	36689.03	0.22	5.77

lbs/day

	One way trips (miles)	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
Hauling	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Vendor	6.6	0.006	0.070	0.002	0.002	0.009	0.005	49.386	49.386	0.000	0.008
Worker	10.8	0.011	0.115	0.003	0.003	0.015	0.008	80.813	80.813	0.000	0.013
TOTALS =		0.017	0.185	0.005	0.005	0.025	0.013	130.198	130.198	0.001	0.020

263	days/phase
34242	lbs 2027
16	MT/2027
0.5	MT Amortized over 30 years

GASOLINE grams/day

	One way trips (miles)	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
Hauling	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	6.6	15.67	10.87	0.08	0.07	2.56	1.07	22228.69	22228.69	2.37	0.69
Worker	10.8	25.65	17.79	0.13	0.12	4.19	1.76	36374.22	36374.22	3.88	1.13

lbs/day

	One way trips (miles)	ROG	NOx	Ex PM10	Ex PM2.5	Total PM10	Total PM2.5	CO	CO2	CH4	N2O
Hauling	0	0.000	0.000	0.000	0.000	NA	NA	0.000	0.000	0.000	0.000
Vendor	6.6	0.035	0.024	0.000	0.000	NA	NA	48.962	48.962	0.005	0.002
Worker	10.8	0.056	0.039	0.000	0.000	NA	NA	80.119	80.119	0.009	0.002
TOTALS =		0.091	0.063	0.000	0.000	0.000	0.000	129.081	129.081	0.014	0.004

329	
42468	days/phase
19	lbs 2027
0.6	MT/2027
	MT Amortized over 30 years

Running Emissions
TOTAL CO2 from 2024 thru 2027

Diesel Emissions	MT/yr	Amortized MT/Yr
2024	15	0
2025	7	0
2026	20	1
2027	16	1
TOTAL	**57**	**2**

Gasoline Emissions	MT/yr	Amortized MT/Yr
2024	15	0.5
2025	11	0
2026	20	1
2027	19	1
TOTAL	**65**	**2.2**

Appendix B
Biological Resources

TABLE 1
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE STUDY AREA

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Study Area
Amphibians			
California giant salamander (*Dicamptodon ensatus*)	--/SSC	Vernal or temporary pools in annual grasslands, or open stages of woodlands. Typically adults use mammal burrows.	**Low**. Aquatic conditions are too saline for this species. No habitat present in the Study Area.
California tiger salamander (*Ambystoma californiense*)	FT/ST	Grasslands and low foothills with pools or ponds for breeding, typically vernal pools are ideal for natural breeding	**Not expected.** Site is out of the species' range and provides no habitat. Closest CNDDB occurrence is 20 miles northwest of the Study Area.
California red-legged frog (*Rana draytonii*)	FT/SSC	Streams, freshwater pools, and ponds with overhanging vegetation. Also found in woods adjacent to streams. Requires permanent or ephemeral water sources such as reservoirs and slow moving streams and needs pools of >0.5 m depth for breeding.	**Low**. Study Area is isolated and surrounded by development; aquatic conditions are too saline for this species.
Foothill yellow-legged frog (*Rana boylii*)	--/SSC	Partly-shaded, shallow streams & riffles with a rocky substrate in a variety of habitats; requires at least some cobble-sized substrate for egg-laying.	**Low.** Suitable habitat lacking in the Study Area. CNDDB occurrence from the Novato hills in 1947 (occurrence # 2359), south of Study Area, has been extirpated.
Red-bellied newt *(Taricha rivularis)*	--/SSC	Ranges within Sonoma, Mendocino, Humboldt. Lives in coastal woodlands, especially redwood forests.	**Not Expected.** Suitable habitat not found in Study Area.
Birds			
Black swift (*Cypseoloides niger*)	--/SSC (Nesting only)	Nests on cliff ledges behind or near waterfalls and sea caves. Forage over forests and open areas.	**Low.** Suitable foraging habitat in the Study Area, but nesting habitat is not present.
Short-eared owl (*Asio flammeus*)	--/SSC (Nesting only)	Found in swamp lands, both fresh and salt; lowland meadows; irrigated alfalfa fields. Tule patches/tall grass needed for nesting/daytime seclusion. Nests on dry ground in depression concealed in vegetation.	**Low.** Suitable open habitat is limited in the Study Area due to surrounding development.
Burrowing owl (*Athene cunicularia*)	--/SSC (Burrowing sites & some wintering sites)	Nests and forages in low-growing grasslands with burrowing mammals.	**Low**. Disturbed grasslands in the study area are unlikely to provide suitable habitat. Species occurrences are documented 6.25 miles north and northeast of the Study Area. Known to overwinter in Marin County, but no known nesting.
Western snowy plover (*Charadrius alexandrines nivosus*)	FT/SSC (Nesting only)	Sandy beaches, salt pond levees and shores of large alkali lakes. Needs sandy, gravelly or friable soils for nesting.	**Low.** Suitable sandy, gravelly soil habitat not found in the Study Area.
Northern harrier (*Circus cyaneus*)	--/SSC (Nesting only)	Nests on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas.	**Moderate (nesting).** Suitable foraging and nesting habitat along some of the edges of Deer Island basin; known nesting in marshes along San Pablo Bay.
White-tailed kite (*Elanus leucurus*)	--/CFP (Nesting only)	Nests in shrubs and trees adjacent to grasslands, forages over grasslands and agricultural lands	**High (nesting).** Suitable habitat and likely forages over marshes. Known to nest in the Deer Island Preserve.
Salt-marsh common yellowthroat (*Geothylpis thrichas sinuosa*)	BCC/SSC	In brackish and saline tidal marsh habitat around San Francisco Bay, associated with a high percent cover of bulrushes, perennial pepperweed, and rushes.	**Present.** Tidal marsh in Study Area provides suitable habitat for this species. Observed during nesting bird surveys in 2020.

TABLE 1 (CONTINUED)
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE STUDY AREA

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Study Area
Birds (cont.)			
California black rail (*Laterallus jamaicensis*)	BCC/ST/CFP	Found in salt, brackish and freshwater marsh with dense vegetation for nesting habitat.	**Moderate.** Tidal marsh in Study Area provides marginal habitat for this species. No black rails were observed in the surrounding Study Area during the WRA rail assessment in 2016 or the protocol-level survey in 2020 conducted by WRA.
Bank swallow (*Riparia riparia*)	--/ST (Nesting only)	Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole.	**Low.** Suitable habitat not found in the Study Area.
Alameda song sparrow (*Melospiza melodia pusillula*)	BCC/SSC	Salt marshes. Inhabits *Salicornia* marshes; nests low in *Grindelia* bushes (high enough to escape high tides) and in *Salicornia*.	**Low.** Study Area outside subspecies' range.
San Pablo song sparrow (*Melospiza melodia samuelis*)	BCC/SSC	High marsh, particularly pickleweed; their territories are densest in areas where tidal channels are lined with gumplant	**Present.** Observed foraging and singing within the marsh. Also observed during nesting bird surveys in 2020.
California Ridgway's rail [California clapper rail] (*Rallus obsoletus obsoletus*)	FE/SE/CFP	Found in salt and brackish marsh with well-defined tidal channels and dense growth of pickleweed; feeds on invertebrates in mud-bottomed sloughs.	**Moderate.** Suitable foraging and nesting habitat. Known to breed in tidal marshes. CNDDB occurrence in 1993 within the tidal marsh of Study Area.
Swainson's hawk *(Buteo swainsoni)*	--/BCC (Nesting only)	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or lines of trees. Requires adjacent suitable foraging areas such as grasslands, alfalfa, or grain fields supporting rodent populations. Northern habitat summer range in California begins in central Tehama south to Kern County. Predominant breeding habitat is located in the Central Valley.	**Low.** Study Area provides suitable foraging habitat, but outside of known nesting range. Flyover observations have been made in the vicinity of the study area, but the closest CNDDB occurrence of nesting is 11 miles northeast of the Study Area.
Tricolored blackbird *(Agelaius tricolor)*	--/ST/SSC (Nesting colony only)	Highly colonial species, most numerous in central valley and vicinity. Largely endemic to California. Requires open water, protected nesting substrate, and foraging area with insect prey within a few km of the colony. Forages in grassland and cropland. Nests in cattails, tules, and blackberries large enough for at least 50 nesting pairs.	**Low.** The Study Area does not provide foraging habitat or a large enough substrate for a nesting colony.
California least tern (*Sternula antillarum browni*)	FE/SE (Nesting colony only)	Nest on beaches, mudflats, and sand dunes, usually near shallow estuaries and lagoons with access to open ocean.	**Low.** Suitable beach and dune habitat is not present in the Study Area.
Fish			
Tidewater goby (*Eucyclogobius newberryi*)	FE/SSC	Found in shallow coastal lagoons and lower stream reaches, they need fairly still but not stagnant water & high oxygen levels	**Not Expected.** Extirpated from San Francisco Bay.
Tomales roach (*Lavinia symmetricus*)	--/SSC	Tributaries to Tomales Bay. They are predominantly found in small warm streams but are capable of thriving in larger colder streams with diverse conditions.	**Not Expected.** Restricted to the western Marin County drainages of Lagunitas Creek and Walker Creek.
Coho salmon – central California coast ESU (*Oncorhynchus kisutch)*	FE/SE	Coastal watersheds of central and northern California. Juveniles typically found in freshwater rivers and streams with slow moving water and fine gravel and mature in the open ocean.	**Not Expected.** Extirpated from San Francisco Bay.

TABLE 1 (CONTINUED)
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE STUDY AREA

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Study Area
Fish (cont.)			
Eulachon (*Thaleichthys pacificus*)	FT/--	Spawn in lower reaches of coastal rivers with moderate water velocities and bottom of pea sized gravel, sand, and woody debris.	**Low.** Study Area lacks suitable spawning and rearing habitat. One 2003 occurrence within the San Pablo Bay (CNDDB occurrence # 8) is approximately 10 miles from the Study Area.
Steelhead – Central California Coast DPS (*Oncorhynchus mykiss*)	FT/--	Requires cold, freshwater streams with suitable gravel for spawning. Rears in rivers and tributaries to the San Francisco Bay.	**High.** Novato Creek watershed supports rearing and spawning habitat for steelhead. Steelhead have been observed during fish relocation within Novato Creek in 2016 and 2020.
Longfin smelt (*Spirinchus thaleichthys*)	FC/ST	Occur in the middle or bottom of water column in salt or brackish water portions of the San Francisco Bay-Delta. Concentrated in Suisun, San Pablo, and North San Francisco Bays.	**Moderate.** Present in San Pablo Bay and may occasionally occur in the tidal portions of the Study Area.
Sacramento splittail (*Pogonichthys macrolepidotus*)	--/SSC	Splittail are adjusted to a wide range of salinities and temperatures and depend on both brackish water for rearing habitat and floodplain/river-edge habitat for spawning.	**Low.** Once abundant throughout the San Francisco Estuary, splittail are now confined to Suisun Bay, Suisun Marsh, and the Napa, Petaluma, and Sacramento River systems.
Invertebrates			
Western bumble bee (*Bombus occidentalis*)	--/SE	Found in any area with sufficient flowers for nutrition, and underground burrows, mostly restricted to high elevation sites in the Sierra Nevada.	**Low.** Limited flowering plants present in the developed area surrounding the Study Area. One historic occurrence within the City of Novato (CNDDB occurrence #189) in 1962.
Mammals			
Pallid bat (*Antrozous pallidus*)	--/SSC/WBWG High	Grasslands, shrublands, woodlands, and forests. Common in arid regions with rocky outcroppings, particularly near water. Roosts in rock crevices, buildings, and under bridges. Very sensitive to disturbance.	**Low.** Although suitable habitat is present in Study Area, high levels of disturbance to potential roost areas may preclude presence.
Point Reyes mountain beaver (*Aplodontia rufa phaea*)	--/SSC	Coastal scrub, meadow and seeps. Prefers north-facing slopes of hills and gullies in areas overgrown with sword ferns and thimbleberries.	**Not Expected.** Study Area is outside of species' known range.
Townsend's big-eared bat (*Corynorhinus townsendii*)	--/SSC/ WBWG High	Herbaceous, shrub, and open stages of most habitats with dry, friable soils. Roost in caves, mines, tunnels with minimal disturbance but can also be found in abandoned open buildings or other human made structures.	**Low.** Suitable herbaceous, shrub, and open habitat is present within the Study Area, but dry friable soils are lacking. No known potential roost sites within the Study Area.
Silver-haired bat (*Lasionycteris noctivagans*)	--/--/WBWB Medium	Forest and woodland habitats near bodies of water, such as rivers, lakes, streams, estuaries or ponds. Solitary rooster behind tree bark, but have been found in buildings, mines, woodpecker holes, and birds' nests.	**Moderate.** Suitable foraging and marginal roosting habitat within oak woodlands and forested wetlands within the Study Area.
Hoary bat (*Lasiurus cinereus*)	--/--/WBWG Medium	Prefers open habitats or habitat mosaics, with access to trees for cover & open areas or habitat edges for feeding. Solitary rooster in dense foliage of medium to large trees. Feeds primarily on moths. Requires water.	**Moderate**. Forested wetlands and oak woodlands provide marginal roosting habitat. Seasonal wetlands provide open foraging habitat.

TABLE 1 (CONTINUED)
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE STUDY AREA

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Study Area
Mammals (cont.)			
Western red bat (*Lasiurus blossevillii*)	--/SSC/ WBWG High	Forages over a wide variety of habitats including grasslands, shrublands, open woodlands and forests, and croplands. Roost alone in leaves of trees and leaf litter in the winter.	**Moderate.** Suitable foraging habitat and roost trees within forested wetlands and oak woodlands within the Study Area.
San Pablo vole (*Microtus californicus sanpabloensis*)	--/SSC	Constructs burrow in soft soil. Feeds on grasses, sedges and herbs. Forms a network of runways leading from the burrow	**Not Expected.** Study Area outside of species' known range.
Long-legged myotis (*Myotis volans)*	--/--/WBWG High	Common in woodland and forested habitats above 4,000 ft. Establish roosts in trees, rock crevices, fissures in stream banks, and buildings.	**Low.** Marginal suitable habitat for tree roosting. Study Area elevation well below 4,000 ft.
Yuma myotis (*Myotis yumanensis*)	--/--/WBWG Low-Medium	Occurs within a wide variety of habitats below 8,000 ft. Optimal habitats are open forests and woodlands with sources of water over which to feed. Usually roost in buildings, under bridges, and in caves and mines.	**Moderate.** May forage in or around Study Area. Potential roosting habitat under railroad bridge adjacent to the Study Area, but unlikely to roost within the Study Area.
Salt-marsh harvest mouse (*Reithrodontomys raviventris*)	FE/SE/CFP	Pickleweed is primary habitat, but may occur in other marsh vegetation types and in adjacent upland areas. Does not burrow, builds loosely organized nests. Requires higher areas for flood escape.	**Moderate.** Suitable tidal marsh and diked seasonal wetland habitat within the Study Area.
Salt-marsh wandering shrew (*Sorex vagrans halicoetes*)	--/SSC	Marsh and wetlands. Medium high marsh 6-8 ft above sea level where abundant driftwood is scattered among pickleweed	**Low.** Although the Study Area provides suitable habitat, this species is geographically limited to the south bay. No nearby recent CNDDB occurrences.
Suisun shrew (*Sorex ornatus sinuosus*)	--/SSC	Marsh and wetlands. Tidal marsh of the northern shores of San Pablo and Suisun bays. Requires dense low-lying cover and driftweed and other litter above the mean hightide line for nesting and foraging.	**Moderate.** Diked seasonal wetland basins may provide low quality habitat within the Study Area.
American badger (*Taxidea taxus*)	--/SSC	Herbaceous, shrub, and open stages of most habitats with dry, friable soils.	**Low.** No suitable open, dry habitat in the Study Area.
Reptiles			
Western pond turtle (*Actinemys marmorata*)	--/SSC	Ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation <6,000' in elevation. Require basking area and upland habitat for egg laying (sandy banks and open, grassy fields)	**Present.** Suitable breeding habitat and observed basking in Duck Bill pond in the Study Area.
Plants			
Napa false indigo (*Amorpha californica* var. *napensis*)	--/--/1B.2	Broadleafed upland forest, chaparral, or cismontane woodland. Blooms April–July. Elevation up to 2000 meters.	**Not Expected.** No nearby recent occurrences. No suitable habitat present.
Bent-flowered fiddleneck (*Amsinckia lunaris*)	--/--/1B.2	Cismontane woodland, valley and foothill grassland, and coastal bluff scrub. Blooms March–June. Elevation up to 500 meters.	**Low.** Non-native, annual grassland provides suitable habitat. Nearest occurrence is from 1938 and is approximately 4.8 mi away (CNDDB Occurrence #15).
Mt. Tamalpais manzanita (*Arctostaphylos montana* subsp. *montana*)	--/--/1B.3	Serpentine chaparral. Blooms February–April. Elevation ranges from 250-800 meters.	**Not Expected.** No suitable habitat in the Study Area. Study Area not within elevation range.

TABLE 1 (CONTINUED)
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE STUDY AREA

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Study Area
Plants (cont.)			
Franciscan onion (*Allium peninsulare* var. *franciscanum*)	--/--/1B.2	Cismontane woodland, valley and foothill grassland. Clay soils; often on serpentine; sometimes on volcanics. Dry hillsides. Elevation ranges from 5-320 meters.	**Low.** Non-native, annual grassland on clay soils provides suitable habitat., but nearest occurrence is 9.1 mi away and is from 1880 (CNDDB Occurrence #10).
Marin manzanita (*Arctostaphylos virgata*)	--/--/1B.2	Sandstone, granite outcrops in chaparral, and conifer forests. Blooms December–March. Elevation up to 500 meters.	**Not Expected.** No suitable habitat in the Study Area.
Coastal marsh milk-vetch (*Astragalus pycnostachyus* var. *pycnostachyus*)	--/--/1B.2	Coastal marshes, seeps, and adjacent sand. Blooms June–September. Elevation up to 150 meters.	**Not Expected.** Species ranch is restricted to the coast.
Alkali-milk vetch (*Astragalus tener* var. *tener*)	--/--/1B.2	Alkaline flats, vernally moist meadows. Blooms March–June. Elevation up to 60 meters.	**Not Expected.** No documented occurrences within Marin County.
Sonoma sunshine (*Blennosperma bakeri*)	FE/SE/1B.1	Wetlands, vernal pools, valley grassland, freshwater wetlands, wetland riparian. Blooms March–May. Elevation ranges from 10-110 meters.	**Not Expected.** No documented occurrences within Marin County.
Thurber's reed grass (*Calamagrostis crassiglumis*)	--/--/2B.1	Mesic coastal scrub, freshwater marshes and swamps. Blooms May–August. Elevation ranges from 10- 60 meters.	**Low.** No nearby recent occurrences. Study Area not within elevation range.
Tiburon mariposa-lily (*Calochortus tiburonensis*)	FT/CT/1B.1	Open, rocky, slopes in serpentine grassland. Blooms March–June. Elevation up to 150 meters.	**Not Expected.** Endemic to Ring Mtn. Preserve on the Tiburon Peninsula. No suitable habitat within the Study Area.
Seaside bittercress (*Cardamine angulata)*	--/--/2B.2	Shady thickets, streambanks, lower montane coniferous forest, North Coast coniferous forest. Blooms March–July. Elevation 25-915 meters.	**Low.** No nearby recent occurrences and only marginal suitable habitat present.
Lyngbye's sedge (*Carex lyngbyei*)	--/--/2B.2	Marsh, swamp, and wetland (brackish or freshwater). Elevation range from 0-200 meters.	**Low.** No nearby recent occurrences and range typically is restricted to coastal areas.
Tiburon paintbrush (*Castilleja affinis* var. *neglecta*)	FE/CT/1B.2	Open serpentine grassland slopes. Blooms April–June. Elevation ranges from 60-400 meters.	**Not Expected.** No suitable habitat in the Study Area. Study Area also not within elevation range.
Johnny-nip (*Castilleja ambigua* subsp. *ambigua*)	--/--/4.2	Coastal bluffs and grasslands. Blooms May–August. Elevation ranges from 0-435 meters.	**Low.** Marginal suitable habitat present.
Nicasio ceanothus (*Ceanothus decornutus*)	--/--/1B.2	Open, rocky serpentine slopes and ridges. Blooms March–May. Elevation ranges from 235-290 meters.	**Not Expected.** No suitable habitat in the Study Area. Study Area also not within elevation range.
Mason's ceanothus (*Ceanothus masonii*)	--/CR/1B.2	Chaparral. Blooms March–April. Elevation ranges from 235-290 meters.	**Not Expected.** No suitable habitat in the Study Area. Study Area not within elevation range.
Pappose tarplant (*Centromadia* parryi subsp. *parryi)*	--/--/1B.2	Often alkaline: chaparral, coastal prairie, meadows and seeps, marshes and swamps (coastal salt), valley and foothill grassland. Blooms May–November. Elevation 0-420 meters.	**Not Expected.** No documented occurrences within Marin County.

TABLE 1 (CONTINUED)
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE STUDY AREA

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Study Area
Plants (cont.)			
Point Reyes salty bird's-beak (*Chloropyron maritimum* subsp. *palustre*)	--/--/1B.2	Coastal salt marsh. Blooms May–October. Elevation up to 10 meters.	**Moderate.** Tidal and diked salt marsh provide suitable habitat. A 1993 occurrence (CNDDB Occurrence #61) was approximately 4.5 miles away from Study Area.
Soft salty bird's-beak (*Chloropyron molle* subsp. *molle*)	FE/SR/1B.2	Coastal salt marsh. Blooms July–November. Elevation up to 10 meters.	**Low.** The tidal and diked salt marshes within the Study Area provide suitable habitat. However, it is believed to be extirpated from Marin County.
San Francisco Bay spineflower (*Chorizanthe cuspidata* var. *cuspidata*)	--/--/1B.2	Sand. Blooms April–July. Elevation up to 300 meters.	**Not Expected.** No suitable habitat within the Study Area.
Sonoma spineflower (*Chorizanthe valida*)	FE/SE/1B.1	Coastal prairie (sandy). Blooms June–August. Elevation 10-305 meters	**Not Expected.** No nearby occurrences or suitable habitat in the Study Area.
Mt. Tamalpais thistle (*Cirsium hydrophilum* var. *vaseyi*)	--/--/1B.2	Serpentine seeps. Blooms June–September. Elevation ranges from 300-450 meters.	**Not Expected.** No suitable habitat within Study Area. Study Area not within elevation range.
Round-headed collinsia (*Collinsia corymbosa*)	--/--/1B.2	Coastal sand dunes. Blooms April–June. Elevation up to 20 meters.	**Not Expected.** No suitable habitat present within Study Area.
Baker's larkspur (*Delphinium bakeri)*	FE/SE/1B.1	Broadleafed upland forest, coastal scrub, valley and foothill grassland. Blooms March–May. Elevation 80-305 meters.	**Not Expected.** No nearby occurrences or suitable habitat in the Study Area.
Golden larkspur (*Delphinium luteum*)	FE/CR/1B.1	Moist sites, cliffs, chaparral, coastal prairie, coastal scrub. Blooms March–May. Elevation 0-100 meters.	**Not Expected.** Nearest recent occurrence is approximately 10.9 mi away (CNDDB Occurrence #5) and is an active planting/restoration site for this species. Non-native grassland within the Study Area only provides marginal suitable habitat.
Western leatherwood (*Dirca occidentalis*)	--/--/1B.2	North or north eastern facing slopes, mixed-evergreen forest to chaparral, generally in fog belt. Blooms November–March. Elevation ranges from 50-400 meters.	**Not Expected.** Study Area not within elevation range. Wooded areas in the Study Area are not shaded enough and only provide marginal suitable habitat.
Dwarf downingia (*Downingia pusilla*)	--/--/2B.2	Vernal pools and roadside ditches. Blooms March–May. Elevation 1-445 meters.	**Low.** No occurrences within Marin County, and only marginal suitable habitat present.
Tiburon buckwheat *(Eriogonum luteolum* var. *caninum*)	--/--/1B.2	Serpentine. Blooms May–September. Elevation up to 700 meters.	**Not Expected.** No suitable habitat present within Study Area.
San Francisco wallflower (*Erysimum franciscanum* var. *crassifolium*)	--/--/4.2	Serpentine outcrops, coastal scrub or sand dunes, and granitic hillsides. Blooms March–June. Elevation ranges 0-550 meters.	**Not Expected.** No suitable habitat present within Study Area.
Minute pocket moss (*Fissidens pauperculus*)	--/--/1B.2	Damp coastal soil within conifer forests. Elevation ranges from 10-1024 meters.	**Low.** No suitable habitat within Study Area. Study Area also not within elevation range.

TABLE 1 (CONTINUED)
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE STUDY AREA

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Study Area
Plants (cont.)			
Fragrant fritillary (*Fritillaria liliacea*)	--/--/1B.2	Heavy soils on open hills and fields near the coast. Blooms from February–April. Elevation up to 400 meters.	**Moderate.** Non-native grassland on clay soils within Study Area provides suitable habitat. Two nearest recent CNDDB occurrences (#7 and #82) are 2.5 and 2.8 miles north of Study Area.
Marin checker lily (*Fritillaria lanceolata* var. *tristulis*)	--/--/1B.1	Coastal scrub, prairie and woodland. Blooms February–May. Elevation ranges from 15-150 meters.	**Low.** Study Area not within elevation range. Wooded areas and non-native grassland within Study Area only provide marginal suitable habitat.
Pitkin Marsh lily (*Lilium pardalinum ssp. pitkinense*)	FE/SE/1B.1	Cismontane woodland, freshwater marsh, swamp, meadow, seep, and wetland. Saturated, sandy soils with grasses and shrubs. Blooms June–July. Elevation ranges from 45-65 meters.	**Low.** Minimal suitable habitat in Study Area and no nearby recent occurrences.
Blue coast gilia (*Gilia capitata* subsp. *chamissonis*)	--/--/1B.1	Coastal sand hills. Blooms April–June. Elevation up to 185 meters.	**Not Expected.** No nearby recent occurrences or suitable habitat within Study Area.
Woolly-headed gilia (*Gilia capitate ssp. tomentosa*)	--/--/1B.1	Coastal bluff scrub, valley and foothill grassland. Blooms May–July. Elevation 10-220 meters.	**Not Expected.** No nearby recent occurrences or suitable habitat within Study Area.
Dark-eyed gilia (*Gilia millefoliata*)	--/--/1B.2	Stabilized coastal dunes. Blooms March–July. Elevation up to 10 meters.	**Not Expected.** No suitable habitat present within Study Area.
San Francisco gumplant (*Grindelia hirsutula* var. *maritima*)	--/--/3.2	Sandy or serpentine slopes and seas bluffs. Blooms June–September. Not recognized by the 2012 edition of the Jepson Manual. Elevation ranges from 15-400 meters.	**Not Expected.** No suitable habitat in Study Area. Has not been observed in San Pablo Bay, but is well documented within San Francisco Bay.
Diablo helianthella (*Helianthella castanea*)	--/--/1B.2	Open, grassy areas. Blooms April–June. Elevation ranges from 60-1,300 meters.	**Low.** Study Area not within elevation range. Non-native grassland within Study Area provides marginal suitable habitat.
Congested-headed hayfield tarplant (*Hemizonia congesta* subsp. *congesta*)	--/--/1B.2	Grassy sites and marsh edges. Blooms April–November. Elevation up to 100 meters.	**Moderate.** Non-native grassland within Study Area provide suitable habitat. 1994 occurrence (CNDDB occurrence #6) is within 5 miles or Study Area.
Marin western flax (*Hesperolinon congestum*)	FT/ST/1B.1	Serpentine grassland. Blooms April–August. Elevation up to 200 meters.	**Not Expected.** No suitable habitat present within Study Area.
Santa Cruz tarplant (*Holocarpha macradenia*)	FT/SE/1B.1	Clay soils in grassy areas. Blooms June–November. Elevation up to 200 meters.	**Not Expected.** Non-native grassland in Study Area provides suitable habitat. Considered possibly extirpated.
Thin-lobed horkelia (*Horkelia tenuiloba*)	--/--/1B.2	Sandy soils within open chaparral. Blooms April–July. Elevation ranges from 50-500 meters.	**Not Expected.** No suitable habitat present within Study Area.
Small groundcone (*Kopsiopsis hookeri*)	--/--/2B.3	Open woodland, mixed conifer forest, generally on *Gaultheria shallon*, and occasionally on either *Arbutus menziesii* or *Arctostaphylos uva-ursi*. Blooms April–August. Elevation ranges from 120-1,435 meters.	**Not Expected.** No suitable habitat within Study Area. Study Area also not within elevation range.

TABLE 1 (CONTINUED)
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE STUDY AREA

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Study Area
Plants (cont.)			
Contra costa goldfields (*Lasthenia conjugens*)	FE/--/1B.1	Cismontane woodland, playas, valley and foothill grassland, and vernal pools. Blooms March–June. Elevation 0-470 meters.	**Low.** Marginal suitable habitat within Study Area. Nearest recent occurrence (CNDDB occurrence 39) is 10 mi away.
Woolly-headed lessingia (*Lessingia hololeuca*)	--/--/3	Clay, sepentinite soils, coastal scrub, grassland, roadsides. Blooms June–October. Elevation from 15-305 meters.	**Low.** Marginal suitable habitat present within Study Area, but not within elevation range.
Tamalpais lessingia (*Lessingia micradenia* var. *micradenia*)	--/--/1B.2	Thin, gravelly soils of serpentine outcrops and roadcuts. Blooms July–October. Elevation from 60-305 meters.	**Not Expected.** No suitable habitat present within Study Area.
Marsh microseris (*Microseris paludosa*)	--/--/1B.2	Moist grassland and open woodland. Blooms April–June. Elevation up to 300 meters.	**Low.** Non-native grassland provides marginal suitable habitat.
Baker's navarretia (*Navarretia* leucocephala subsp. *bakeri*)	--/--/1B.1	Cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, and vernal pools. Blooms April–June. Elevation 5-1,740 meters.	**Low.** Seasonal wetlands provide marginal suitable habitat. Nearest recent occurrence (CNDDB occurrence #13) approximately 3 mi away.
Marin County navarretia (*Navarretia rosulata*)	--/--/1B.2	Rocky serpentine areas. Blooms May–July. Elevation from 200-635 meters.	**Not Expected.** No suitable habitat within Study Area. Study Area not within elevation range.
White-rayed pentachaeta (*Pentachaeta bellidiflora*)	FE/SE/1B.1	Grassy or rocky areas. Blooms March–May. Elevation up to 620 meters.	**Low.** Non-native grassland provides marginal suitable habitat. No nearby occurrences.
Hairless popcornflower (*Plagiobothrys glaber*)	--/--/1A	Wet, saline to alkaline soils in valleys and coastal marshes. Blooms March–May. Elevation up to 100 meters.	**Not Expected.** Presumed extirpated in California.
Petaluma popcornflower (*Plagiobothrys mollis* var. *vestitus*)	--/--/1A	Marshes and swamps (coastal salt), valley and foothill grassland (mesic). Blooms June–July. Elevation 10-50 meters.	**Not Expected.** Not within suitable range and no nearby recent occurrences within the Study Area.
North Coast semaphore grass (*Pleuropogon hooverianus*)	--/ST/1B.1	Wet grassy areas. Blooms March–June. Elevation up to 1,300 meters.	**Low**. Some of the seasonal wetlands in the Study Area provide suitable habitat. However, nearest recent occurrence is 6.8 mi away and relatively isolated by several mountains.
Marin knotweed (*Polygonum marinense*)	--/--/3.1	Coastal salt and brackish marshes, swamps. Blooms April–August. Elevation up to 10 meters.	**Moderate.** Tidal salt marsh provides suitable habitat. One nearby recent occurrence (CNDDB occurrence # 20) is 5.8 mi away.
Tamalpais oak (*Quercus parvula* var. *tamalpaisensis*)	--/--/1B.3	Understory of conifer woodlands. Blooms March–April. Elevation from 100-750 meters.	**Not Expected.** Study Area not within elevation range. Also, no suitable habitat within Study Area.
Lobb's aquatic buttercup (*Runuculus lobbii*)	--/--/4.2	Mesic, ponds, grasslands, vernal pools, woodlands. Blooms February–May. Elevation from 15-470 meters.	**Low.** Seasonal wetlands in Study Area provide marginal suitable habitat. However, Study Area is not within elevation range.
Point Reyes checkerbloom (*Sidalcea calycosa* subsp. *rhizomata*)	--/--/1B.2	Freshwater marshes. Blooms May–July. Elevation up to 30 meters.	**Low.** Seasonal wetlands provide marginal suitable habitat, but might be too alkaline/brackish to support this species.

TABLE 1 (CONTINUED)
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE STUDY AREA

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Study Area
Plants (cont.)			
Marin checkerbloom (*Sidalcea hickmanii* subsp. *viridis*)	--/--/1B.1	Dry ridges near coast in serpentine areas. Blooms May–June. Elevation ranges from 50-430 meters.	**Not Expected.** No suitable habitat within Study Area.
Long-styled sand spurrey (*Spergularia macrotheca* var. *longistyla*)	--/--/1B.2	Marsh, swamps, meadow, and seep. Blooms February–May. Elevation ranges from 0-220 meters.	**Low.** Tidal and diked salt marshes provide suitable habitat. However, no known occurrences in Marin county.
Sonoma alopecurus (*Alopecurus aequalis* var. *sonomensis*)	FE/--/1B.1	Freshwater marsh, riparian scrub, and wetland. Elevation ranges 3-360 meters.	**Low.** Seasonal wetlands provide marginal suitable habitat, but might be too alkaline/brackish to support this species.
Santa Cruz microseris (*Stebbinsoseris decipiens*)	--/--/1B.2	Open, sandy, shale, or serpentine areas. Blooms April–May. Elevation ranges from 10-500 meters.	**Low.** No nearby recent occurrences or suitable habitat within Study Area.
Mount Burdell jewelflower (*Streptanthus anomalus*)	--/--/1B.1	Cismontane woodland, grassy openings, and serpentinite. Blooms May–June. Elevation ranges from 50-150 meters.	**Not Expected.** This species is endemic to Mt Burdell.
Mt. Tamalpais jewelflower (*Streptanthus batrachopus*)	--/--/1B.3	Serpentine barrens and chaparral. Blooms April–July. Elevation ranges from 335-670 meters.	**Not Expected.** No suitable habitat within Study Area. Study Area also not within elevation range.
Tiburon jewelflower (*Streptanthus glandulosus* subsp. *niger*)	FE/SE/1B.1	Shallow, rocky serpentine slopes in grassland. Blooms May–June. Elevation ranges from 30-150 meters.	**Not Expected.** No suitable habitat within Study Area. Study Area also not within elevation range.
Mt. Tamalpais bristly jewelflower (*Streptanthus glandulosus* subsp. *pulchellus*)	--/--/1B.2	Dry, open grassland, chaparral, open conifer/oak woodland; occasionally on serpentine. Blooms May–August. Elevation ranges from 125-670 meters.	**Not Expected.** Study Area not within elevation range.
Suisun marsh aster (*Symphyotrichum lentum*)	--/--/1B.2	Brackish and freshwater marshes, and wetlands. Blooms May–November. Elevation ranges up to 300 meters.	**Low.** Tidal and diked salt marsh provide suitable habitat. However, no known recent nearby occurrences.
Two-fork clover (*Trifolium amoenum*)	FE/--/1B.1	Moist, heavy soils in disturbed areas, coastal bluff scrub, and grassland. Blooms April–June. Elevation ranges from 5-415 meters.	**Low.** Non-native grassland in Study Area provides marginal suitable habitat. Nearest recent occurrence is 8.2 miles away, and is relatively isolated by several mountains.
Saline clover (*Trifolium hydrophilum*)	--/--/1B.2	Salt marshes, open areas in alkaline soils. Blooms April–June. Elevation up to 335 meters.	**Low.** Tidal and diked salt marshes provide suitable habitat. However, no known occurrences in Marin county.
Pacific Grove clover (*Trifolium polyodon*)	--/CR/1B.1	Closed-cone coniferous forest, coastal prairie, meadow and seeps, valley and grassland, and wetland. Blooms April–July. Elevation ranges from 5-425 meters.	**Low.** No recent nearby occurrences and marginal suitable habitat within the Study Area.
Coastal triquetrella (*Triquetrella californica*)	--/--/1B.2	Moss. Within 10 miles of the coast. Shaded soil, rocks, sand, or gravel in dry or moist areas. Reported from trails, roadsides, picnic areas, playgrounds, and rock outcrops. Elevation up to 100 meters.	**Low.** Some of the shaded developed recreation areas provide suitable habitat. However, nearest recent occurrence (CNDDB occurrence # 9) is 11.9 mi away.

TABLE 1 (CONTINUED)
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE STUDY AREA

Status Codes:

USFWS (U.S. Fish and Wildlife Service)
- FE = Listed as Endangered by the Federal Government
- FT = Listed as Threatened by the Federal Government.
- FC = Listed as Candidate
- BCC = USFWS Bird of Conservation Concern

CDFW (California Department of Fish and Wildlife)
- SE = Listed as Endangered by the State of California
- ST = Listed as Threatened by the State of California
- CT = Candidate Threatened by the State of California
- CFP = California Fully Protected species
- SSC = Species of Special Concern
- WBWG = Western Bat Working Group

California Native Plant Society:

List 1A=Plants presumed extinct in California
List 1B=Plants rare, Threatened, or Endangered in California and elsewhere
List 2= Plants rare, Threatened, or Endangered in California but more common elsewhere
List 3= Plants about which more information is needed
List 4= Plants of limited distribution

An extension reflecting the level of threat to each species is appended to each rarity category as follows:
- .1 – Seriously endangered in California
- .2 – Fairly endangered in California
- .3 – Not very endangered in California

Potential to Occur Categories:

Absent/Not Expected = The Project and/or immediate vicinity does not support suitable habitat for a particular species. Study Area may be outside of the species' known range.
Low Potential = The Project and/or immediate vicinity only provides limited habitat. In addition, the species' known range may be outside of the Study Area.
Moderate Potential = The Project and/or immediate vicinity provides suitable habitat.
High Potential = The Project and/or immediate vicinity provides ideal habitat conditions or the species has been observed.
Present = Species has been recorded within the Study Area or immediate vicinity.

SOURCES: California Department of Fish and Wildlife (CDFW), California Natural Diversity Data Base, 2023. Available online at http://dfg.ca.gov/biogeodata/cnddb/mapsanddata.asp; California Native Plant Society, Inventory or Rare, Threatened and Endangered Plants of California, 2023. Available online at http://www.rareplants.cnps.org/; One Tam, 2018. Unpublished data; U.S. Fish and Wildlife Service (USFWS), iPac Information for Planning and Conservation. Online database powered by ECOS Environmental Conservation Online System, 2023. Available online at https://ecos.fws.gov/ipac/.