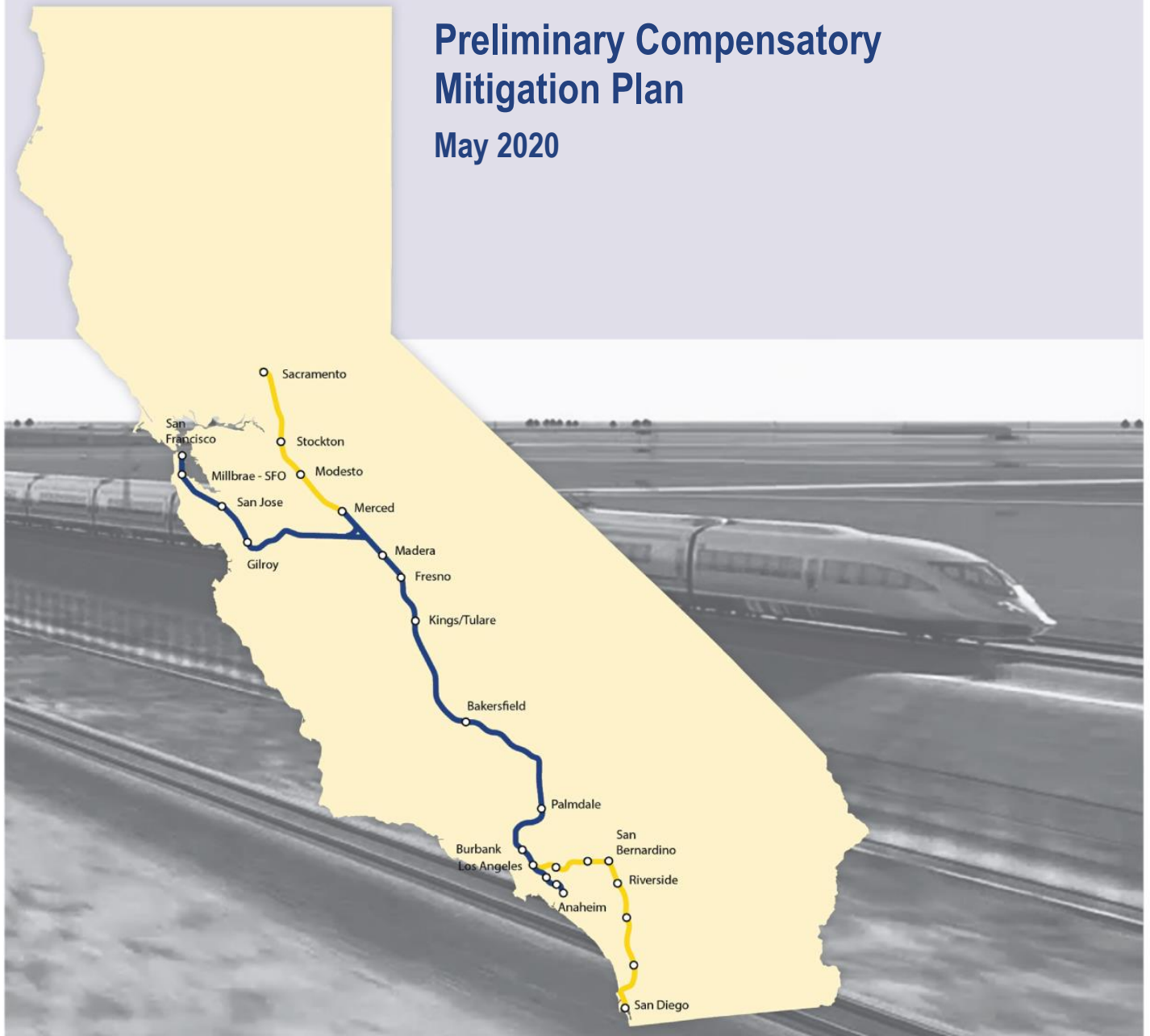


APPENDIX C: PRELIMINARY COMPENSATORY MITIGATION PLAN

California High-Speed Rail Authority

San Francisco to San Jose Project Section

Preliminary Compensatory Mitigation Plan
May 2020



The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being or have been carried out by the State of California pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated July 23, 2019, and executed by the Federal Railroad Administration and the State of California.

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ACRONYMS AND ABBREVIATIONS

Authority	California High-Speed Rail Authority
BART	Bay Area Rapid Transit
Bay Area	San Francisco Bay Area
BCDC	San Francisco Bay Conservation and Development Commission
BO	biological opinion
CEQA	California Environmental Quality Act
C.F.R.	Code of Federal Regulations
CDFW	California Department of Fish and Wildlife
CESA	California Endangered Species Act
CWA	Clean Water Act
EIR	environmental impact report
EIS	environmental impact statement
FESA	federal Endangered Species Act
Final EIS/EIR	Final Environmental Impact Statement/Report for the South Bay Salt Pond Restoration Project
FRA	Federal Railroad Administration
GIS	geographic information system
HSR	high-speed rail
HUC	hydrologic unit code
ILF	in-lieu fee
LEDPA	least environmentally damaging practicable alternative
LMF	light maintenance facility
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
NFWF	National Fish and Wildlife Foundation
NMFS	National Marine Fisheries Service
OHWM	ordinary high water mark
pCMP	preliminary compensatory mitigation plan
PRM	permittee-responsible mitigation
Project Section, project	San Francisco to San Jose Project Section
RCD	Resource Conservation District
RIBITS	Regulatory In-lieu Fee and Bank Information Tracking System
RSA	resource study area
U.S.C.	United States Code
USACE	U.S. Army Corps of Engineers

USEPA U.S. Environmental Protection Agency
USFWS U.S. Fish and Wildlife Service

1 INTRODUCTION

The California High-Speed Rail Authority (Authority) proposes to build, operate, and maintain an electric-powered high-speed rail (HSR) system in California, connecting the San Francisco Bay Area (Bay Area) and Central Valley to Southern California. When completed, the nearly 800-mile train system would provide new passenger rail service to more than 90 percent of the state's population. More than 200 weekday trains would serve the statewide intercity travel market. The system would be capable of operating speeds up to 220 miles per hour in certain HSR sections, with an automatic train control system. The California HSR System would connect and serve the state's major metropolitan areas, extending from San Francisco to Los Angeles and Anaheim in Phase 1, with extensions to Sacramento and San Diego in Phase 2.

The Authority and Federal Railroad Administration (FRA) commenced their tiered environmental planning process with the *Final Program Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Proposed California High-Speed Train System* (Statewide Program EIR/EIS) (Authority and FRA 2005). After completion of the first-tier programmatic environmental documents,¹ the Authority and FRA began preparing second-tier project environmental evaluations for sections of the statewide HSR system. Between San Francisco and San Jose, the existing Caltrain corridor was advanced for Tier 2 study. The Authority and FRA initially considered a four-track grade-separated system between San Francisco and San Jose with scoping in 2009 and alternatives analysis in 2010 and early 2011. Based on public feedback and concerns, the focus was shifted to a blended system approach for HSR and Caltrain service that would be a mostly at-grade two-track system primarily within the existing Caltrain right-of-way. Passing track options were evaluated in 2013 and 2016 and scoping was reinitiated in 2016. Additional public and stakeholder outreach was conducted from 2016 through 2018 and two alternatives were developed for detailed consideration in the environmental impact report (EIR)/environmental impact statement (EIS).

This preliminary compensatory mitigation plan (pCMP) addresses the portion of the San Francisco to San Jose Project Section (Project Section, or project) from the 4th and King Street Station in San Francisco to Scott Boulevard in Santa Clara, just north of the San Jose Diridon Station. The Project Section includes approximately 43 miles of blended² system infrastructure extending through San Francisco, San Mateo, and Santa Clara Counties with Caltrain and HSR service sharing tracks. The Project Section would also include a light maintenance facility (LMF) in Brisbane. Information from this report will be summarized in the San Francisco to San Jose Project Section Draft EIR/EIS (Draft EIR/EIS) and will be part of the administrative record supporting environmental review of the project.

Pursuant to 23 United States Code (U.S.C.) Section 327, under the National Environmental Policy Act (NEPA) Assignment Memorandum of Understanding (MOU) between the FRA and the State of California, effective July 23, 2019, the Authority is the lead agency for review of the project under NEPA and the California Environmental Quality Act (CEQA) (FRA and State of California 2019). The U.S. Army Corps of Engineers (USACE) and the federal Surface Transportation Board are serving as cooperating agencies under NEPA for the project.

1.1 Purpose of the Preliminary Compensatory Mitigation Plan

The primary purpose of this pCMP is to illustrate the availability of lands to meet compensatory mitigation needs for offsetting the project's impacts on waters of the U.S. regulated under Section 404 of the federal Clean Water Act (CWA). The secondary purpose of this report is to identify

¹ Two program-level environmental documents were prepared: the Statewide Program EIR/EIS (Authority and FRA 2005) and the *Bay Area to Central Valley High-Speed Train Final Program Environmental Impact Report/Environmental Impact Statement (EIR/EIS)* (Authority and FRA 2008). These documents evaluated the impacts of proposed HSR corridors and selected the HSR sections comprising the California statewide system.

² *Blended* refers to operating the HSR trains with existing intercity, commuter, and regional rail trains on common infrastructure.

initial approaches to meet compensatory mitigation needs for offsetting impacts on species listed under the federal Endangered Species Act (FESA).

This pCMP supports the Checkpoint C Report, as described in the *Memorandum of Understanding: National Environmental Policy Act (42 U.S.C. 4321 et seq.) and Clean Water Act Section 404 (33 U.S.C. 1344) and Rivers and Harbors Act Section 14 (33 U.S.C. 408) Integration Process for the California High-Speed Train Program* (NEPA/404/408 MOU) (FRA et al. 2010).

The purpose of the MOU and the checkpoint process is to facilitate compliance with NEPA, CWA Section 404 (33 U.S.C. § 1344) and Rivers and Harbors Act Section 14 (33 U.S.C. § 408) processes for the project-level (Tier 2) EISs for the sections of the proposed HSR system. Integrating these processes is intended to expedite decision making at the planning and permitting stages while improving the overall quality of those decisions. This pCMP supports those processes by identifying potential approaches to mitigation for discharges associated with the Preferred Alternative.

This pCMP integrates the mitigation requirements of the CWA and FESA into a comprehensive plan that demonstrates mitigation is feasible for anticipated unavoidable impacts on regulated waters and listed federal species. Consistent with Section 404 compensatory mitigation guidelines described in Section 2.4, Regional and Watershed Approach to Mitigation, the compensatory mitigation strategy prioritizes options that are within the same watershed as the impacts. Also, consistent with the guidelines, the compensatory mitigation strategy will likely include mitigation and conservation banks, permittee-responsible mitigation (PRM). For species mitigation, the geographic boundaries within which mitigation should occur is biologically relevant and species-specific as described in Section 3.4, Compensatory Mitigation Strategy.

The compensatory mitigation approach will undergo further development and refinement as the Authority works with the resource agencies to complete the compensatory mitigation planning process. As this planning progresses, and following publication of the Draft EIR/EIS, and continued agency coordination, the pCMP will be used as the basis for developing the Draft Compensatory Mitigation Plan for waters and wetlands, and the Draft Mitigation Plan for species. Pursuant to the NEPA/404/408 MOU (FRA et al. 2010), the Draft Compensatory Mitigation Plan for waters and wetlands shall include the following elements:

- Objectives
- Site or credit selection
- Baseline information on the proposed mitigation site(s)
- Determination of credits
- Mitigation work plan
- Maintenance plan
- Performance standards
- Monitoring requirements
- Long-term management plan
- Mitigation assurances

When PRM is proposed the Draft Compensatory Mitigation Plan shall document the results of surveys and research conducted for each potential PRM site, including:

- Reconnaissance-level biological surveys
- Delineations of potentially jurisdictional waters of the U.S., including wetlands
- California Rapid Assessment Method surveys
- Property title searches (e.g., liens, easements, encumbrances)

Once the Draft Compensatory Mitigation Plan has been completed and approved by the applicable resource agencies, the Authority will prepare the Final Compensatory Mitigation Plan for the subset of mitigation options carried forward from the Draft Compensatory Mitigation Plan. The Final Compensatory Mitigation Plan documents a variety of additional site-specific studies and research, including:

- Restoration and enhancement plan (PRM site[s])
- Grading plan (PRM site[s])
- Planting plan (PRM site[s])
- Short-term financial assurances (bond, letter of credit, escrow account for 5-year maintenance and monitoring period) (PRM site[s])
- Property analysis report (long-term management costs/endowment) (PRM site[s])
- Conservation easement (PRM site[s])
- Long-term management plan (PRM site[s])
- Agreement(s) with mitigation bank(s), conservation bank(s), and in-lieu fee (ILF) program(s) (Bank/ILF credit purchases)
- Hydrologic study (may not be required)³

With respect to planning and permitting milestones, it is anticipated that the Draft Compensatory Mitigation Plan, which will contain the necessary components outlined in the MOU, will be submitted to the USACE with the permit application, and submittal of the Final Compensatory Mitigation Plan will be necessary to receive a permit from the USACE.

1.2 Preliminary Compensatory Mitigation Plan Objectives

This pCMP identifies and evaluates a range of compensatory mitigation options that would be sufficient to offset permanent, unavoidable losses to resources regulated under Section 404 of the CWA and achieve “no net loss” of wetlands. Compensatory mitigation options evaluated and presented in the pCMP include:

- Mitigation or wetland banks
- ILF programs
- Conservation banks (federally listed species)
- PRM, which includes creation, restoration, enhancement and protection

Waters and wetlands mitigation options occur within the same eight- or ten-level hydrologic unit code (HUC-8 or HUC-10) as the impact, to the greatest extent possible.

1.3 Overview of the San Francisco to San Jose Project Section

The Project Section would provide HSR service between San Francisco and San Jose as part of the statewide HSR system. HSR stations would be located at 4th and King Street⁴ in San Francisco and at Millbrae. HSR service would share tracks with Caltrain along approximately 43 miles of blended system infrastructure primarily within the existing Caltrain right-of-way, through urban cities and communities in San Francisco, San Mateo, and Santa Clara Counties, including San Francisco, Brisbane, South San Francisco, San Bruno, Millbrae, Burlingame, San Mateo, Belmont, San Carlos, Redwood City, North Fair Oaks, Atherton, Menlo Park, Palo Alto, Mountain

³ The need for a hydrologic study is contingent on the nature of the proposed PRM site improvements. For example, an upland native plant restoration project would not require a hydrologic study if it would not affect hydrology.

⁴ The 4th and King Street Station would serve as an interim station until completion of the proposed Downtown Extension Project (DTX). The DTX would extend the electrified peninsula rail corridor in San Francisco from the 4th and King Street Station to the Salesforce Transit Center (SFTC). HSR would utilize the track constructed for the DTX to reach the SFTC.

View, Sunnyvale, and Santa Clara. The Project Section is divided into the following four geographic subsections: San Francisco to South San Francisco, San Bruno to San Mateo, San Mateo to Palo Alto, and Mountain View to Santa Clara, and would include an LMF.

1.4 Overview of Preliminary Least Environmentally Damaging Practicable Alternative

Following an intensive alternatives development process and comprehensive environmental review of two project alternatives, the Authority selected Alternative A (illustrated on Figure 1) as the Preliminary least environmentally damaging practicable alternative (LEDPA). The Preliminary LEDPA would have a less adverse impact on jurisdictional waters than the other project alternative, is consistent with the overall project purpose, and is available and capable of being done. In addition, the Preliminary LEDPA would have less impact on other environmental resources. The screening and selection process are detailed in the *San Francisco to San Jose Project Section: Staff-Recommended Preferred Alternative Staff Report* (Authority 2019a). The Authority has requested concurrence from the USACE and U.S. Environmental Protection Agency (USEPA) with selection of Alternative A as the Preliminary LEDPA. The determination was based on the following considerations:

- Impact on jurisdictional waters
- Impact on other environmental resources
- Practicability as defined in the Section 404(b)(1) Guidelines, including consistency with the overall project purpose

The Preliminary LEDPA would modify approximately 14.5 miles of existing Caltrain track predominantly within the existing Caltrain right-of-way, install safety improvements and communication radio towers, modify seven existing Caltrain stations or platforms to accommodate HSR, and build the East Brisbane LMF. Caltrain has several four-track segments where trains can pass; no additional passing tracks would be built under the Preliminary LEDPA.

HSR stations would be located at the existing 4th and King Street and Millbrae Stations. The existing 4th and King Street Station would serve as the interim terminal station for the Project Section until the Downtown Extension Project provides HSR access to the Salesforce Transit Center. Station improvements at the 4th and King Street Station would be limited to installing a booth for HSR ticketing and support services, adding HSR fare gates, and modifying existing tracks and platforms. At the Millbrae Station, new HSR station facilities including a station hall for ticketing and support services would be built on the west side of the existing Caltrain corridor. A new overhead crossing would extend from the station hall to the existing station concourse, providing access to the new HSR tracks and platforms west of the existing Caltrain/Bay Area Rapid Transit (BART) platform. Multimodal station access improvements, including curbside pick-up and drop-off areas, would be provided along El Camino Real and the extension of California Drive. Replacement parking for displaced Caltrain and BART commuter parking would be west of the station along El Camino Real west of the station along El Camino Real.

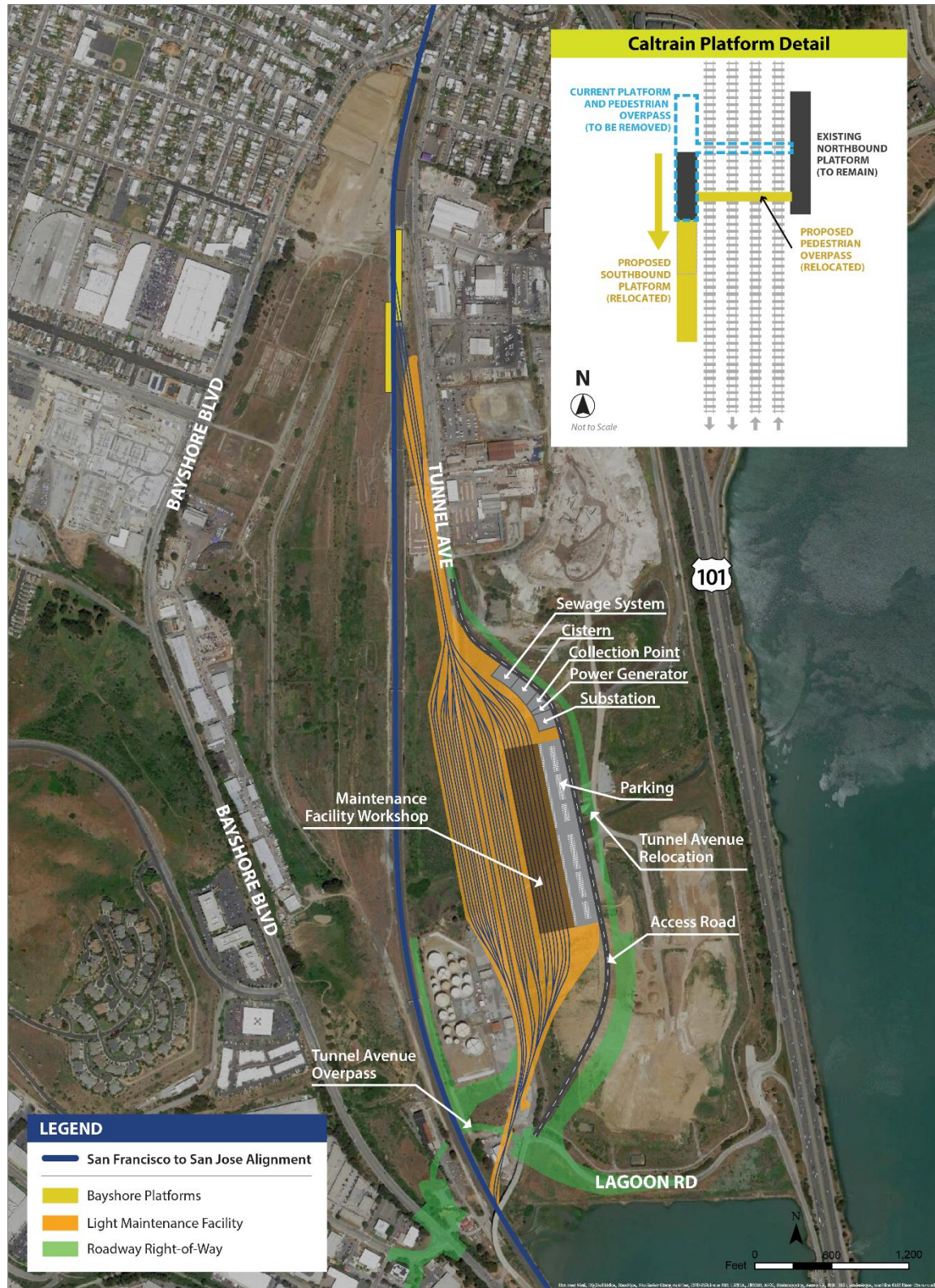
The East Brisbane LMF (illustrated on Figure 2) would be built on approximately 100 acres of predominantly vacant lands east of the Caltrain corridor. Direct HSR mainline track access would be provided along double-ended yard leads that would cross over the mainline track on an aerial flyover and would enable north and south movements. The East Brisbane LMF would include a maintenance yard with 17 yard tracks adjacent and parallel to a maintenance building containing eight shop tracks with interior access and inspection pits for underside and truck inspections. The maintenance building would provide storage areas for reserve equipment, workshops, and office space. An access road would connect the facility to Tunnel Avenue, which would be realigned east of the LMF.



Source: Authority 2019b

NOVEMBER 2019

Figure 1 Preliminary LEDPA (Alternative A)



Source: Authority 2019b

NOVEMBER 2019

Figure 2 East Brisbane Light Maintenance Facility (Alternative A)

2 WATERS OF THE UNITED STATES

2.1 Overview of Laws and Regulations

2.1.1 Section 404 Clean Water Act (33 U.S.C. § 1251 et seq.)

The federal CWA is the primary federal law protecting the quality of the nation’s surface waters, including wetlands. This pCMP sets forth compensatory mitigation for impacts regulated under Section 404 of the CWA. Under Section 404, the USACE regulates the discharge of dredged and fill materials into waters of the U.S., for which project proponents must obtain a permit from the USACE.⁵

2.1.2 Protection of Wetlands (USEO 11990)

U.S. Presidential Executive Order 11990 aims to avoid direct or indirect impacts on wetlands from federal or federally approved projects when a practicable alternative is available. If wetland impacts cannot be avoided, all practicable measures to minimize impacts must be included.

2.1.3 2008 Final Rule (33 C.F.R. Part 332)

In 2008, USACE promulgated the *Compensatory Mitigation for Losses of Aquatic Resources: Final Rule* (33 Code of Federal Regulations [C.F.R.] Part 332), which established compensatory mitigation requirements under Section 404 of the CWA. As codified, the 2008 Final Rule states (33 C.F.R. § 332.3) that compensatory mitigation may be achieved using restoration, enhancement, establishment, and in certain circumstances preservation. The Final Rule prioritizes restoration as the preferred mitigation method because it is typically most successful, has fewer upland impacts than establishment, and adds greater value in terms of aquatic resource function than enhancement or preservation.

Preservation may be used when all the following criteria are met (33 C.F.R. § 332.3(h)):

- I. The resources to be preserved provide important physical, chemical, or biological functions for the watershed;
- II. The resources to be preserved contribute significantly to the ecological sustainability of the watershed. In determining the contribution of those resources to the ecological sustainability of the watershed, the district engineer must use appropriate quantitative assessment tools, where available;
- III. Preservation is determined by the district engineer to be appropriate and practicable;
- IV. The resources are under threat of destruction or adverse modifications; and
- V. The preserved site will be permanently protected through an appropriate real estate or other legal instrument (e.g., easement, title transfer to state resource agency or land trust).

Additionally, where preservation is used, it is generally required to be done in conjunction with aquatic resource restoration, establishment, and/or enhancement activities (33 C.F.R. § 332.3(h)).

⁵ All waters of the U.S. are also waters of the State of California, and are subject to State permitting and compensatory mitigation requirements not discussed in this pCMP.

The 2008 Final Rule identifies three mechanisms for providing compensatory mitigation: PRM,⁶ mitigation banks, and ILF mitigation. The regulation prioritizes (33 C.F.R. § 332.3(b)), from highest to lowest, use of:

1. Mitigation banks
2. ILF programs
3. PRM under a watershed approach
4. PRM through on-site and in-kind mitigation
5. PRM through off-site or out-of-kind mitigation, or both

2.1.4 U.S. Army Corps of Engineers Mitigation Ratio Guidelines

The USACE South Pacific Division released *Standard Operating Procedures for Determination of Mitigation Ratios* (SOP) in 2013 (USACE 2013) to establish compensatory mitigation ratios for unavoidable impacts on aquatic resources, applicable to CWA Section 404, Section 10 of the Rivers and Harbors Act, and Section 103 of the Marine Protection, Research, and Sanctuaries Act. Pursuant to the SOP, the USACE develops mitigation proposals and ratios and documents its decision-making process in the permitting action administrative record. The SOP generally includes the six following scoring factors that influence the development of mitigation-to-impact ratios for resources regulated by the USACE under Section 404:

- Change in condition/function/value of waters of the U.S. (SOP Sections 2 and 3)
- Change in location of waters of the U.S. (SOP Section 4)
- Change in surface area of waters of the U.S. (SOP Section 5)
- Change in type of waters of the U.S. (SOP Section 6)
- Uncertainty of mitigation success of waters of the U.S. (SOP Section 7)
- Temporal loss of function of waters of the U.S. (SOP Section 8)

2.1.5 Regional Compensatory Mitigation and Monitoring Guidelines for the South Pacific Division

In 2015, the South Pacific Division of the USACE published the *Regional Compensatory Mitigation and Monitoring Guidelines for the South Pacific Division* (SPD Guidelines) (USACE 2015). The SPD Guidelines provide guidance for selecting appropriate compensatory mitigation sites and preparing mitigation plans to compensate for unavoidable impacts on waters of the U.S. The SPD Guidelines are also intended to standardize compensatory mitigation procedures throughout the South Pacific Division region, and to assist the regulated public in preparing mitigation plans and in implementing successful compensatory mitigation projects using a watershed-based approach (USACE 2015). Final mitigation requirements are determined through consultation with the district engineer in coordination with state and federal resource agencies and may vary depending on the nature of project impacts.

2.2 Estimated Impacts on Waters of the U.S.

Construction of the Preliminary LEDPA would result in permanent and temporary impacts through the disturbance or removal of lands that have been determined to support or that could potentially support jurisdictional waters of the U.S. as defined under CWA Section 404. Appendix A, Impacts

⁶ PRM is defined in 33 C.F.R. Part 332 as “an aquatic resource restoration, establishment, enhancement and/or preservation activity undertaken by the permittee to provide compensatory mitigation for which the permittee retains full responsibility.”

on Waters of the U.S. Maps, illustrates the locations of all waters of the U.S. that the project footprint intersects.

Jurisdictional waters of the U.S. include *wetlands* and *nonwetland waters*. Wetland types identified within the aquatic resource study area (RSA) are freshwater emergent wetland, saline emergent wetland, and scrub/shrub wetland.

Nonwetland waters identified in the aquatic RSA are constructed basin, constructed watercourse, natural watercourse, and open water. All natural and constructed waterways are considered potentially jurisdictional under the Preliminary Jurisdictional Delineation format (USACE 2008).

The modification of track and stations, modification of roadways, construction of station facilities and the LMF, and associated infrastructure would permanently remove or alter or would temporarily affect waters of the U.S. through filling, hydrological interruption, or other means of disturbance. In the case of artificial or constructed aquatic features (e.g., constructed basins), these impacts would remove or disrupt the limited biological functions these features provide. In natural areas, these activities would remove or disrupt the hydrology, vegetation, wildlife utilization, water quality conditions, and other biological functions the jurisdictional waters provide.

For the purposes of this pCMP, permanent and temporary impacts are defined as follows:

- **Permanent**—Project activities that would either permanently alter land cover from its existing condition or that would be of long-term duration (more than 1 year).
- **Temporary**—Project activities with a duration of 1 year or less that would result in temporary disturbance to existing land cover. Affected areas would be restored to pre-disturbance conditions after work is completed.

Permanent and temporary impacts shown in Table 1 were calculated using geographic information system (GIS) software. Specifically, GIS analysts calculated impact acreages by intersecting aquatic resource feature layers with feature layers in the project design drawings (i.e., project activities). For the purpose of this analysis, it is conservatively assumed that all waters of the U.S. within the project footprint would be affected. Actual impacts are anticipated to be less because of opportunities for avoidance provided by design refinements and construction planning. In addition to this, for mitigation planning purposes, the impacts associated with areas that would be restored to pre-project conditions after more than 1 year have been conservatively treated as permanent. The classification of these impacts would be reassessed during refinement of the project design.

Table 1 Estimated Impacts on Waters of the U.S. (acres)

Waters of the U.S.	San Francisco Bay HUC-8			Coyote HUC-8 Watershed			Grand
	Permanent	Temporary	Total	Permanent	Temporary	Total	
Wetlands							
Freshwater emergent wetland	1.8	1.9	3.7	0.0	0.0	0.0	3.7
Saline emergent wetland	1.7	0.0	1.7	0.0	0.0	0.0	1.7
Scrub/shrub wetland	0.3	0.4	0.7	0.0	0.0	0.0	0.7
<i>Subtotal Wetlands</i>	<i>3.8</i>	<i>2.3</i>	<i>6.1</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>6.1</i>
Nonwetland Waters							
Constructed basin	0.2	0.2	0.4	0.0	0.0	0.0	0.4
Constructed watercourse	3.2	0.3	3.5	0.7	0.0	0.7	4.2
Natural watercourse	0.2	0.2	0.4	0.2	0.0	0.2	0.6

Waters of the U.S.	San Francisco Bay HUC-8 Watershed			Coyote HUC-8 Watershed			Grand Total
	Permanent	Temporary	Total	Permanent	Temporary	Total	
Open water	0.5	0.0	0.5	0.0	0.0	0.0	0.5
<i>Subtotal Nonwetlands</i>	<i>4.1</i>	<i>0.7</i>	<i>4.8</i>	<i>0.9</i>	<i>0.0</i>	<i>0.9</i>	5.7
Total	7.9	3.0	10.9	0.9	0.0	0.9	11.8

HUC = hydrological unit code

2.2.1 Wetlands

Wetlands in the aquatic RSA were delineated using the methods described in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coasts Region* (Supplement) (USACE 2010), and the wetland plant indicator status list (Lichvar et al. 2012, 2014, 2016).

The project would affect three wetland types: freshwater emergent wetland, saline emergent wetland, and scrub/shrub wetland. Freshwater emergent wetlands are scattered throughout the project footprint but are most common in and near Brisbane. Saline emergent wetlands occur in a 1.7-mile stretch of the northern portion of the Project Section along Guadalupe Valley Creek near where it flows into Brisbane Lagoon, along the northeastern margin of Brisbane Lagoon, and along the edge of the Caltrain right-of-way near Oyster Point. The saline emergent wetlands are in the existing Caltrain right-of-way and are therefore inside the project footprint, but it is expected that they could be avoided during construction. Scrub/shrub wetland consisting primarily of arroyo willow (*Salix lasiolepis*) occurs at the East Brisbane LMF site in Brisbane.

The modification and construction of track, stations, and associated infrastructure would remove or alter wetlands through filling, hydrological interruption, or other means of disturbance. Most impacts would occur from construction of the LMF. Construction of the East Brisbane LMF would result in the conversion and degradation of aquatic resources by relocating a portion of Visitacion Creek and filling several freshwater emergent and scrub/shrub wetlands. Impacts would also result from the construction of new bridges or culverts for the railbed, roadways, and other infrastructure to cross over watercourses, or the modification of existing bridges and culverts for the same purpose, such as the realigned of the Tunnel Avenue overpass at the northwestern corner of Brisbane Lagoon. For more information on methods and results of the delineation, see the *San Francisco to San Jose Project Section Aquatic Resources Delineation Report* (Aquatic Resources Delineation Report) (Authority 2020b). Estimated impacts on wetlands as well as nonwetland waters are summarized in Table 1.

2.2.2 Nonwetland Waters

Nonwetland waters in the aquatic RSA were delineated based on indicators for the ordinary high water mark (OHWM) following criteria outlined in USACE Regulatory Guidance Letter No. 05-05, *Ordinary High Water Mark Identification* (USACE 2005) using global positioning system units at all potential jurisdictional features that were physically accessible. As a result, biologists primarily identified the OHWM on the basis of two physical hydrologic indicators—topographic break in slope and changes in sediment characteristics—both of which are more pronounced in constructed features. Other secondary hydrologic indicators such as watermarks (staining) and sediment deposits, were also used to identify the OHWM. Fieldwork was conducted in 2009, 2010, 2013, 2014, 2018, and 2020. For more information on methods and results of the delineation see the Aquatic Resources Delineation Report (Authority 2020b).

The project would affect four types of nonwetland waters: constructed basin, constructed watercourse, natural watercourse, and open water. The constructed basins consist of two stormwater basins at the East Brisbane LMF site. Both appear to have year-round, or nearly year-round standing water. Constructed watercourses consist of channelized or engineered

watercourses with concrete or sackcrete-lined channels that lack natural beds and banks on one or both sides and are distributed relatively evenly throughout the project footprint. Natural watercourses are distributed throughout the project footprint and are comprised of named creeks—Guadalupe Valley Creek, Mills Creek, San Mateo Creek, Borel Creek, Belmont Creek, Cordilleras Creek, San Francisquito Creek, and Stevens Creek. Open water consists of Brisbane Lagoon, which is an estuary that receives tidal action from the bay and parallels the project footprint south of the LMF site, China Basin, and the Islais Creek channel.

The modification and construction of track, stations, and associated infrastructure would remove or alter nonwetland waters through filling, hydrological interruption, or other means of disturbance. Construction of the East Brisbane LMF would relocate a portion of Visitacion Creek. The project would require construction of new bridges or culverts for the railbed, roadways, and other infrastructure to cross over watercourses, or the modification of existing bridges and culverts for the same purpose. To complete this work, the contractor may need to perform minor trimming of vegetation or other activities in or near wetlands or nonwetland waters that cross below or run parallel to the railbed. Some of this work may need to be conducted from within these features. Temporary stream diversions would be needed to conduct the work within perennial watercourses. Estimated impacts on nonwetland waters are summarized in Table 1.

2.3 Confirmation of Impacts

In coordination with the USACE, the permitted discharges to waters of the U.S. would be confirmed during project construction. If discharges to waters of the U.S. are less than anticipated in the permit because of changes in project design, adjustments to the amount of compensatory mitigation would be made accordingly.

2.4 Regional and Watershed Approach to Mitigation

As defined in the 2008 Final Rule (33 C.F.R. § 332.2), the watershed approach is:

“...an analytical process for making compensatory mitigation decisions that support the sustainability or improvement of aquatic resources in a watershed. It involves consideration of watershed needs, and how locations and types of compensatory mitigation projects address those needs. A landscape perspective is used to identify the types and locations of compensatory mitigation projects that will benefit the watershed and offset losses of aquatic resource functions and services caused by activities authorized by DA permits. The watershed approach may involve consideration of landscape scale, historic and potential aquatic resource conditions, past and projected aquatic resource impacts in the watershed, and terrestrial connections between aquatic resources when determining compensatory mitigation requirements for DA permits.”

The 2008 Final Rule requires use of a watershed approach to establish compensatory mitigation requirements to the extent appropriate and practicable (33 C.F.R. § 332.3(c)). If available, a watershed plan should be used to guide the watershed approach. Where no such plan is available, the watershed approach should be based on other available sources.

The project would have impacts within two watershed boundaries as defined by U.S. Geological Survey HUC-8: San Francisco Bay (18050004) and Coyote (18050003). This pCMP proposes that compensatory mitigation occur within the same HUC-8 boundary where the impact would occur to the extent practicable. This project also proposes to use available watershed plans and existing restoration programs to guide compensatory mitigation needs.

The project’s compensatory mitigation strategy would apply several key principles to selecting and prioritizing the final mitigation package. These principles are as follows:

- Prioritize conservation or mitigation banks within the affected HUC-8 watershed boundary over those outside the affected HUCs.
- Identify properties that can serve as mitigation for multiple resources. For example, freshwater wetland creation or restoration on a PRM site could serve as mitigation under

Section 404 as well as mitigation for impacts on California red-legged frog breeding habitat under FESA.

- Prioritize large properties for PRM sites. Larger properties have an increased ecological value because *edge impacts*—such as invasive species introduction or human-related disturbance, that occur at the edge of the property where adjoining properties are not managed or protected—can negatively affect habitat quality.
- Prioritize PRM sites that are adjacent to existing conservation lands, helping to reduce edge impacts and increasing the functional value for species with larger home ranges.
- Select PRM sites that are within known wildlife movement corridors, connect discontinuous movement corridors, and protect land near wildlife crossing features along the alignment.
- Seek partnerships with existing conservation organizations to purchase and manage PRM sites as well as to identify establishment, restoration, and enhancement opportunities on existing protected lands.
- Prioritize lands that are within designated critical habitat or core recovery planning units.

In addition, the mitigation strategy would be consistent with guidance from USACE staff as well as published guidance documents. USACE mitigation guidance documents are summarized in Section 2.1, Overview of Laws and Regulations.

2.5 Process for Identification of Compensatory Mitigation Options

This section describes the approach to mitigating unavoidable impacts on jurisdictional waters, and the identification of options for providing such mitigation. Analysts followed the following steps:

1. Identified types of potential impacts by resource type and location—the estimated impacts by resource (described in Section 2.2, Estimated Impacts on Waters of the U.S.), together with the geographic boundaries of the San Francisco Bay and Coyote watersheds, set the parameters for where potential compensatory mitigation project would be sought.
2. Evaluated mitigation banks and ILF programs with service areas overlapping the San Francisco Bay and Coyote watersheds, by using USACE’s Regulatory In-Lieu Fee and Bank Information Tracking System (RIBITS) (USACE 2019). The available wetland credit types, as described in RIBITS, were cross-referenced with the affected land cover types.
3. Considered conceptual mitigation approaches for on-site restoration near the East Brisbane LMF.
4. Identified potential programs, and partners that could provide compensatory mitigation for those impacts on waters of the U.S. that could not be met through a mitigation bank or ILF program, or on-site restoration. Analysts reviewed applicable watershed plans and identified local agencies currently undertaking restoration activities for the potentially affected resources. Analysts then contacted certain local agencies to gauge level of interest and opportunity for a possible partnership for establishment, enhancement, or restoration activities. Wetlands and nonwetland waters could be established, restored, or enhanced and protected as PRM sites. This PRM would likely include a combination of turnkey projects, restoration and enhancement activities on conserved lands, or other types of partnerships with local and regional conservation organizations.

2.6 Compensatory Mitigation Options

Because there are not sufficient mitigation banks or ILF programs available to address the likely mitigation needs for all of the types of waters of the U.S. into which fill would be placed, some PRM would be required. This pCMP proposes that a combination of mitigation bank credit purchase, on-site restoration, and off-site restoration would be used to satisfy mitigation requirements under Section 404. This approach would address both temporary impacts and permanent impacts. The following sections describe the compensatory mitigation options.

2.6.1 On-Site Compensatory Mitigation

On-site compensatory mitigation is a form of PRM and is the planned mitigation for temporary impacts relating to all aquatic resources. Based on USACE guidance, fill placed within jurisdictional waters for less than 1 year is considered a temporary impact. All temporary construction areas would be returned to pre-project contours and revegetated. With respect to wetlands, temporary impacts would be addressed in a manner most appropriate for the affected resource. For example, to promote reestablishment of wetland conditions in temporary construction areas, the topsoil may be removed and stockpiled during construction and then returned to the disturbed areas and revegetated following construction activities. Site-specific avoidance measures would be developed as project details become known.

On-site compensatory mitigation is also planned to offset permanent impacts on constructed watercourse and constructed basin aquatic land cover types throughout the Project Section. Constructed features that are permanently affected would be restored or replaced in kind either on-site or adjacent to the project footprint. Restoration and replacement would be undertaken in coordination with the landowner or operator of the constructed feature to determine what course of action should be taken for each constructed feature and to maintain the water conveyance or storage function. Three basic outcomes or scenarios could occur at each constructed feature:⁷

1. The constructed feature is currently used for conveyance or water storage and the current functions and storage capacity are still required. The capacity and function would be restored on-site through the creation of a new or modified (expanded) feature adequate to meet the design function.
2. A constructed feature is not currently used for water storage or conveyance but provides aquatic resource functions. The aquatic resource functions would be mitigated through off-site restoration or enhancement.
3. The constructed basin is not currently used for water storage or conveyance and is not providing aquatic resource functions; no restoration of the feature and no on-site or off-site mitigation would be proposed.

The Authority, in coordination with owner or operator of the constructed feature, would come to an agreement on which course of action would be taken and communicate that decision for each affected feature to the USACE before affecting the features. All work affecting constructed features would be coordinated with the owner or operator of the constructed feature. Written demonstration of acceptancy by the owner or operator would be provided to the USACE.

On-site compensatory mitigation may also be proposed to offset permanent impacts on wetland and nonwetland aquatic features associated with the East Brisbane LMF. This proposed LMF site is bisected by Visitacion Creek, a tidally influenced creek. The Authority is seeking a San Francisco Bay Conservation and Development Commission (BCDC) permit, and as part of that process, is exploring a potential Visitacion Creek/Bay resiliency mitigation concept to address some, or potentially all, of the mitigation needs for impacts at or adjacent to the proposed East Brisbane LMF.

The Visitacion Creek/Bay resiliency mitigation concept is a mitigation strategy that would also require a permit from BCDC due to the filling of Visitacion Creek, but on a rationale more consistent with BCDC policies and values as adopted in the *San Francisco Bay Plan* (BCDC 2008). As shown in Exhibit 1 of Appendix B, Potential Visitacion Creek/Bay Resiliency Mitigation Concept, the concept proposes rerouting Visitacion Creek from where it daylight just east of the Caltrain tracks to the south rather than east to under U.S. Highway 101, and to terminate at the Brisbane Lagoon rather than at San Francisco Bay. The existing channel would still need to be filled; however, this approach would avoid culverting a channel under the widest point of the LMF

⁷ A fourth scenario may exist in the event that a constructed feature is no longer required by the owner or operator. However, in the event that this scenario arises, compensatory mitigation would still need to be identified to satisfy CWA mitigation requirements, as the constructed water feature would still be regulated under Section 404 of the CWA.

and provide a more open channel which may be more desirable to the community and to BCDC because it would best advance the policies in the Bay Plan. The rerouted creek would be open air with one rail and two vehicular bridges spanning over the creek, as opposed to a multiple-track configuration. Appendix B, Exhibit 2 shows a proposed cross section of the creek. The realigned creek would model the existing creek profile and cross section and would maintain the tidal gate just east of the existing Caltrain tracks. The creek would flow as a tidally influenced channel into Brisbane Lagoon. Based on Appendix B, and assuming saltwater marsh and freshwater emergent wetland plants would be planted mid-slope along the length of the constructed channel, it can be estimated that the proposed design would result in approximately 2,000 linear feet (0.38 mile) of channel, 2.6 acres of constructed watercourse, and 2.6 acres of saline emergent wetland and freshwater emergent wetland. The amount of each wetland type ultimately replaced would, however, depend on how far tidal influence reaches up the constructed channel. Preliminary hydrologic and hydraulic analysis of the mitigation concept suggests that it is feasible and implementable.

2.6.2 Off-Site Compensatory Mitigation

2.6.2.1 In-Lieu Fee Programs

There are no existing ILF programs with service areas overlapping the RSA. However, informal conversations between the National Fish and Wildlife Foundation (NFWF) and Authority permitting staff indicate that NFWF holds a limited number of unallocated mitigation credits for stream impacts. In the event that NFWF unallocated credits could be used to compensate for project impacts, an ILF program could provide a potential mitigation option.

2.6.2.2 Mitigation Banks

Based on RIBITS searches (USACE 2019) as well as outreach through stakeholders and third-party mitigation providers, one mitigation bank is currently available with a service area overlapping the San Francisco Bay HUC-8 watershed—the San Francisco Bay Wetland Mitigation Bank. This bank is primarily used for tidal wetland and other waters (including tidal sloughs and other tidal open water areas). It could potentially provide credits for nontidal/seasonal wetland and other waters on a case-by-case basis where the impacts on nontidal/seasonal wetlands or other waters may have been historic tidal wetlands or other waters. As of January 2, 2019, RIBITS notes that this bank has 15.6 acres of wetland credit available, and 0.35 acre of tidal/other waters of the U.S. Contingent on approval by USACE, credits from this bank could be used to mitigate for impacts on saline emergent wetland, and potentially on freshwater emergent wetland and scrub/shrub wetland. There are no mitigation banks that serve the Coyote HUC-8 watershed, which stops short of the tidal areas of the San Francisco Bay.

2.6.2.3 Permittee-Responsible Mitigation

Mitigation needs that are not met by on-site compensatory mitigation or through mitigation banks will require PRM. Off-site PRM opportunities in the HUC-8 watersheds affected by the project could include projects developed through a partnership with one or more of the open-space or parkland management agencies in the region, or through financial contributions to ongoing restoration efforts. Several potential mitigation partners acquire or manage lands within the same watersheds as the project alignment. These potential partners and associated mitigation options are summarized in Table 2.

Table 2 Off-Site Permittee-Responsible Mitigation Options to Offset Project Impacts

Potential Off-Site Permittee-Responsible Mitigation Partner	Applicable HUC-8 Watershed	Land Cover Types with Mitigation Potential	Mitigation Action under Consideration
East Bay Regional Park District	San Francisco Bay, HUC 18050004	Freshwater emergent wetland, scrub/shrub wetland, saline emergent wetland, constructed watercourse, natural watercourse	Protection, restoration and enhancement
Midpeninsula Regional Open Space District	San Francisco Bay, HUC 18050004	Freshwater emergent wetland, scrub/shrub wetland, natural watercourse	Protection, restoration, and enhancement
Peninsula Open Space District	San Francisco Bay, HUC 18050004	Freshwater emergent wetland, scrub/shrub wetland, natural watercourse	Protection, restoration, and enhancement
South Bay Salt Pond Restoration Program	San Francisco Bay, HUC 18050004	Saline emergent wetland	Restoration and enhancement
San Francisquito Creek Joint Powers Authority	Coyote Creek, HUC 18050003	Scrub/shrub wetland, natural watercourse	Restoration and enhancement

Sources: Andersen 2019; Barton 2020; Halsing 2019; Murray 2019
 HUC = hydrologic unit code

The Authority reached out to each potential PRM partner in Table 2 and confirmed that they are willing to discuss a partnership to implement mitigation projects. The Authority also reached out to the San Francisco International Airport regarding possible opportunities at its West-of-Bayshore property and the California Coastal Conservancy regarding opportunities at the Bel Marin Keys Wetland Restoration Project in Marin County. No opportunities for mitigation partnership are available at these sites.

However, the degree to which these PRM partnerships would be needed is contingent on whether the Authority is able to lead development of its own on-site PRM project for the realignment of Visitacion Creek. If the Visitacion Creek/Bay resiliency mitigation concept is implemented by the Authority, there would be a reduced need to identify off-site PRM with the identified partners.

PRM sites would be protected by easement and managed in perpetuity under agreements with third-party land owners and managers. Third-party managers may include mitigation or conservation banking firms or local or regional conservation organizations such as the Midpeninsula Regional Open Space District or the South Bay Salt Pond Restoration Program. The Authority has not yet identified or proposed any PRM sites for compensatory mitigation purposes. Each of these potential sites would need to be evaluated for its suitability to satisfy the range of agency needs.

PRM projects would be informed by available and applicable watershed plans. Within the San Francisco Bay watershed, a few key watershed plans have been developed addressing tidal and subtidal areas. These plans include:

- San Francisco Bay Plan (BCDC 2019)
- San Francisco Bay Subtidal Habitat Goals Report (California State Coastal Conservancy 2010)

- Baylands Ecosystem Habitat Goals Report (California State Coastal Conservancy 2000)
- Baylands Ecosystem Habitat Goals Science Update 2015 (California State Coastal Conservancy 2015)

While not a watershed plan, the 2007 Final Environmental Impact Statement/Report for the South Bay Salt Pond Restoration Project (Final EIS/EIR) may serve as guidance for the potential scope of restoration activities associated with the South Bay Salt Pond Restoration Project, the largest tidal wetland restoration project on the West Coast (U.S. Fish and Wildlife Service [USFWS] and California Department of Fish and Game 2007). The Final EIS/EIR, together with the ongoing work conducted for the South Bay Salt Pond Restoration Project, may provide guidance and opportunities for compensatory mitigation for some aquatic features that may be affected by the project.

Within the Coyote HUC-8 watershed, key watershed plans include:

- The Santa Clara Valley Habitat Plan (County of Santa Clara et al. 2012)
- The Santa Clara Valley Greenprint (Santa Clara Valley Open Space Authority 2014)
- The One Water Plan (under development by the Santa Clara Valley Water District [2019]).

2.7 Conclusion

The combination of on-site PRM, off-site PRM, and mitigation bank credit purchase options presented in Chapter 2, Waters of the United States, would be more than sufficient to mitigate the project's impacts. Approximately 55 percent of all impacts on wetland and nonwetland aquatic features associated with the project (which are conservatively estimated) are located at the East Brisbane LMF site, including all of the scrub/shrub wetland, constructed basin, and open water features. The proposed Visitacion Creek/Bay resiliency mitigation concept (Appendix B) could be designed to replace all or almost all affected features on-site. This would reduce the need for off-site PRM and could also potentially reduce or negate the need to purchase wetland mitigation credits. Of the impacts not associated with the LMF site, approximately 67 percent are associated with constructed watercourses, which are planned to be replaced on-site. Remaining impacts, estimated to be under 2 acres, could be addressed through off-site PRM projects with one or more of the identified partner agencies. Therefore, the implementation of the Visitacion Creek/Bay resiliency mitigation concept together with on-site restoration for constructed watercourses and smaller-scale wetland and nonwetland off-site PRM projects would be sufficient to mitigate the project's impacts.

3 FEDERALLY LISTED SPECIES

Because of the limited amount of land available for on-site mitigation in the HSR right-of-way, off-site compensatory mitigation would be the primary mechanism for offsetting impacts to listed species. Off-site mitigation would likely include a combination of mitigation/conservation banks and PRM.

All compensatory mitigation for listed species would be subject to USFWS or National Marine Fisheries Service (NMFS) approval. Based on a specified combination of these approved projects and programs, the mitigation acreages required to offset this project's impacts would be determined in collaboration with USFWS and NMFS.⁸

For all proposed compensatory mitigation, the Authority would establish appropriate management and monitoring plans for each mitigation site. Funding would be secured for initial habitat restoration, if applicable, and long-term monitoring and management.

3.1 Overview of Laws and Regulations

3.1.1 Federal Endangered Species Act of 1973 (16 U.S.C. § 1531 et seq.)

The FESA and subsequent amendments provide guidance for conserving federally listed species and the ecosystems upon which they depend. Section 7 requires federal agencies to consult with USFWS or NMFS to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of threatened or endangered fish, wildlife, or plant species, or result in the destruction or adverse modification of designated critical habitat for any such species. As part of the consultation, USFWS and NMFS would issue biological opinions (BO) and incidental take statements for fish and wildlife species to exempt the Section 9 take prohibition.

3.1.2 Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 et seq.)

The amended Magnuson-Stevens Fishery Conservation and Management Act is also known as the Sustainable Fisheries Act (Public Law 104-297). It requires that all federal agencies consult with the NMFS on activities authorized, funded, or undertaken by the federal agency that may adversely affect essential fish habitat for commercially managed marine and anadromous fish species.

3.1.3 U.S. Fish and Wildlife Coordination Act (16 U.S.C. §§ 661–666c)

The U.S. Fish and Wildlife Coordination Act applies to any federal project where any waterbody is impounded, diverted, deepened, or otherwise modified. Project proponents are required to consult with the USFWS and the appropriate state wildlife agency.

3.2 Estimated Impacts on Federally Listed Species Habitat and Designated Critical Habitat

3.2.1 Estimated Impacts on Federally Listed Species Habitat

Species impacts were estimated by intersecting spatially explicit species habitat models and the project footprint using GIS software. The methods for estimating impacts on listed species are described in Chapter 4, Methods for Evaluating Effects, of the *San Francisco to San Jose Project Section Biological and Aquatic Resources Technical Report* (Authority 2020a). Table 3 presents the direct construction impacts on federally listed species habitat. Like aquatic resources, it is conservatively assumed that all species habitat within the project footprint would be affected.

⁸ Although San Francisco garter snake is listed as endangered under both FESA and the California Endangered Species Act (CESA), it is also designated as fully protected under California Fish and Game Code. Because the California Department of Fish and Wildlife (CDFW) is not authorized to issue an incidental take permit under Section 2081(b) of the CESA for fully protected species, this pCMP does not address compensatory mitigation under CESA (no other state-listed species would be affected by the project).

Actual impacts are anticipated to be much less because of opportunities for avoidance provided by design refinements and construction planning, and determination of species presence or absence through pre-construction surveys.

Table 3 Estimated Impacts on Federally Listed Species Habitat (acres)

Species	Permanent	Temporary	Total
Plants			
California seablite	1.7	0.0	1.7
Fish and Wildlife			
Central California coast steelhead	0.2	0.0	0.2
California red-legged frog			
<i>Aquatic habitat</i>	2.1	0.2	2.3
<i>Refugia/foraging habitat</i>	6.0	0.1	6.1
Total	8.1	0.3	8.4
San Francisco garter snake			
<i>Aquatic habitat</i>	0.5	0.1	0.6
<i>Refugia/foraging habitat</i>	6.0	0.1	6.1
Total	6.5	0.2	6.7

3.2.2 Estimated Impacts on Designated Critical Habitat

San Francisquito Creek (San Mateo to Palo Alto Subsection) and Stevens Creek (Mountain View to Santa Clara Subsection) are both included in the Santa Clara Hydrologic Unit (Unit 2205) of designated critical habitat for central California coast steelhead (70 *Federal Register* 52488). Both streams support known steelhead runs (Leidy et al. 2005) and flow west to east across the project footprint. The project footprint does not overlap with any other designated critical habitat units.

The project footprint at both stream crossings is limited to the blended HSR and Caltrain right-of-way and is approximately 0.48 acre at San Francisquito Creek and 0.13 acre at Stevens Creek. Construction and operations activities at these locations may involve removal or trimming of riparian trees that provide stream shading, which moderates water temperatures conducive for steelhead movement and steelhead food sources (e.g., leaves and arboreal invertebrates that fall into the water). Any riparian vegetation management activities would result in the temporary degradation of aquatic habitat during construction and reduced value for some period of time after construction is completed and until riparian vegetation is restored. No direct impacts on aquatic habitat are expected because no in-water construction or culvert replacement is proposed at either location.

3.3 Confirmation of Impacts

In coordination with USFWS or NMFS, the estimates for impacts would be adjusted during project construction to determine the amount of compensatory mitigation required. Adjustments to impact estimates would occur in the following circumstances:

- Impacts on habitat are reduced or increased as a result of changes in project design
- Pre-construction site assessments indicate that habitat features are absent (e.g., because of errors in land cover mapping or land cover conversion)

- The habitat is determined to be unoccupied based on negative species surveys

All areas of temporary and permanent loss of habitat for listed species would be documented in compliance reporting. This documentation would include GIS data layers, associated metadata, and photodocumentation of areas of habitat loss for each species. For each species, a cumulative acreage of habitat loss would be presented in a table.

3.4 Compensatory Mitigation Strategy

Compensatory mitigation is proposed for the following listed species with moderate to high potential to occur within the RSA—California seablite, steelhead (central California coast distinct population segment), San Francisco garter snake, and California red-legged frog.

Mitigation for species affected by the project may be provided by preserving habitat, restoring or enhancing and preserving habitat, restoring or enhancing habitat on land that has already been preserved (“additionality”), or reducing environmental stressors other than habitat loss or degradation that threaten the species. These mitigation actions may be implemented through conservation banks, ILF programs, or PRM projects.

The primary approach proposed for mitigating impacts on federally listed species focuses on the preservation and long-term protection of habitat, supplemented by habitat restoration and enhancement. This habitat would be preserved at PRM sites and at conservation banks, where credits would be purchased. The secondary approach would be to prioritize the preservation and enhancement of sites that make proportionately greater contributions to regional conservation needs as described in Section 2.4. These are larger sites that expand existing preserved areas, contribute to regional connectivity of core habitat areas, or that have been identified as a conservation priority by local and regional conservation organizations and agencies.

For a PRM site to be suitable for use as mitigation, the site would generally meet both of the following criteria:

- Suitability of the site as habitat for the species based on the determination of a qualified biologist or of the USFWS or NMFS
- Likely species’ use of the site as determined by one or more of the following:
 - Documented observation of the species
 - Proximity to a documented observation of the species (e.g., an occurrence reported in the California Natural Diversity Database)
 - Site-specific protection requirements in an existing conservation strategy or recovery plan.

It may be challenging to ascertain occupancy for some species at a given site because of population fluctuations, difficulty of detection, or infrequency of species occurrence in the RSA. In these instances, a mitigation site may be selected based only on the presence of suitable habitat.

A major consideration in the selection of sites is their use as mitigation for multiple species. The use of sites suitable for multiple species would reduce the total acreage of land required as mitigation. Moreover, such sites tend to be more diverse, of greater importance for regional conservation efforts, or both.

The planned amount of compensatory mitigation would be based on a conservative (i.e., high) estimate of the project’s direct, permanent impacts on habitat potentially suitable for each species. These estimates are provided in Section 3.2, Estimated Impacts on Federally Listed Species Habitat and Designated Critical Habitat.

As described in Section 3.3, Confirmation of Impacts, these estimates would be confirmed and adjusted as appropriate during implementation to determine the amount of compensatory mitigation that is commensurate with the actual impacts. Adjustments would be based on pre-construction site assessments, and in some cases surveys for particular species in the project’s footprint. This adjustment process is necessary because the project’s pre-permit impact estimates

are based on limited access to only a small portion of the project footprint, some changes in land cover/land use would likely occur prior to construction, and some revisions to the project footprint would likely occur as a result of the design/build process.

3.5 Identification of Mitigation Options

3.5.1 Identification Methodology

Consistent with the regulatory and resource agency priorities and policies described in this pCMP, this pCMP utilizes a watershed approach to identify mitigation sites exhibiting high conservation values as well as opportunities to restore, enhance, establish, and preserve aquatic resources and listed species habitats. Analysts followed the following steps:

1. Identified types of potential impacts by resource type and location (Section 3.2 describes the estimated impacts on listed species).
2. Evaluated conservation banks and ILF programs with service areas overlapping the RSA. RIBITS and USFWS's conservation bank website (USFWS 2018) were used to identify potential conservation banks with available credits for species needing mitigation.
3. Considered conceptual mitigation approaches for on-site restoration near the East Brisbane LMF. Analysts conducted a preliminary evaluation of whether the proposed concept could potentially provide species mitigation.
4. Identified potential properties, programs, and partners that could provide compensatory mitigation for those impacts on listed species that could not be met through a conservation bank. Analysts reviewed applicable watershed plans and identified local agencies currently undertaking conservation activities for the potentially affected species. Analysts then contacted the identified local agencies to gauge level of interest and opportunity for a possible partnership for species mitigation activities. This PRM would likely include a combination of turnkey projects, restoration and enhancement activities on conserved lands, or other types of partnerships with local and regional conservation organizations.

With the exception of four conservation banks (described in Section 3.5.2.2, Conservation Banks) that are not in the same watersheds as the project, the proposed compensatory mitigation options described in this pCMP meet the watershed approach to mitigation site selection.

3.5.2 Identified Options for Compensatory Mitigation

3.5.2.1 *In-Lieu Fee Programs*

There are no ILF programs with service areas overlapping the RSA. Therefore, use of an ILF program is not proposed.

3.5.2.2 *Conservation Banks*

Conservation banks that have potential to provide compensatory mitigation are shown in Table 4. A detailed RIBITS report of the available credits, by habitat type, is presented in Appendix C, Regulatory In-Lieu Fee and Bank Information Tracking System Report. All of the banks summarized in Table 4 have service areas that overlap with all or a portion of the affected acres. However, none of the banks are within the RSA; the county within which the bank occurs is provided in Table 4 to provide some geographic context to bank location. Credit availability information is included in Appendix C based on a review of RIBITS (accessed on April 30, 2019) and may not reflect credit availability at the time credits are purchased. Of the species affected by the project, these conservation banks only provide credit for California red-legged frog. Credits are not currently available for any of the other species.

Table 4 Conservation Banks with Potential to Provide Compensatory Mitigation for Species

Conservation Bank	Species	Approving Agency	County Where the Bank is Located
North Bay Highlands Conservation Bank	California red-legged frog	USFWS	Marin
Ohlone West Conservation Bank	California red-legged frog	USFWS, CDFW ¹	Alameda
Oursan Ridge Conservation Bank	California red-legged frog	USFWS, CDFW ¹	Contra Costa
Ridge Top Ranch Wildlife Conservation Bank	California red-legged frog	USFWS	Solano

Source: USACE 2019

USFWS = U.S. Fish and Wildlife Service

CDFW = California Department of Fish and Wildlife

¹ California red-legged frog is not state listed. CDFW approved this bank for certain state-listed species.

3.5.2.3 Permittee-Responsible Mitigation Sites

Mitigation needs that are not met by on-site compensatory mitigation or through conservation banks would require additional PRM. Off-site PRM opportunities in the HUC-8 watersheds affected by the project could include projects developed through a partnership with one or more of the open space or parkland management agencies in the region, or through financial contributions to ongoing restoration efforts. PRM opportunities for species mitigation are shown in Table 5.

Table 5 Potential Partnerships that Could Provide Permittee-Responsible Mitigation

Potential PRM Partner	County	Listed Species Likely to Benefit from PRM Projects	Mitigation Action under Consideration
Midpeninsula Regional Open Space District	San Mateo, Santa Clara	Central California coast steelhead, California red-legged frog, San Francisco garter snake	Protection, restoration, and enhancement
Peninsula Open Space District	San Mateo, Santa Clara	Central California coast steelhead, California red-legged frog	Protection, restoration, and enhancement
San Francisquito Creek Joint Powers Authority	Santa Clara	Central California coast steelhead	Restoration and enhancement
South Bay Salt Ponds Restoration Program	San Mateo, Santa Clara	California seablite	Restoration and enhancement
San Mateo Resource Conservation District	San Mateo	Central California coast steelhead, California red-legged frog, San Francisco garter snake	Restoration and enhancement

Sources: Andersen 2019; Barton 2020; Halsing 2019; Issel 2019; Murray 2019

PRM = permittee-responsible mitigation

PRM projects would be informed by applicable species recovery or conservation plans. Recovery plans for potentially affected species include:

- *Coastal Multispecies Recovery Plan for California Coastal Chinook Salmon, Northern California Steelhead, Central California Coast Steelhead* (NMFS 2016)
- *Recovery Plan for the California Red-Legged Frog (Rana aurora draytonii)* (USFWS 2002)

- *Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California* (USFWS 2013) (includes California seablite)
- *Recovery Plan for the San Francisco Garter Snake* (*Thamnophis sirtalis tetrataenia*) (USFWS 1985)

Within the Coyote watershed, the Santa Clara Valley Habitat Plan addresses conservation of California red-legged frog (County of Santa Clara et al. 2012).

3.5.3 Summary of Identified Options by Species

Table 6 shows the identified compensatory mitigation options by affected species.

Table 6 Summary of Applicable Compensatory Mitigation Options by Species

Species	Conservation Banks				Permittee-Responsible Mitigation					
	North Bay Highlands Conservation Bank	Ohlone West Conservation Bank	Oursan Ridge Conservation Bank	Ridge Top Ranch Wildlife Conservation Bank	Visitacion Creek /Bay Resiliency Mitigation Concept	San Francisco Creek Joint Powers Authority	Midpeninsula Regional Open Space District	Peninsula Open Space District	South Bay Salt Pond Restoration Project	San Mateo Resource Conservation District
California seablite					X ¹				X ²	
Central California coast steelhead						X	X	X		X
California red-legged frog	X	X	X	X		X	X	X		X
San Francisco garter snake							X			X ³

¹ The ability to mitigate for California seablite at this site will depend on tidal ecotone restoration being a component of the project, and will be based on further evaluation of site suitability.

² The South Bay Salt Ponds Restoration Project has not conducted restoration for this species. However, due to the extensive restoration work being completed, and due to the successful re-introduction of this species in other areas around San Francisco Bay, it may be possible to collaborate with this restoration effort to implement a new California seablite restoration project.

³ The San Mateo Resource Conservation District primarily works on the coast side of the peninsula, although they have conducted work for steelhead on the San Francisco Bay side.

3.6 Evaluation of Mitigation Options

3.6.1 Methodology

For each mitigation type—conservation bank or PRM opportunity—each option was evaluated against the mitigation need. When an option was determined appropriate to offset the impact, the mitigation burden was reduced by the known or estimated acreage.

For conservation banks, if the impact location was within the bank's service area, credits were assumed applicable. For PRM opportunities, existing information was used to identify mitigation options.

3.6.2 Mitigation Options

This section provides an assessment of mitigation options by species (see Table 2).

California seablite. Conservation bank credits are not available for this species. It is estimated that 1.7 acres of California seablite habitat would be affected by this project. However, it is unlikely that this species would be encountered during construction. California seablite is believed to have been extirpated from central and south San Francisco Bay, and the only three known local populations were created north of the project site. If required, mitigation may be possible as part of the potential Visitacion Creek/Bay resiliency mitigation concept or off-site PRM in partnership with South Bay Salt Pond Restoration Project. The South Bay Salt Pond Restoration Project has not previously completed restoration for this species, so undertaking such a project would be a new activity for that program. However, because of the successful re-introduction of this species in other areas around San Francisco Bay it may be possible to collaborate with the South Bay Salt Pond Restoration Project to implement a new California seablite restoration project.

Central California coast steelhead. Conservation bank credits are not available for this species. Estimated impacts on central California coast steelhead habitat are relatively small (0.2 acre) and are associated with watercourse (stream) crossings throughout the project area. Mitigation could potentially be implemented on-site at crossings where targeted habitat improvement opportunities are available and could be realized with minor project design changes. If after implementing on-site improvements, additional mitigation is still needed, four potential PRM partners have been identified that have experience implementing restoration projects for steelhead habitat. As such, it is likely that a single off-site PRM project could address any remaining mitigation needs for this species.

California red-legged frog. Based on the impact analysis, it is conservatively estimated that mitigation needs for California red-legged frog would be in the range of 4.2 to 8.4 acres of aquatic habitat, and 12 to 24 acres of refugia/foraging habitat (assuming 2:1 to 4:1 mitigation ratios for permanent impacts). Sufficient conservation bank credits are available for this species but all of the available banks are not only outside of the HUC-8 watershed in which the impacts would occur, but also outside the county. Therefore, a higher mitigation ratio may be necessary than if mitigation occurred closer to the impacts.

California red-legged frog shares suitable habitat characteristics with San Francisco garter snake, for which no conservation bank credits are available. Because the Authority would likely need to undertake multiple PRM projects for San Francisco garter snake mitigation, and because the mitigation needs of these two species are of similar scale, it may be efficient and cost-effective to work with one of the two potential PRM partners with experience in both California red-legged frog and San Francisco garter snake restoration and enhancement projects to implement projects that would meet the mitigation needs of both species, negating the need to purchase mitigation credits for California red-legged frog.

San Francisco garter snake. Conservation bank credits are not available for this species. Two potential partners for PRM projects are identified in Table 5. While the San Mateo Resource Conservation District (RCD) works primarily on the coastal side of San Mateo County and outside of the affected HUC-8 watersheds, USFWS staff recommended working with the San Mateo RCD to identify potential mitigation opportunities, as the RCD has significant experience in conducting restoration and enhancement for this species. In addition, much of the remaining potential habitat and sites with restoration or enhancement potential for this species are located on the coastal side of the county. Therefore, it is expected that mitigation outside of the affected HUC-8 watersheds would be approved by USFWS.

Based on the impact analysis, it is conservatively estimated that mitigation needs for San Francisco garter snake would be in the range of 1.0 to 2.0 acres of aquatic habitat, and 12 to 24 acres of refugia/foraging habitat (assuming 2:1 to 4:1 mitigation ratios for permanent impacts). California red-legged frog shares suitable habitat characteristics with San Francisco garter snake, and implementing mitigation projects for these species together may be efficient and cost-

effective. The San Mateo RCD in particular has partnered on mitigation projects for public agencies, and has indicated that doing a project for both species is possible (Issel 2019).

3.6.3 Summary of Preferred Approach by Species

This section summarizes the preferred approach for mitigation options by species. The recommendation is based on this pCMP's prioritizing procedure balanced with ease and relative likelihood of success in implementation. Table 7 shows a brief summary, by species, of the preferred approach to meeting mitigation obligations. The preferred approach may change as the project planning advances, impacts are refined, and discussions with USFWS or NMFS proceed.

Table 7 Preferred Approach to Meeting Compensatory Mitigation Goals for Species

Species and Affected Geography	Preliminary Priority Mitigation Options	Rationale for Preferred Approach
California seablite	PRM partnership	Conservation bank credits are not available for this species. The preferred approach to mitigation is on-site restoration at Visitacion Creek that incorporates habitat for this species and uses translocation to establish a new population. The next best option would be to partner with the South Bay Salt Pond Restoration Project to identify a project conserving this species that needs funding.
Central California coast steelhead	PRM partnership	Conservation bank credits are not available for this species. The preferred approach is to develop a PRM project with Midpen, POST, the San Mateo RCD, or San Francisquito Creek Joint Powers Authority. Each of these organizations currently manage stream habitat for this species and could likely partner with the Authority to develop and implement a habitat restoration or enhancement project.
California red-legged frog	PRM partnership; conservation bank	The preferred approach is to partner with Midpen or the San Mateo RCD to identify and design a PRM project that would mitigate impacts to both California red-legged frog and San Francisco garter snake. If this is not acceptable to USFWS, the next best approach would be to purchase credits from a conservation bank. However, the available conservation banks are located outside of the HUC-8 and the county.
San Francisco garter snake	PRM partnership	Conservation bank credits are not available for this species. The preferred approach is to partner with Midpen or the San Mateo RCD to identify and design a PRM project that would mitigate impacts to both San Francisco garter snake and California red-legged frog. These agencies own or manage occupied habitat, and have indicated that implementing a mitigation project in partnership with the Authority is a possibility.

Midpen = Midpeninsula Regional Open Space District

POST = Peninsula Open Space District

PRM = permittee-responsible mitigation

RCD = Resource Conservation District

3.7 Opportunities to Co-Locate Species Mitigation and Aquatic Resources Mitigation

Both the proposed on-site PRM for Visitacion Creek and possible PRM partnerships provide opportunities to co-locate some species and aquatic resource mitigation. The potential Visitacion

Creek/Bay resiliency mitigation concept could potentially provide mitigation for natural and constructed watercourse, saline emergent wetland, scrub/shrub wetland, and California seablite. A partnership with the Midpeninsula Regional Open Space District, Peninsula Open Space District, San Mateo RCD, or the San Francisquito Creek Joint Powers Authority could potentially provide mitigation for natural and constructed watercourse, scrub/shrub wetland, steelhead, San Francisco garter snake, and California red-legged frog. If sufficient opportunities for San Francisco garter snake and California red-legged frog mitigation are not available in the affected HUC-8 watershed, mitigation for these species could be provided outside of the affected HUC-8 watershed.

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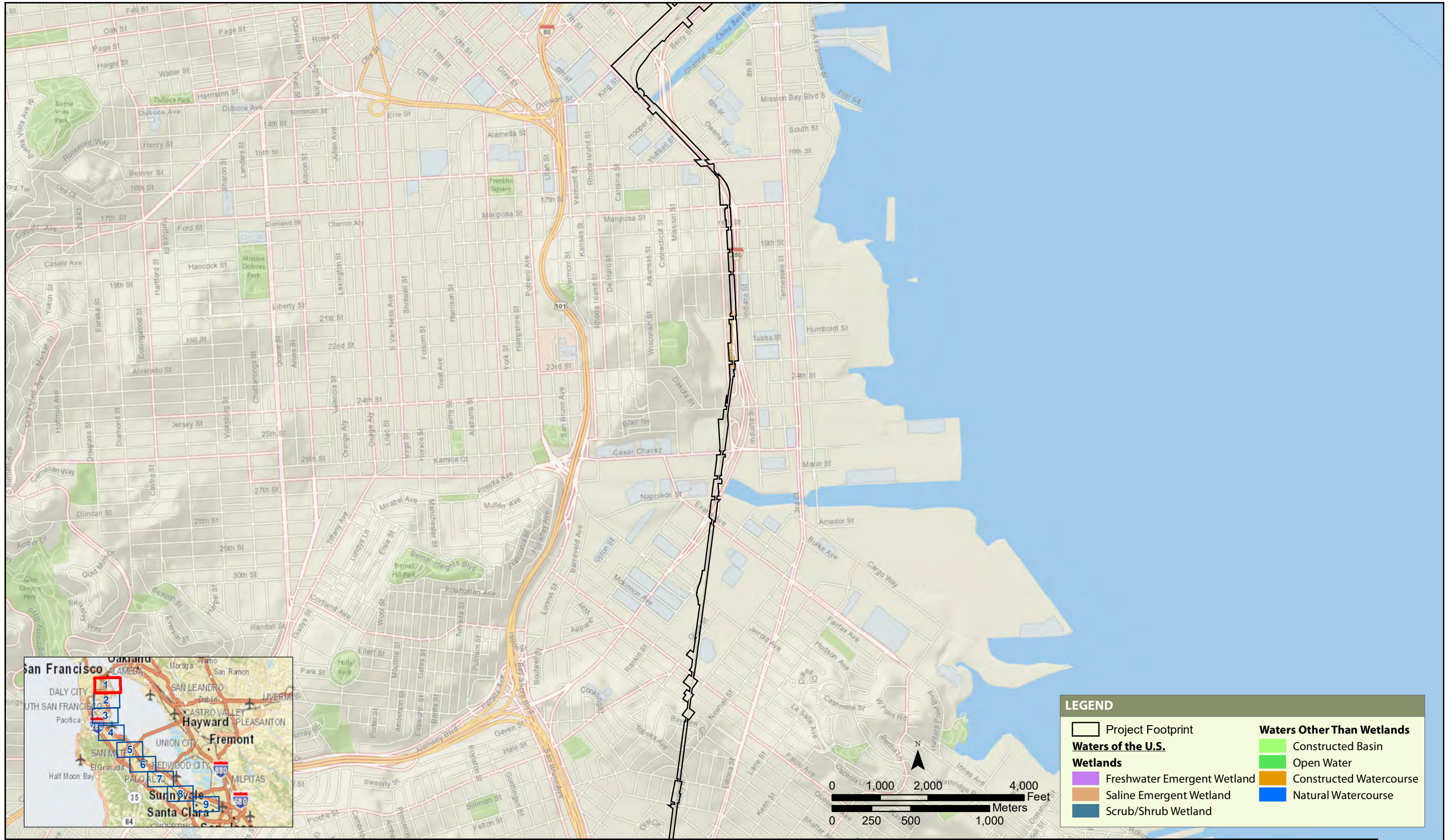
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APPENDIX A IMPACTS ON WATERS OF THE U.S. MAPS



Source: Basemap, National Geographic ESRI 2017



Source: Basemap, National Geographic ESRI 2017

MAY 2019

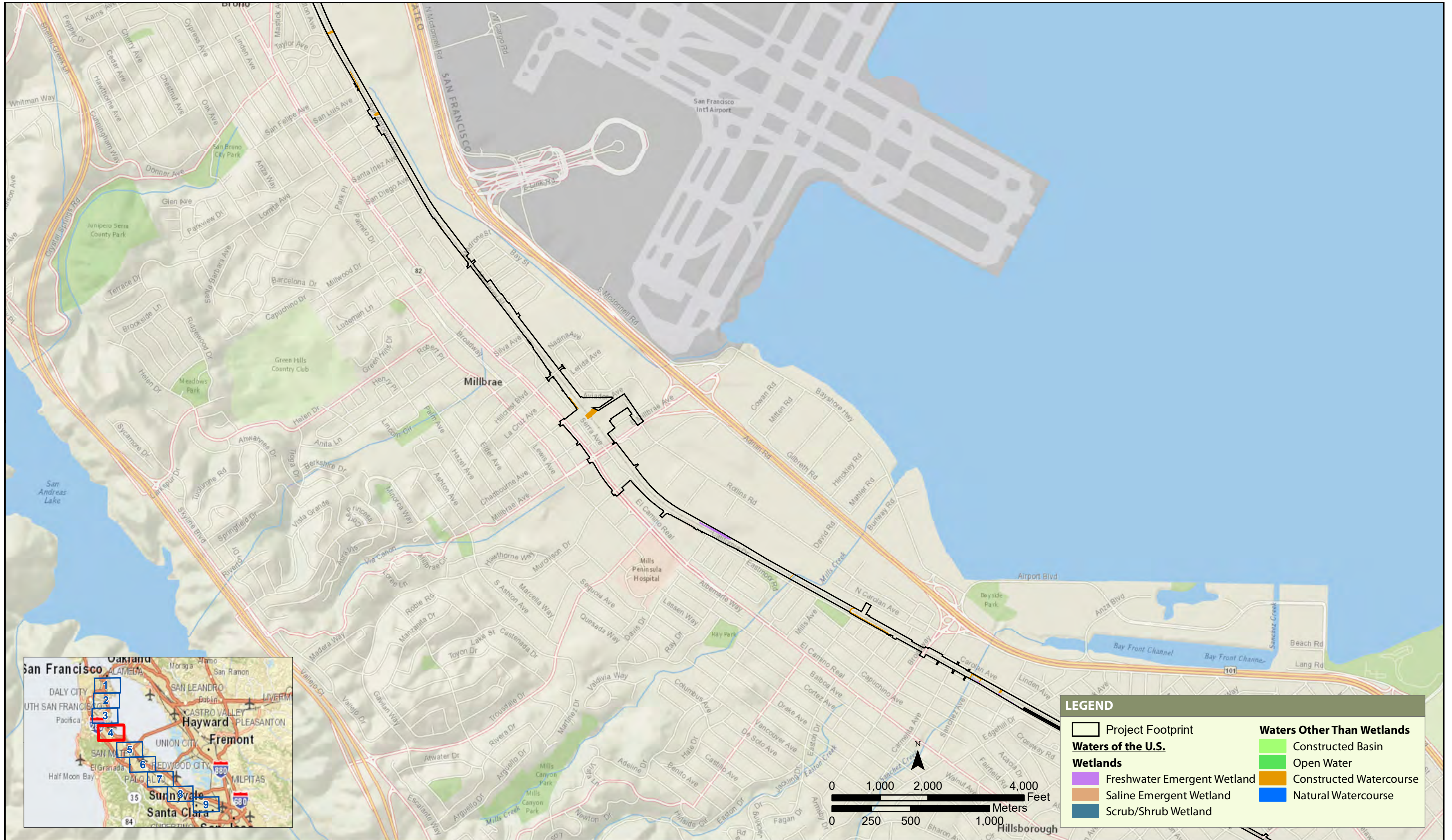
Impacts on Waters of the U.S.



Source: Basemap, National Geographic ESRI 2017

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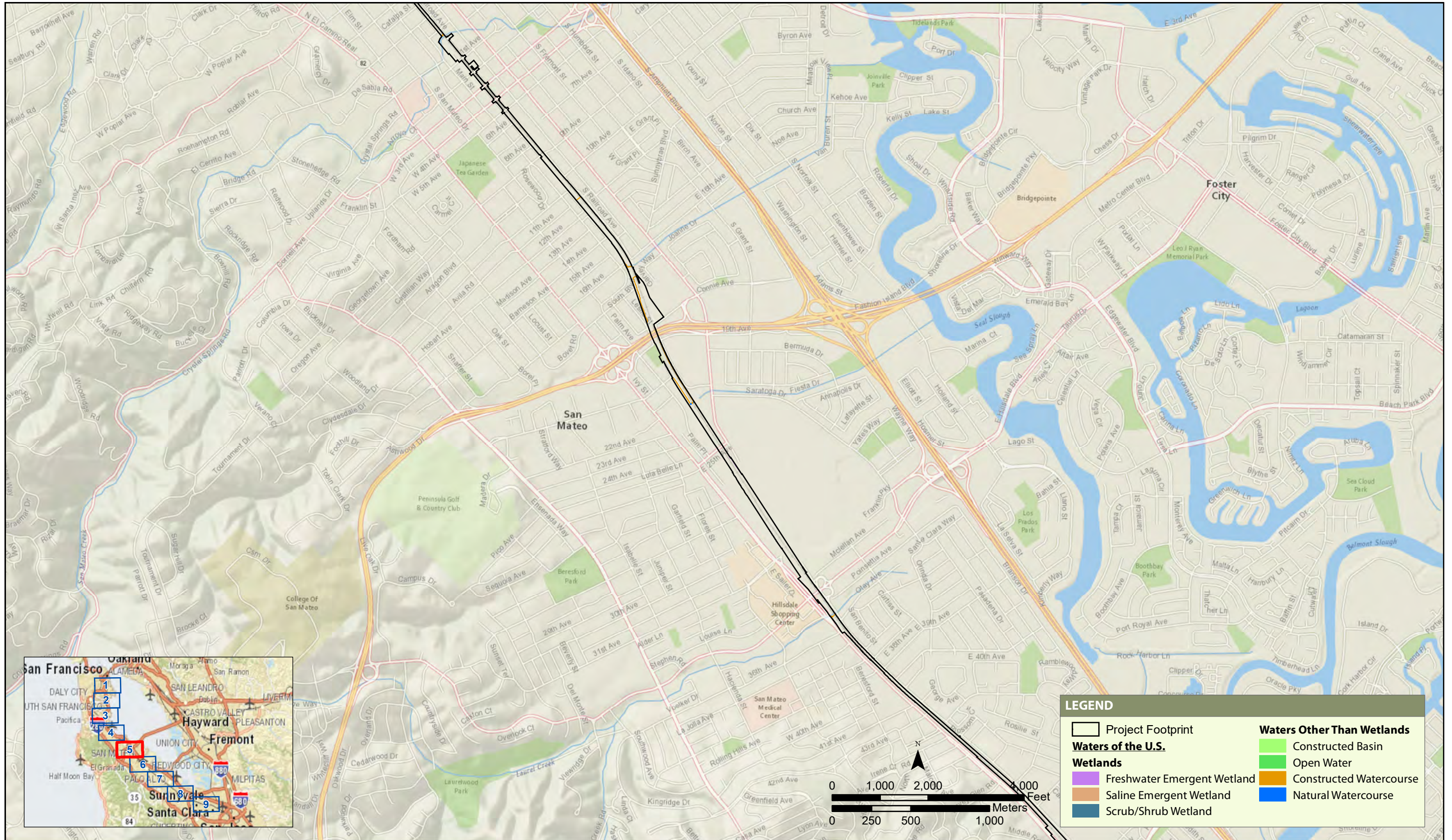
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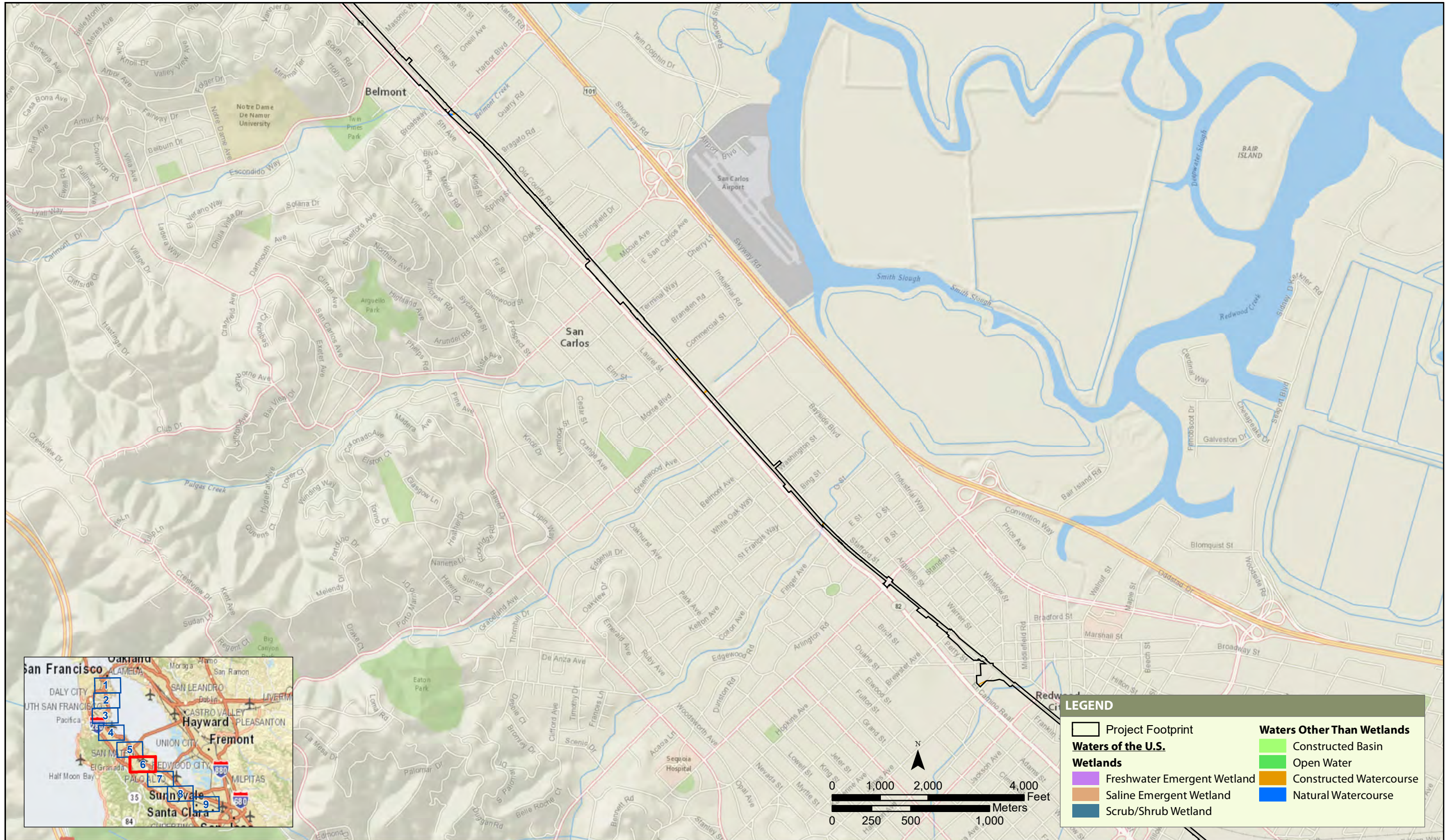
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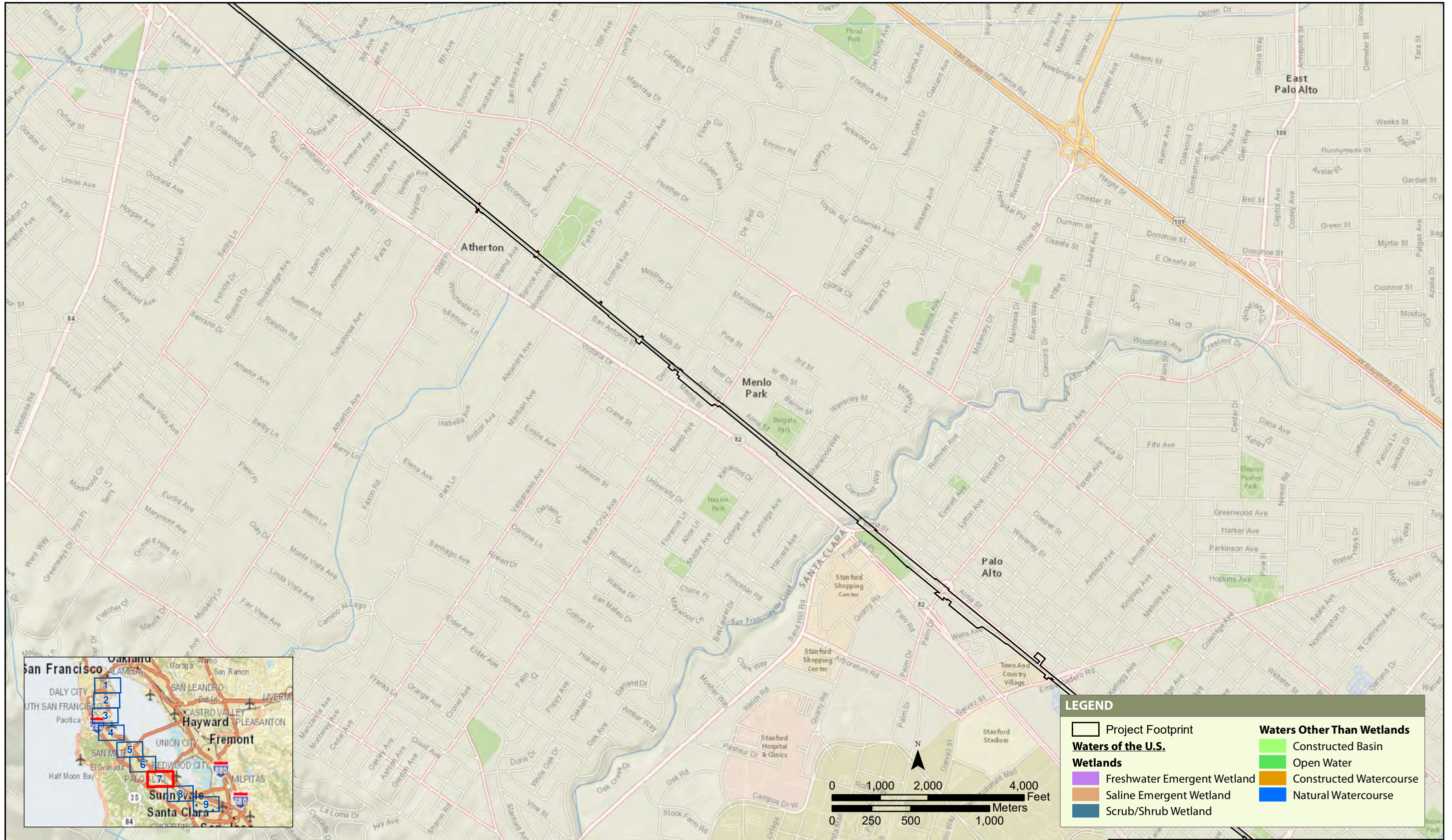
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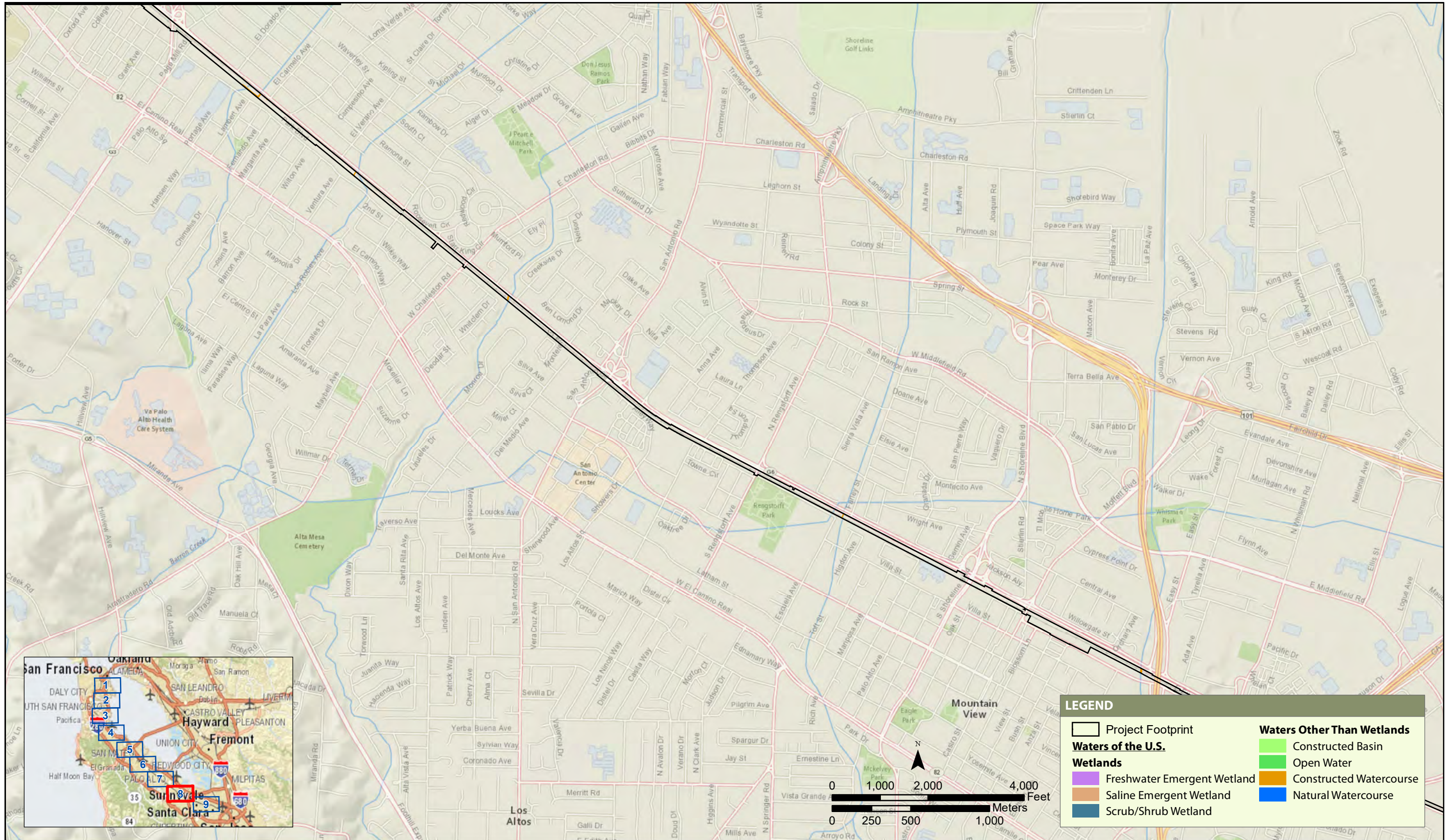
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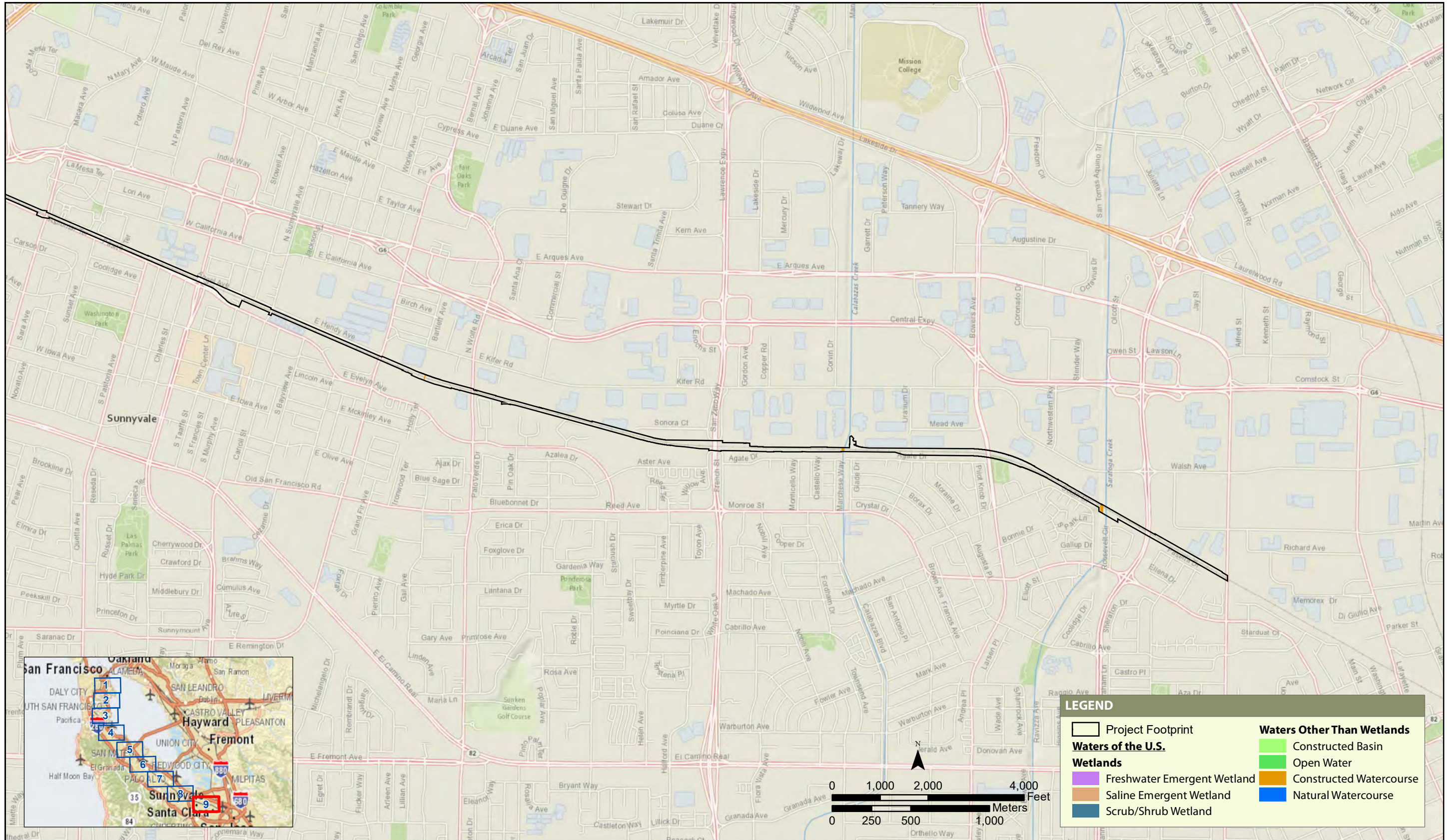
Impacts on Waters of the U.S.



Source: Basemap, National Geographic ESRI 2017

MAY 2019

Impacts on Waters of the U.S.



Source: Basemap, National Geographic ESRI 2017

MAY 2019

Impacts on Waters of the U.S.

APPENDIX B POTENTIAL VISITACION CREEK/BAY RESILIENCY MITIGATION CONCEPT

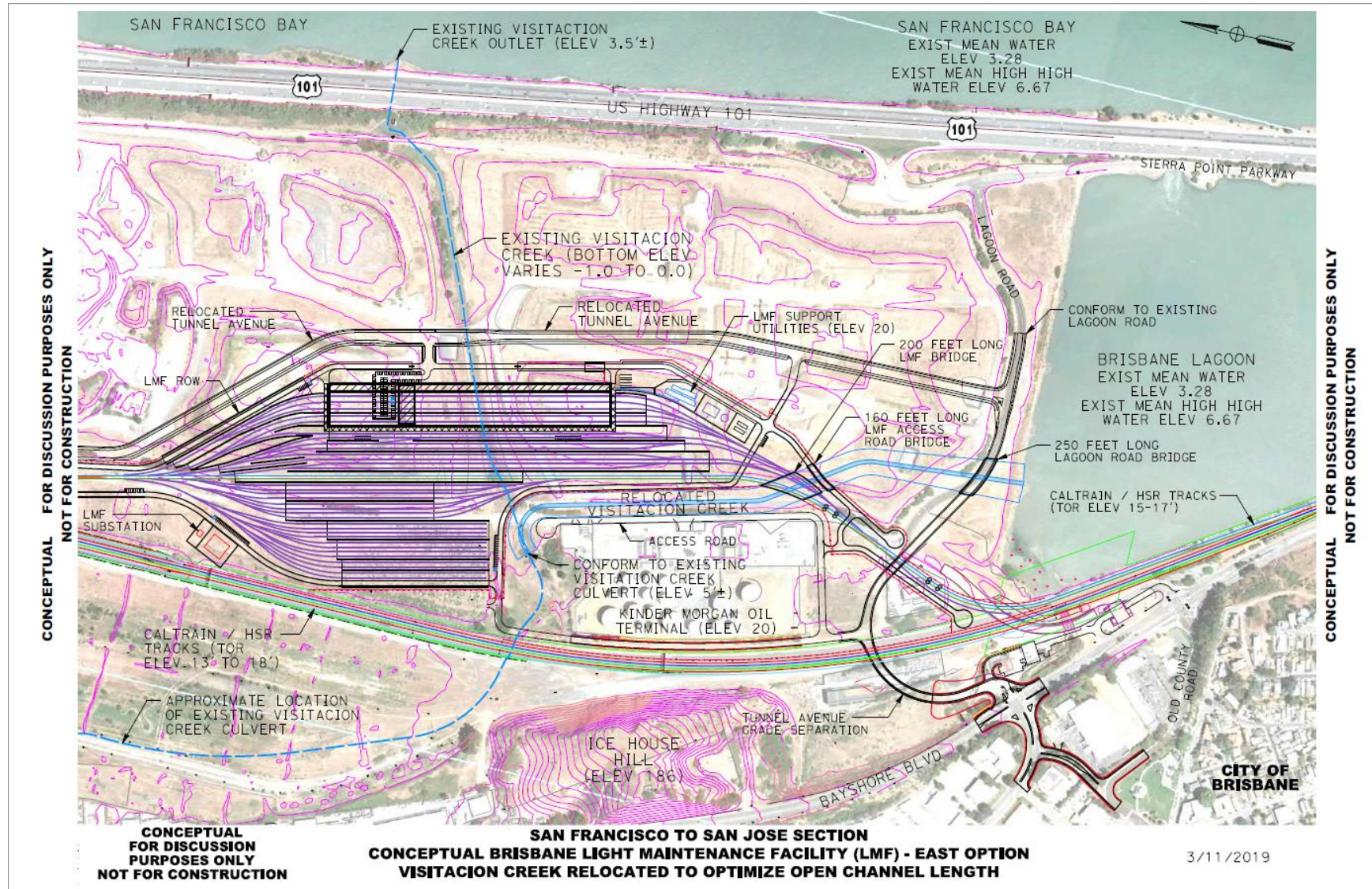
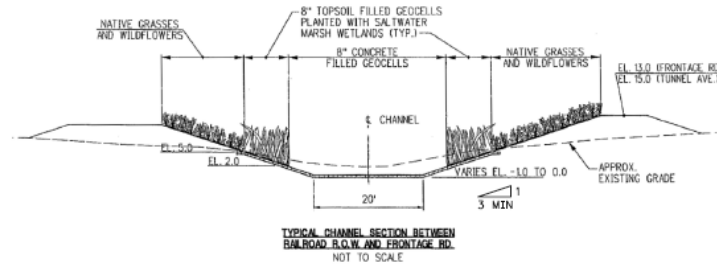


Exhibit 1 Visitation Creek/Bay Resiliency Mitigation Concept

CONCEPTUAL FOR DISCUSSION PURPOSES ONLY NOT FOR CONSTRUCTION

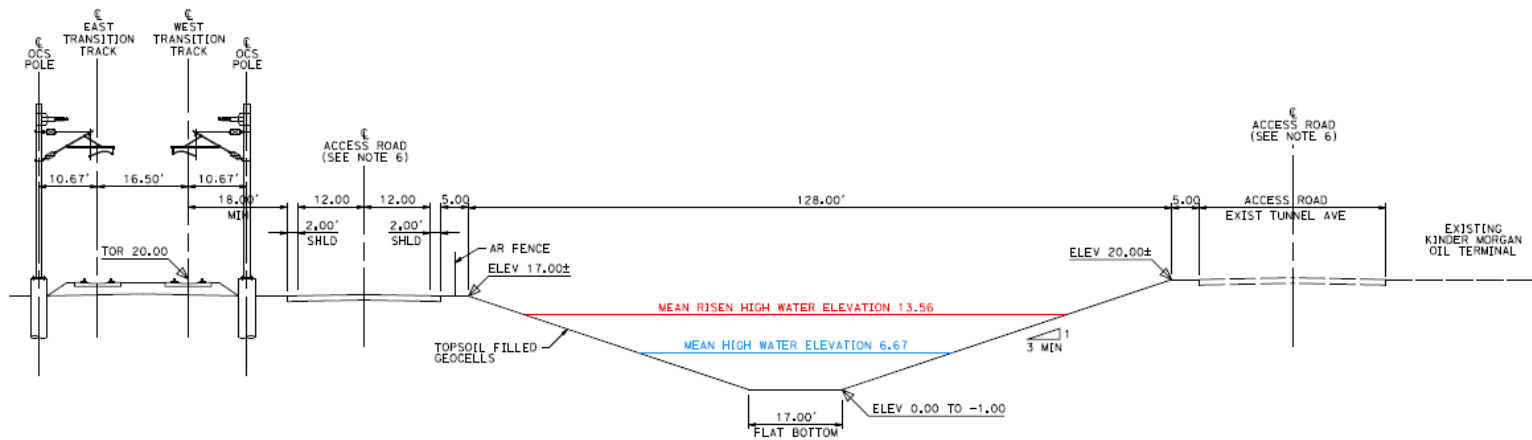


CONCEPTUAL FOR DISCUSSION PURPOSES ONLY NOT FOR CONSTRUCTION

TYPICAL SECTION EXISTING VISITACION CREEK

SOURCE: CITY OF BRISBANE BAYLANDS SPECIFIC PLAN AND INFRASTRUCTURE PLAN APPENDIX P - FEBRUARY 2011

CONCEPTUAL FOR DISCUSSION PURPOSES ONLY NOT FOR CONSTRUCTION



TYPICAL SECTION RELOCATED VISITACION CREEK BETWEEN LMF AND KINDER MORGAN

3/01/2019

Exhibit 2 Typical Sections of Visitation Creek

APPENDIX C REGULATORY IN-LIEU FEE AND BANK INFORMATION TRACKING SYSTEM REPORT

Table 1 Conservation Banks within the Study Area with Potential to Provide Compensatory Mitigation

Conservation Bank	Type in RIBITS	Available Credits	HUC 8 Watershed
North Bay Highlands Conservation Bank	California red-legged frog	110.29	San Pablo Bay (18050002)
Ohlone West Conservation Bank	Group: CTS-B (State)/CTS (Fed)/CRF-Pond	0.20	San Francisco Bay (18050004)
Ohlone West Conservation Bank	Group: CTS (Fed)/CRF-Pond habitat	0.44	San Francisco Bay (18050004)
Ohlone West Conservation Bank	Group: CTS (Fed)/CRF/AWS (Fed)	0.00	San Francisco Bay (18050004)
Ohlone West Conservation Bank	Group: CTS (Fed)/CTS-U (State)/CRF/AWS (Fed)/AWS (State)/CSB	27.30	San Francisco Bay (18050004)
Ohlone West Conservation Bank	Group: CTS (Fed)/CRF/AWS(Fed)/AWS (State)	151.25	San Francisco Bay (18050004)
Ohlone West Conservation Bank	Group: CTS (Fed)/CRF/AWS (Fed)/AWS (State)/CSB	77.19	San Francisco Bay (18050004)
Ohlone West Conservation Bank	Group: CTS (Fed)/CTS-U (State)/CRF/AWS (Fed)/CSB	172.15	San Francisco Bay (18050004)
Ohlone West Conservation Bank	Group: CTS (Fed)/CRF/AWS (Fed)/CSB	0.00	San Francisco Bay (18050004)
Oursan Ridge Conservation Bank	California red-legged frog	0.66	San Pablo Bay (18050002)
Oursan Ridge Conservation Bank	Group: CRF/AWS	100.61	San Pablo Bay (18050002)
Ridge Top Ranch Wildlife Conservation Bank	California red-legged frog	7.7	Suisun Bay (18050001)
Ridge Top Ranch Wildlife Conservation Bank	Group: Frog/Butterfly	62.59	Suisun Bay (18050001)

Source: USACE 2019

RIBITS = Regulatory In-lieu Fee and Bank Information Tracking System

HUC = hydrologic unit code

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